

# POWER MANAGEMENT PRODUCT SELECTION GUIDE



Volume 4

International  
**IOR** Rectifier

THE POWER MANAGEMENT LEADER

**THE POWER BEHIND ENERGY SAVINGS**

Next-Generation Solutions for Today's Design Challenges

Whether you're powering the world's next-generation processors, driving towards more fuel efficient vehicles, taking high reliability to new heights or squeezing more efficiency out of appliances, IR's power management solutions extend performance and conserve energy.

As power management grows ever more complex, IR's complement of benchmark architectures, silicon and packaging deliver to our customers the defining power management technology their product roadmaps demand.



For more information, go to [www.irf.com](http://www.irf.com).

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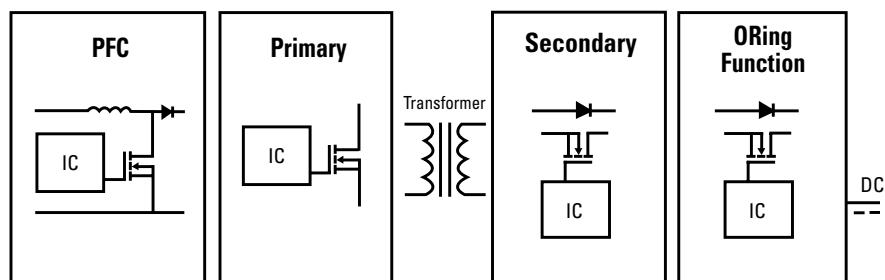
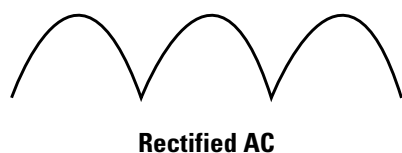


# SOLUTIONS BY APPLICATION





## AC-DC SYSTEMS



## POWER FACTOR CORRECTION

- IR's PFC Controllers utilize the proprietary One Cycle Control™ scheme which does not require input AC line sensing, reducing component count and circuit complexity. These controllers are used in continuous conduction mode boost PFC and implement average current mode control for low THD and improved noise immunity. This same PFC functionality is also integrated into some controllers for various applications such as lighting and motor control.
- PFC / Boost IGBTs - are optimized with low switching losses for operation at high frequency up to 60kHz. Discrete IGBTs without a free-wheeling diode are also suitable for this application.

### PFC Control ICs

Part Number	Description
IR1152	Fixed 66KHz switching frequency with brownout protection and dual OVP protection
IR1153	Fixed 22KHz switching frequency with brownout protection and programmable OVP protection
IR1155	Programmable switching frequency and programmable OVP protection

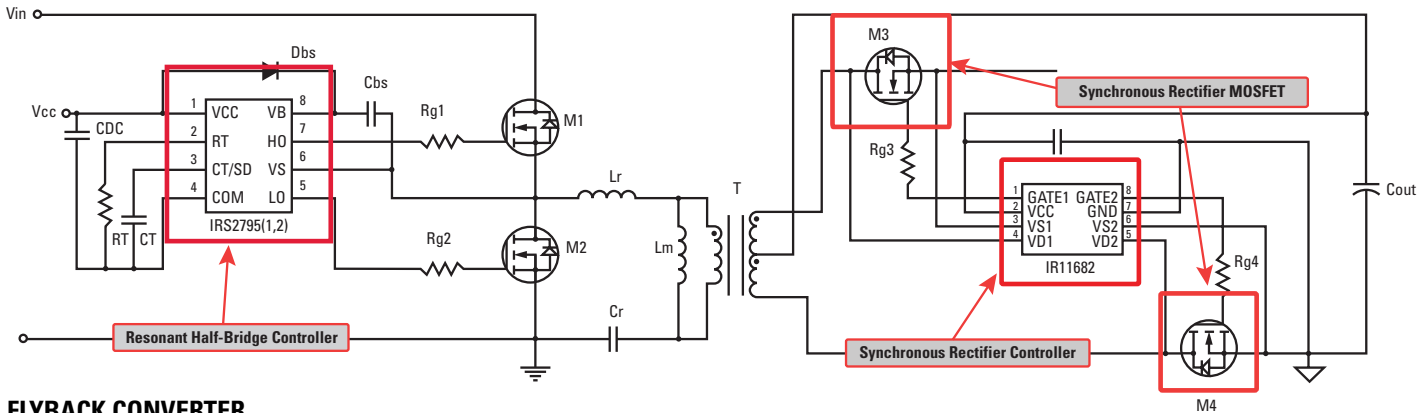
### PFC / Boost IGBTs

Part Number	$V_{CES}$ (V)	Circuit	$I_c$ @ 100C (A)	$V_{CE(on)}$ (max) (V)	Package
IRGB20B60PD1	600	Co-Pack	22	2.35	TO-220AB
IRGP20B60PD			22	2.35	TO-247AC
IRGP35B60PD			35	2.15	TO-247AC
IRGP50B60PD1			45	2.35	TO-247AC
IRG4(B/IB)C20W		Discrete	6.5	2.6	D2-Pak; TO-220AB; TO-220 FullPak
IRG4(B/IB/P)C30W			12	2.7	D2-Pak; TO-220AB; TO-220 FullPak; TO-247AC
IRG4(B/P)C40W			20	2.5	TO-262; D2-Pak; TO-220AB; TO-247AC
IRG4PC50W			27	2.3	TO-247AC
IRGP4069			35	1.85	TO-247AC
IRGP4063			48	2.14	TO-247AC
IRG4PF50W	900		28	2.7	TO-247AC

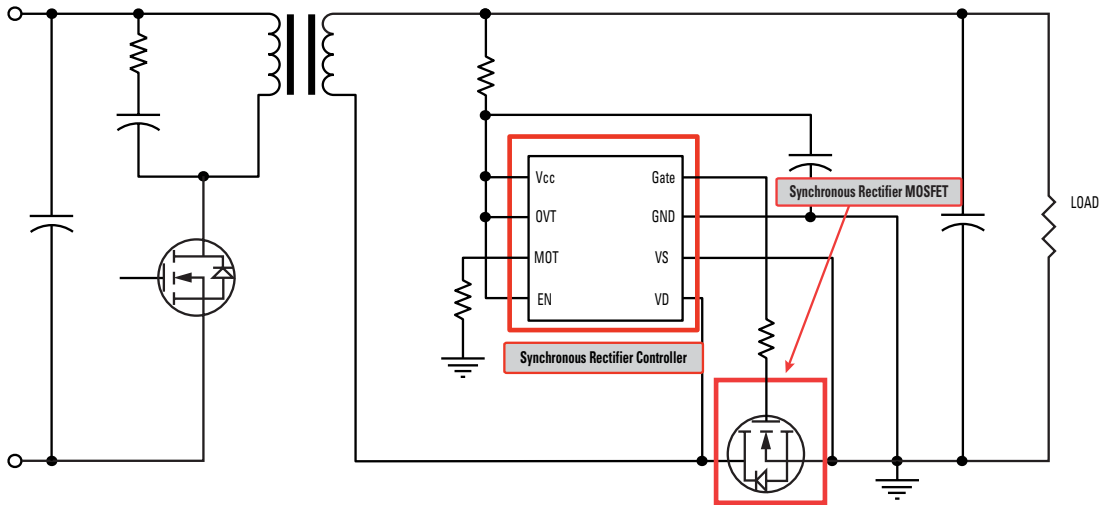
Coming in 2011

# SOLUTIONS BY APPLICATION | AC-DC

## RESONANT HALF-BRIDGE



## FLYBACK CONVERTER



- IR's Resonant half-bridge controllers enable compact design by providing a fully functional controller in an SO-8 package.
- IR's SmartRectifier™ ICs offer simple high efficiency solutions for secondary synchronous rectification.

### Resonant Half-Bridge Control ICs

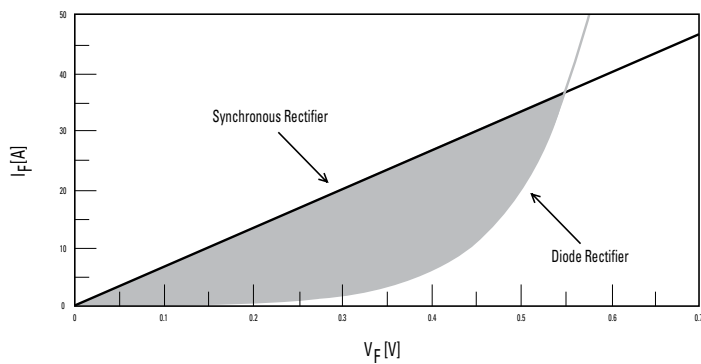
Part Number	Package	$V_{OFFSET}$ (V)	$I_{O+}$ & $I_{O-}$ (mA)	Programmable Frequency (kHz)	Programmable Dead-time (ns)	OCP Threshold(V)
IRS27951S	SO-8	600	300/900	25-500	200-1800	2
IRS27952S	SO-8	600	300/900	25-500	200-1800	3

### Synchronous Rectification Control ICs

Part Number	Package	$V_{CC}$ max (V)	$V_{FET}$ max (V)	Sw Freq. max (kHz)	Gate Drive (A)	$V_{GATE}$ clamp (V)	Min. On Time (ns)	Enable Pin	Channel	Automatic MOT Protection
IR1166S	SO-8	20	200	500	+1/-4	10.7	Program. 250-3000	Yes	1	No
IR11662S					+1/-4	10.7		Yes		Yes
IR1167AS					+2/-7	10.7		Yes		No
IR11672AS					+2/-7	10.7		Yes		Yes
IR1168S					+1/-4	10.7	750	No	2	No
IR11682S	+1/-4	10.7	850	No	2	Yes				



## SYNCHRONOUS RECTIFICATION MOSFETs



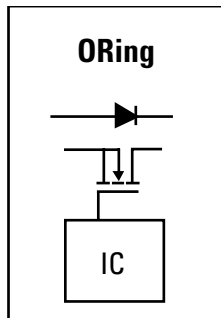
Synchronous rectification improves conversion efficiency because the MOSFET can operate below the knee of a diode offering lower conduction losses.

- Key parameters
- Low  $R_{DS(on)}$
- Low output capacitance
- Low package inductance

Voltage	$R_{DS(on)}$ max (mOhm)	Medium-Can (6.3 x 4.9mm)	PQFN 5x6	D <sup>2</sup> -Pak	D <sup>2</sup> -Pak 7pin	S08	T0-220	T0-262
30	1.4		IRFH5000					
	1.8	IRF6627M						
	2.4			IRF2903ZS			IRF2903Z	
	3.2					IRF7862		
40	1.25				IRFS3004-7P			
	1.75			IRFS3004			IRFB3004	IRFSL3004
	2.6		IRFH5004					
	3.6	IRF6613		IRF2204S			IRF2204	IRF2204L
	5	IRF6616				IRF7842		
55	2.6				IRF3805S-7P			
	3.3			IRF3805S			IRF3805	IRF3805L
60	2.1				IRFS3006-7P			
	2.5			IRFS3006			IRFB3006	IRFSL3006
	4.2		IRFH5006	IRFS3306			IRFB3306	IRFSL3306
	7	IRF6648						
	9.4					IRF7855		
75	2.6				IRFS3107-7P			
	3			IRFS3107				IRFSL3107
	3.3						IRFB3077	
	5.8		IRFH5007	IRFS3307z			IRFB3307z	IRFSL3307z
80	10	IRF6646						
	13.4					IRF7854		
100	4				IRFS4010-7P			
	4.7			IRFS4010			IRFB4110	IRFSL4010
	9		IRFH5010	IRFS4410z			IRFB4410Z	IRFSL4410Z
	14	IRF6644		IRFS4610			IRFB4610	IRFSL4610
	18			IRF3710ZS		IRF7853	IRF3710Z	IRF3710ZL
150	12			IRFS4115	IRFS4115-7P		IRFB4115	IRFSL4115
	31		IRFH5015					
	34.5	IRF6643						
200	22			IRFS4127			IRFB4127	IRFSL4127

# SOLUTIONS BY APPLICATION | AC-DC

## ACTIVE ORING



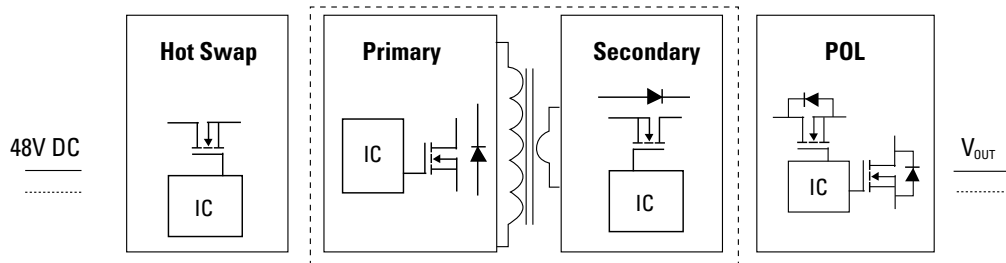
- Active ORing combines two or more power sources to create a redundant power source, preserving the input power supply in case one of the input sources fails. In the event of an input power failure, the Active ORing circuit disconnects the non-functioning power source as quickly as possible to prevent the system bus voltage from falling, and prevents large peak reverse currents.
- Active ORing MOSFETs – have low conduction losses

### Active ORing Control IC

Part Number	$V_{in}$ (V)	$V_{CC}$	FET Turn-Delay	FET Turn-Off Time	UVLO $V_{CC(on)}$	FET Check Status	Turn-Off Gate Drive	Package
IR5001S	5V - 100V	15V max.	130nS typ.	20nS typ.	8.3V to 10.9V	Yes	3A	SO-8

### Active ORing MOSFETS

Voltage	$R_{DS(on)}$ max (mOhm)	Medium-Can (6.3 x 4.9mm)	PQFN 5x6	D <sup>2</sup> -Pak	D <sup>2</sup> -Pak 7pin	S08	TO-220	TO-262
30	1.4		IRFH5000					
	1.8	IRF6627M						
	2.4			IRF2903ZS			IRF2903Z	
	3.2				IRFS4010-7P	IRF7862		
100	4							
	4.7			IRFS4010			IRFB4110	IRFSL4010
	9		IRFH5010	IRFS4410Z			IRFB4410Z	IRFSL4410Z
	14	IRF6644		IRFS4610			IRFB4610	IRFSL4610
	18			IRF3710ZS		IRF7853	IRF3710Z	IRF3710ZL



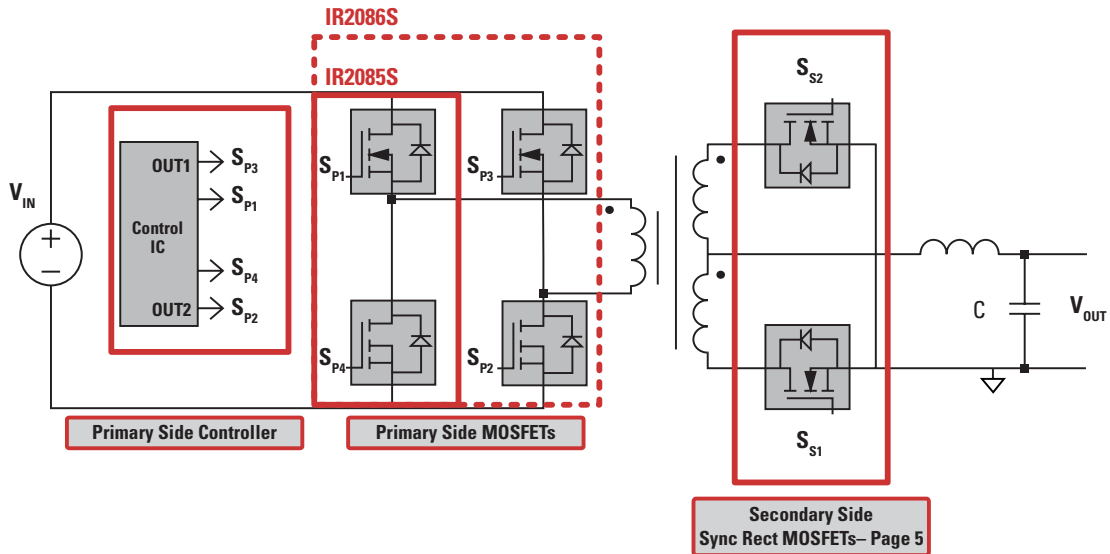
### Hot Swap MOSFETS

Part Number	Voltage	Package	$R_{DS(on)}$ max. @ 10VGS
IRF1607	75	TO-220AB	7.5
IRFP2907	75	TO-247AC	4.5
IRF8010	100	TO-220AB	15
IRFB52N15D	150	TO-220AB	32

### KEY FEATURES

- Linear mode capable for bus charging
- Low  $R_{DS(on)}$

## ISOLATED DC-DC CONVERTER



### Primary Side Controllers

Part Number	Description
IR2085S	High Speed 100V Self Oscillating 50% Duty Cycle Half Bridge Driver in a 8-Lead SOIC package
IR2086S	High Speed 100V Self Oscillating 50% Duty Cycle Full Bridge High and Low Side Driver in a 16-lead SOIC package

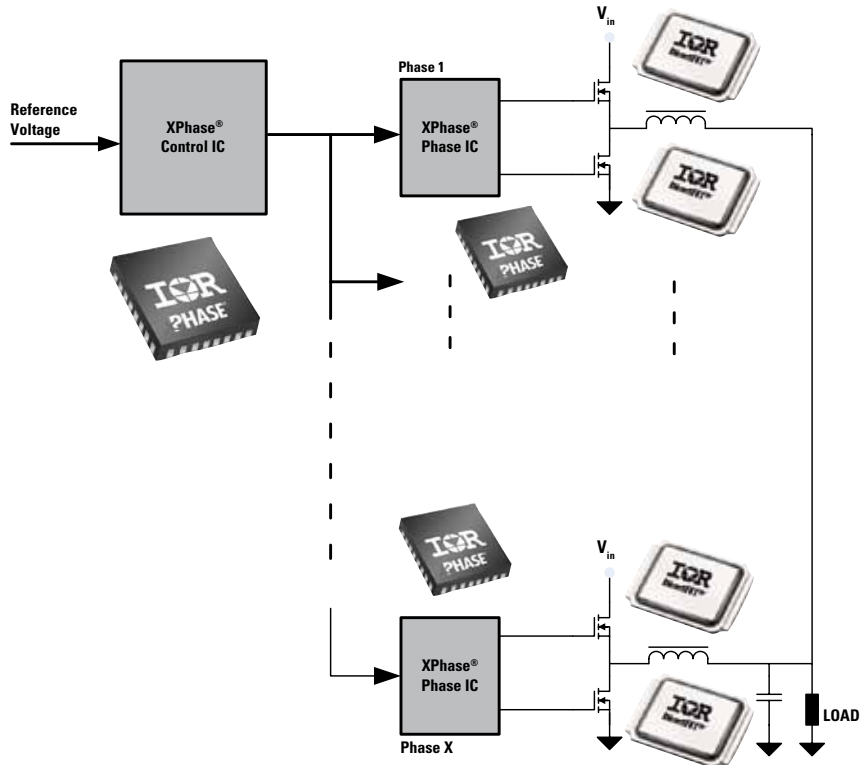
- Primary side MOSFETs are switched at high frequency and require a balance of low conduction and low switching losses.

### Primary Side MOSFETs

Voltage	$R_{DS(on)max}$ (mOhm)	Medium-Can (6.3 x 4.9mm)	PQFN 5x6	D <sup>2</sup> -Pak	D <sup>2</sup> -Pak 7pin	S08	T0-220	T0-262
55	2.6			IRF3805S-7P				
	3.3			IRF3805S			IRF3805	IRF3805L
60	2.1			IRFS3006-7P			IRF2903Z	
	2.5			IRFS3006			IRFB3006	IRFSL3006
	4.2		IRFH5006	IRFS3306			IRFB3306	IRFSL3306
	7	IRF6648						
	9.4						IRF7855	
75	2.6				IRFS3107-7P			
	3			IRFS3107				IRFSL3107
	3.3						IRFB3077	
	5.8		IRFH5007	IRFS3307Z			IRFB3307Z	IRFSL3307Z
80	10	IRF6646						
	13.4						IRF7854	
100	4				IRFS4010-7P			
	4.7			IRFS4010			IRFB4110	IRFSL4010
	9		IRFH5010	IRFS4410Z			IRFB4410Z	IRFSL4410Z
	14	IRF6644		IRFS4610			IRFB4610	IRFSL4610
	18			IRF3710ZS			IRF7853	IRF3710Z

# SOLUTIONS BY APPLICATION | DC-DC

## MULTI-PHASE DC-DC CONVERSION FOR HIGH DENSITY APPLICATIONS



### DirectFET® Power MOSFETS

Part Number	Function	DirectFET® Outline	$V_{DS}$ (max)	$V_{GS}$ (max)	$R_{DS(on)}$ @ 10V (max)	$R_{DS(on)}$ @ 4.5V (max)	$Q_g$ @ (typ)
IRF6711S	Control FET	SQ	25 V	20 V	3.8 mΩ	6.5 mΩ	4.4 nC
IRF6794M	Sync FET	MX	25 V	20 V	1.7 mΩ	3 mΩ	11 nC
IRF6798M	Sync FET	MX	25 V	20 V	1.3 mΩ	2.1 mΩ	16 nC

### XPhase® Phase ICs

Part Number	Package	PSI Capable	Switching Frequency	$V_{CC}$ (max)
IR3529M	20L 4x4 MLPQ	Yes	250 kHz - 1.5 MHz	7.5 V
IR3505ZM	16L 3x3 MLPQ	Yes	250 kHz - 1.5 MHz	8 V
IR3507ZM	20L 4x4 MLPQ	Yes	250 kHz - 1.5 MHz	8 V

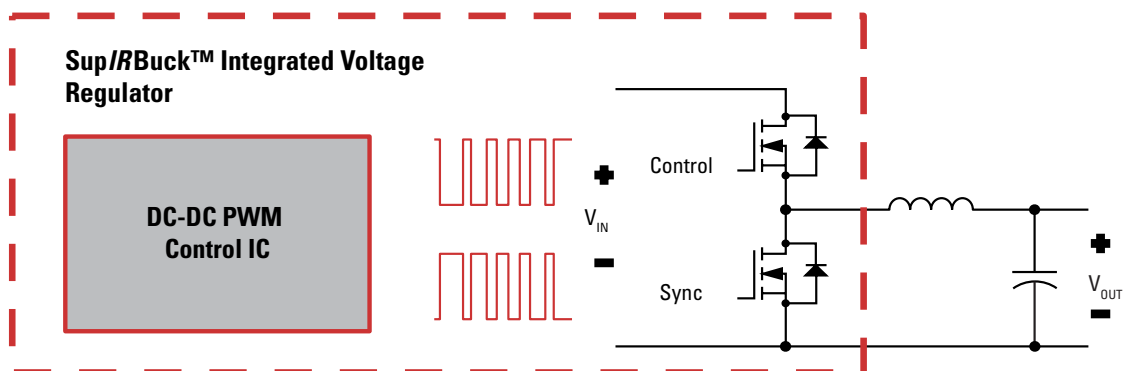
### XPhase® Control ICs

Part Number	Package	PSI Capable	Processor Type	Accuracy
IR3503M	32L 5x5 MLPQ	Yes	Intel VR11 and VR11.1	0.5%
IR3521M	32L 5x5 MLPQ	Yes	AMD VDD & VDDNB	0.5%
IR3513M	32L 5x5 MLPQ	No	POL Platforms	0.5%

### BENEFITS:

- High Power Density
- Design Flexibility
- Dual-Sided Cooling with DirectFET®

## MULTI-PHASE DC-DC CONVERSION FOR HIGH DENSITY APPLICATIONS



### Gen 2.1 Sup/IRBuck™ Product Offering

14A			IR3837	
12A	IR3840W			
10A			IR3838	<b>NEW 4x5 mm package</b>
9A				IR3859
8A	IR3841W	IR3831W		IR3856
6A			IR3839	IR3853
4A	IR3842W	IR3832W		
2A	IR3843W			
INPUT BIAS		5V	12V single rail	5V
DDR TRACKING	N	Y	Y	N
$V_{IN}$		1.5 – 16V		1.5 – 21V

### COMMON FEATURES

- Maximum switching frequency of 1.5 MHz
- Vref accuracy of +/- 1%
- Enable
- Programmable switching frequency
- PGood
- Pre-bias protection
- Thermal protection
- Programmable hiccup current limit
- Programmable over current



Sup/IRBuck™ Online Design Tool featuring parametric search, schematic capture, AC, Steady State, Transient Analysis, Thermal Analysis, BOM creation, and more...

[mypower.irf.com/Sup/IRBuck](http://mypower.irf.com/Sup/IRBuck)

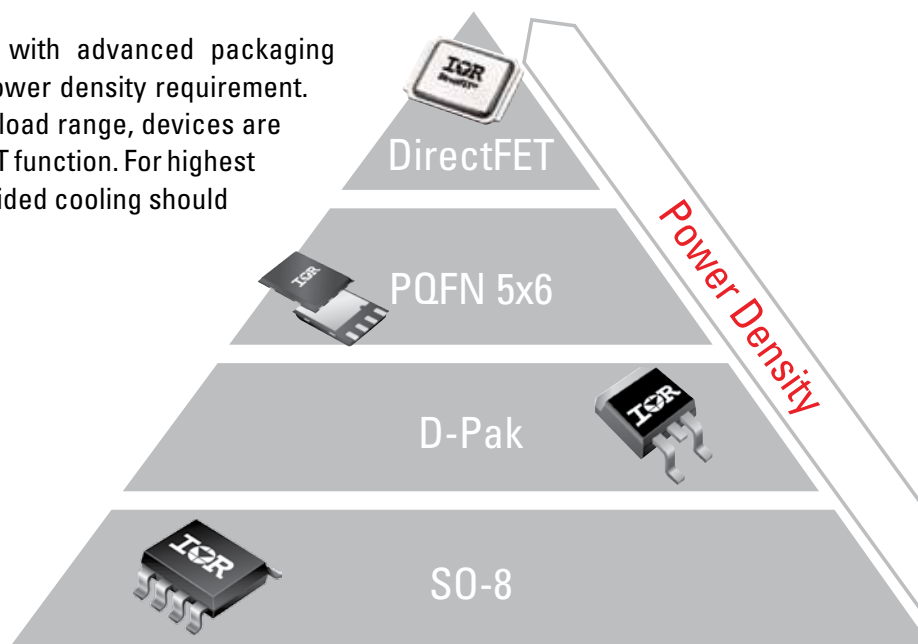
# SOLUTIONS BY APPLICATION | DC-DC

## DISCRETE POINT OF LOAD SOLUTIONS

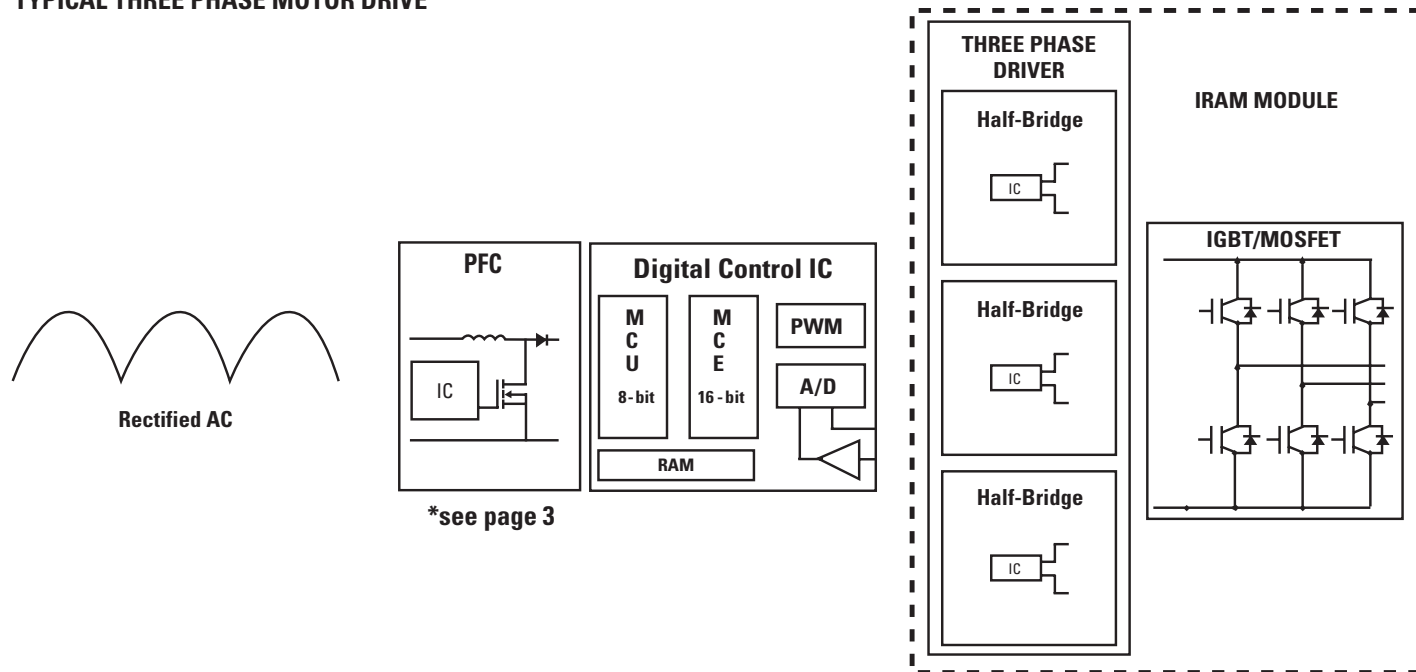
PWM Control ICs						
Part Number	Package	V <sub>IN</sub> Range (V)	V <sub>DD</sub> Range (V)	V <sub>OUT</sub> Range (V)	Switching Frequency (kHz)	Target Application
IR3640M	20L 3x4 MLPQ	1.5 - 24	4.5 - 5.5	0.7 - 0.9*VIN	250 - 1500	Server, Netcom, Storage
IR3629AM	12L 3x4 MLPQ	(V <sub>OUT</sub> + 5) to 28	4.5 - 14	0.6 - 0.8*VIN	300	Gaming, STB, Computing
IR3629M	12L 3x4 MLPQ	(V <sub>OUT</sub> + 5) to 28	4.5 - 14	0.6 - 0.7*VIN	600	Gaming, STB, Computing
IR3710M	16L 3x3 MLPQ	3 - 28	3.3 & 5	0.5 - 12	100 - 1000	Notebook, Consumer
IR3651M	SOIC-14	12 - 100	4.5 - 13.2	1.25 - 0.7*VIN	100 - 400	Industrial, Consumer

Typical Sync Buck MOSFET Pairs						
Part Number	Package	Function	BV <sub>DSS</sub> (V)	R <sub>DS(on)</sub> max V <sub>GS</sub> =10V (mOhm)	Q <sub>g</sub> Typ. V <sub>GS</sub> =4.5V (nC)	
IRF6721S	DirectFET® SQ	Control	30	7.3	11	
IRF6725M	DirectFET® MX	Sync	30	2.2	28	
IRFH5306	Performance PQFN 5 x 6	Control	30	8.1	7.8	
IRFH5302	Performance PQFN 5 x 6	Sync	30	2.1	29	
IRFH7921	PQFN 5 x 6	Control	30	8.5	9.3	
IRFH7934	PQFN 5 x 6	Sync	30	3.5	20	
IRLR8729	D-Pak	Control	30	8.9	10	
IRLR8726	D-Pak	Sync	30	5.8	15	
IRF8721	SO-8	Control	30	8.5	8.3	
IRF8734	SO-8	Sync	30	3.5	20	
IRF8513	Half-Bridge Asymmetric SO-8	Control	30	15.5	5.7	
		Sync		12.7	7.6	

IR's MOSFET technologies coupled with advanced packaging capability enable solutions for any power density requirement. For optimal efficiency over the entire load range, devices are optimized for either Sync or Control FET function. For highest power density, DirectFET® with dual-sided cooling should be used.



## TYPICAL THREE PHASE MOTOR DRIVE



- IR's *iMOTION*<sup>™</sup> Integrated Design Platform delivers everything you need to design a complete variable speed motor control subsystem. From the front panel and power entry to the motor terminals, *iMOTION*<sup>™</sup> brings powerful digital, analog and power silicon together with algorithms, development software and design tools.
- IRAM Integrated Power Modules offer gate drive, power switches, and protection circuitry in one compact package.

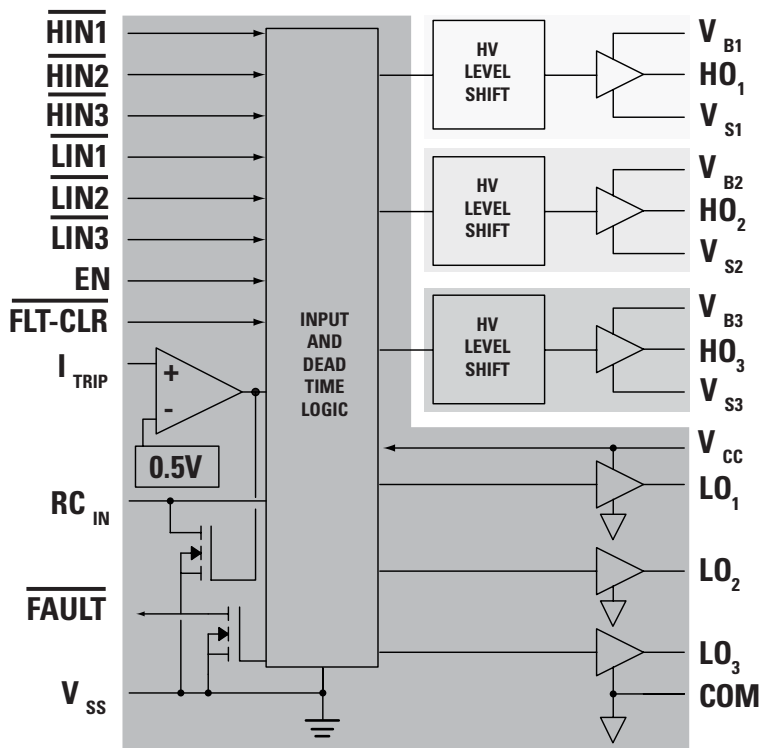
### *iMOTION*<sup>™</sup> Digital Control ICs

Part Number	Description
IRMC(K/F)312	Full featured Digital control IC with capability to control two motors and PFC in QFP64 package. Well suited for air conditioner application.
IRMC(K/F)341	Full featured Digital control IC for single motor drive QFP64 package.
IRMCK171	Minimum feature set Digital control IC for single motor drive in QFP48 package. Well suited for air conditioner application

### IRAM – Integrated Power Modules

Part Number	Voltage	Typical Power	$I_o @ T_c = 100^\circ\text{C}$ (ARMS)	Package
IRAMS06UP60(A/B)	600V	400W	3	SIP1
IRAMS10UP60(A/B)	600V	750W	5	SIP1
IRAM136-1061A2	600V			SIP1A
IRAMX16UP60(A/B)	600V	1500W	8	SIP2
IRAMX20UP60(A/B)	600V	2500W	10	
IRAM136-3063B	600V	3000W	15	SIP3
IRAM136-3023B	150V	750W	15	SIP3

Suffix A denotes Open Emitter configuration and B denotes integrated shunt resistor



High-Voltage Gate Drive ICs offer the simplest, smallest and lowest cost solution to drive MOSFETs or IGBTs up to 1200V. They can use low cost bootstrap rather than requiring an auxiliary supply. IR's wide product offering enables drives to be optimized for the design.

## Three-Phase Gate Driver ICs

Part Number	Description
IRS2336(D)*	600V Three-phase universal high performance gate drive IC
IRS26311D*	600V Three-phase Gate Driver with Ground Fault Protection, integrated bootstrap diodes, DC bus sensing, and over-voltage protection
IRS26302D*	600V Three-phase Gate Driver with Ground Fault Protection, integrated bootstrap diodes. Includes additional low side driver for PFC or Brake Switch.
IR2233	1200V Three-phase universal high performance gate drive IC

## Half-Bridge Gate Drive ICs

Part Number	Description
IRS2186x	600V Half-bridge gate driver with 4A output current for high power inverters.
IRS2184x	600V Half-bridge gate driver with +1.9A/-2.3A output current for high power inverters.
IRS2304	600V Half-bridge gate driver with +290mA/-600mA output current
IRS2609D*	600V Half-bridge gate driver with +200mA/-350mA output current

For a full listing of Gate Drivers See page 33-34

Automotive qualified parts available. See page 36

\* Bootstrap diode reduces part count for sinusoidal modulation



## IGBTs for Motor Drive packaged with fast recovery diodes

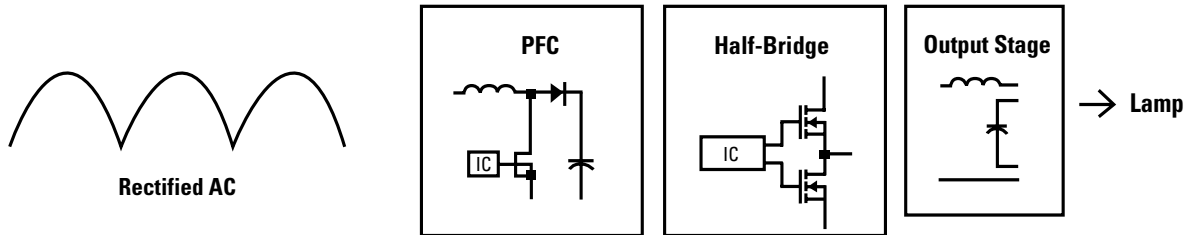
Part Number	$V_{CES}$ (V)	$I_c$ Nominal (A)	$V_{CE(ON)}$ (max) (V)	Package
IRGB4059D	600	4	2.05	TO-220AB; TO-220 FullPak
IRG(B/I)4045D		6	2	TO-220AB; TO-220 FullPak
IRG(B/I)4060D		8	1.85	TO-220AB; TO-220 FullPak
IRG(B/I)4064D		10	1.91	TO-220AB; TO-220 FullPak
IRG(S/B/I)4056D		12	1.85	D <sup>2</sup> -Pak; TO-220AB; TO-220 FullPak
IRG(B/I)4061D		18	1.95	TO-220AB; TO-220 FullPak
IRG(SL/S/B/I/P)4062D		24	1.95	TO-262; D <sup>2</sup> Pak; TO-220AB; TO-220 FullPak; TO-247AC
IRGP4069D		35	1.85	TO-247AC
IRGP4063D		48	2.14	TO-247AC
IRG4PH20KD		1200	5	4.3
IRG4PH30KD	10		4.2	TO-247AC
IRG4PH40KD	15		3.4	TO-247AC
IRG4PH50KD	24		3.5	TO-247AC
IRGP30B120KD-E	30		2.28	TO-247AD

## MOSFETs for Motor Drive

Part Number	$V_{DS}$ (V)	$R_{DS(on)}$ max. $V_{GS}=10V$ (mOhm)	$I_b$ (A)	$Q_g$ (nC)	Package
IRFS3004	40	1.75	195	160	D <sup>2</sup> Pak
IRFB3004	40	1.75	195	160	TO-220
IRFH5004	40	2.6	100	73	PQFN 5x6 mm
IRF7739L2	40	1	270	220	DirectFET®-L8
IRFS3006-7	60	2.1	240	200	D <sup>2</sup> Pak-7
IRFS3006	60	2.5	195	200	D <sup>2</sup> Pak
IRFH5006	60	4.1	100	67	PQFN 5x6 mm
IRF7749L2	60	1.3	108	220	DirectFET®-L8
IRFB3077	75	3.3	210	160	TO-220
IRFH5007	75	5.9	100	65	PQFN 5x6 mm
IRF7759L2	75	2.2	83	220	DirectFET®-L8
IRFP4468	100	2.6	195	360	TO-247
IRFH5010	100	9	100	65	PQFN 5x6 mm
IRF7769L3	100	3.5	124	200	DirectFET®-L8
IRFP4568	150	5.9	171	151	TO-247
IRFH5015	150	31	56	33	PQFN 5x6 mm
IRF7799L3	150	11	67	97	DirectFET®-L8
IRFP4668	200	9.7	130	161	TO-247
IRFH5020	200	59	41	36	PQFN 5x6 mm
IRFP4768	250	17.5	93	180	TO-247
IRFH5025	250	100	32	37	PQFN 5x6 mm
IRF779L4	250	38	35	110	DirectFET®-L8

# SOLUTIONS BY APPLICATION | LIGHTING

## FLUORESCENT BALLAST



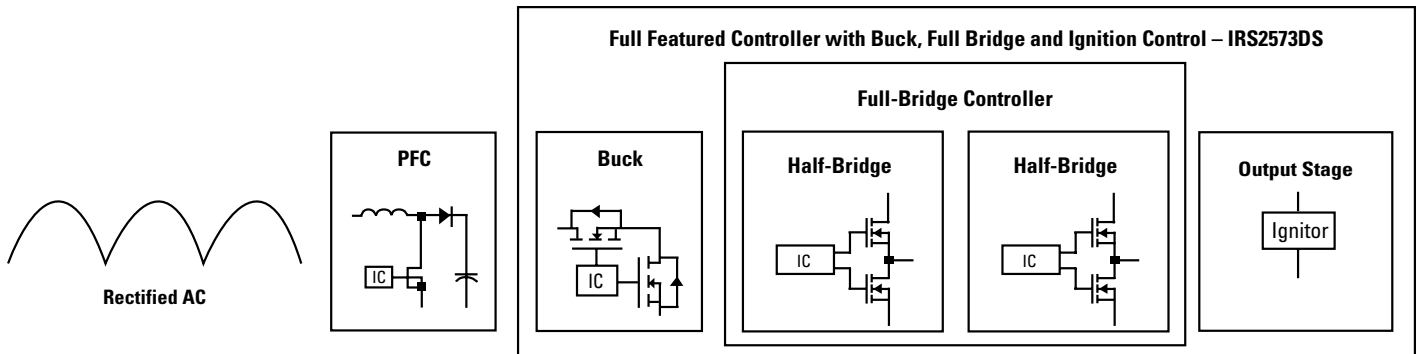
### Fixed Output Fluorescent Ballast ICs

Part Number	Description
IRS2168D	The IRS2168D is a fully integrated protected 600V ballast control IC designed to drive fluorescent lamps with PFC in 16-Pin package. Designed for universal input and/or multi-lamp ballast applications.
IRS2166D	The IRS2166D is an improved version of the IR2166; it's a fully integrated, protected 600V ballast control IC designed to drive fluorescent lamps with PFC in a 16-pin package.
IR2520D	600V Ballast Controller IC with Adaptive Zero-Voltage Switching, Internal Crest Factor Over-Current Protection and an Integrated Bootstrap Diode in a 8-Pin Dip package.
IRS21571D	Fully integrated, fully protected 600V ballast control IC designed to drive fluorescent and HID Lamps.
IR2156	High voltage half-bridge gate driver with a programmable oscillator and state diagram to form a complete ballast control IC including programmable features and built-in protection.
IRS2153D	The IRS2153D is an improved version of the popular IR2153 gate driver IC, and incorporates a internal bootstrap diode as well as a 2V under-voltage lockout hysteresis.

### Dimmable Fluorescent Ballast ICs

Part Number	Description
IRS2530D	A complete ballast IC in just 8-pin, with minimal extra components, which allows dimming down to 10%
IRS2158D	A complete 16-pin ballast IC, fully programmable. It requires minimum number of extra components, because it includes the full range of protection features like brown-out, lamp End-Of-Life and fault counter. Recommended for dimming performance below 10%.

## HID



### Full Featured Ballast ICs

Part Number	Description
IRS2573	Fully-integrated, fully-protected 600V HID control IC designed to drive all types of HID lamps. Internal circuitry provides control for ignition, warm-up, running and fault operating modes. The IRS2573D features include ignition timing control, constant lamp power control, programmable full-bridge running frequency, programmable over and under-voltage protection and programmable over-current protection.

### Full-Bridge Drivers

Part Number	Description
IRS2453D	Self-oscillating full bridge driver with 50% duty cycle, 600V - 180/260mA
IRS2101	High and low side driver, 600V - 130/270mA
IRS2308	High and low side driver, 600V - 200/350mA
IRS2104	Half-bridge driver - 600V, 130/270mA - SD
IRS2109	Half-bridge driver - 600V, 120/250mA - SD - VBS UVLO

### Buck Stage Drivers

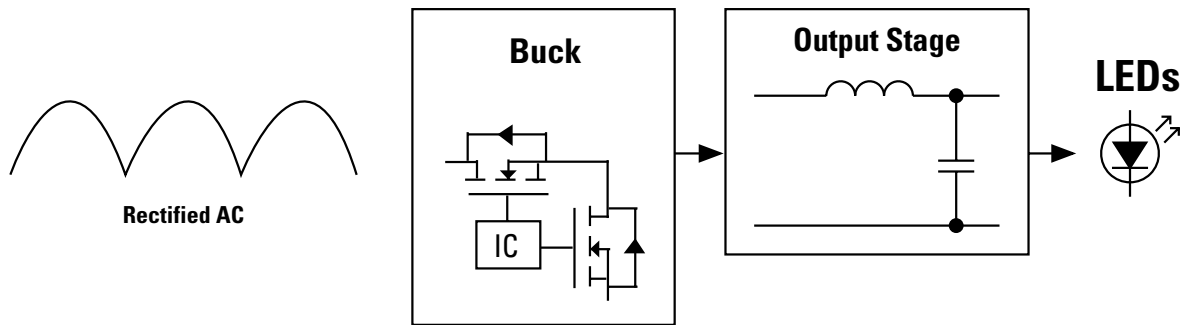
Part Number	Description
IRS2117	Single high side driver, 600V - 200/400mA
IRS21844	Half-bridge driver, 600V 1.9/2.3A

### IGBTs

Part Number	Description
IRG4RC10SD	Standard-Speed IGBT designed for applications switching below 1kHz in Dpak Package.

# SOLUTIONS BY APPLICATION | LIGHTING

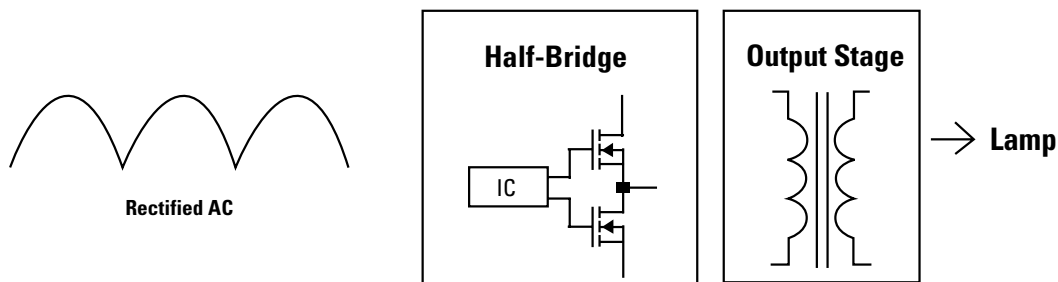
## LED CONSTANT CURRENT



### LED Constant Current ICs

Part Number	Description
IRS25401	200V High brightness LEDs (200mA and up) driver, particularly for offline non isolated applications, with long string of LEDs.
IRS25411	600V High brightness LEDs (200mA and up) driver, particularly for offline non isolated applications, with long string of LEDs.

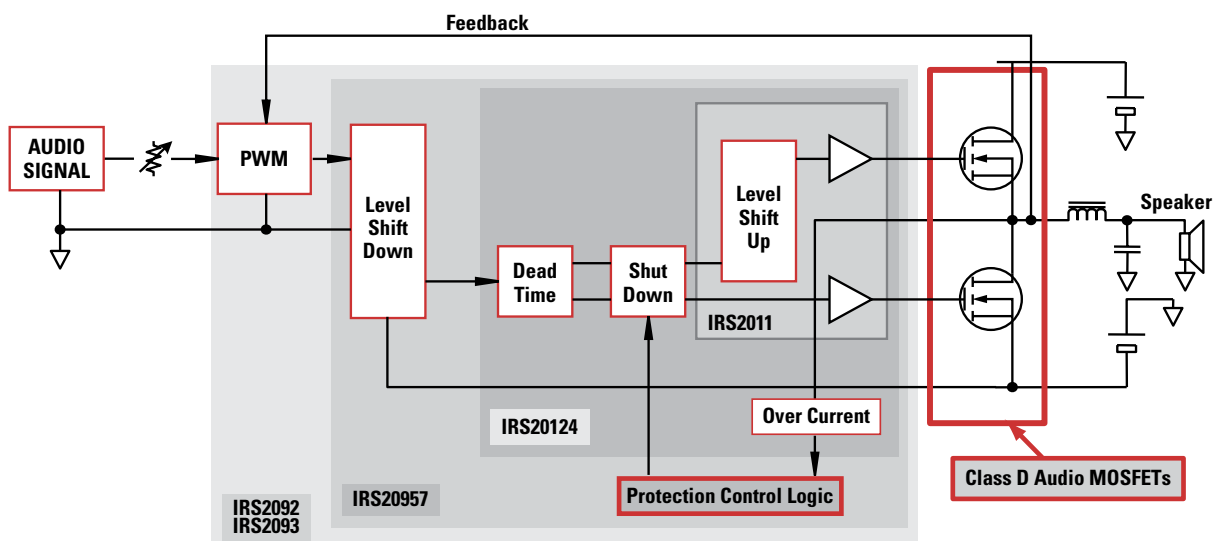
## HALOGEN BALLAST CONFIGURATION



### Halogen Converter ICs

Part Number	Description
IR2161	Halogen Converter Control IC in a 8-lead PDIP package. Features Auto Resetting Short Circuit Protection, Auto Resetting Overload Protection, Overtemperature Protection, Phase Cut Dimmable, Adaptive Deadtime, Output Voltage Shift Compensation and Softstart.
IRS2153D	The IRS2153D is an improved version of the popular IR2153 gate driver IC, and incorporates a internal bootstrap diode as well as a 2V under-voltage lockout hysteresis.

# CLASS D AUDIO | SOLUTIONS BY APPLICATION



## Audio ICs

Part Number	Description
IRS2092(S)	High Voltage, high performance two channel Class D audio amplifier driver with PWM modulator and protection.
IRS2093M	High voltage, high performance integrated four channel Class D audio amplifier driver with PWM modulators and protections.
IRS20957	High voltage, high speed MOSFET driver with a floating PWM input and integrated protection designed for Class D audio amplifier applications.
IRS20124S	A high voltage, high speed power MOSFET driver with internal dead-time, over-current protection and shutdown functions.
IRS2011(S)	A high voltage, high speed power MOSFET driver with independent high- and low-side referenced output channels.

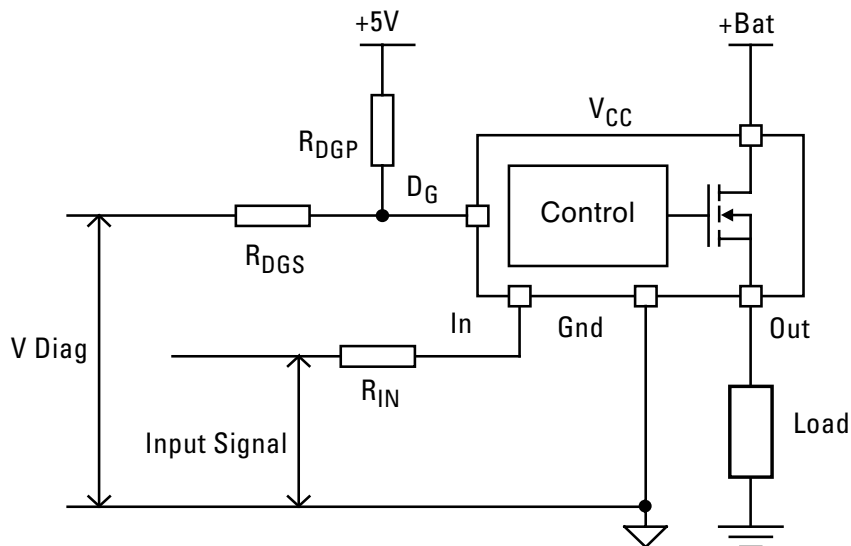
## DirectFET® MOSFETs

Clipping Power	Without Heatsink		With Heatsink	
	4 Ohm	8 Ohm	4 Ohm	8 Ohm
50W - 100W	IRF6645	IRF6665	IRF6665	IRF6665
100W - 120W	IRF6645		IRF6645	IRF6775M
120W - 200W			IRF6645	IRF6775M
200W - 250W			IRF6775M	IRF6785M

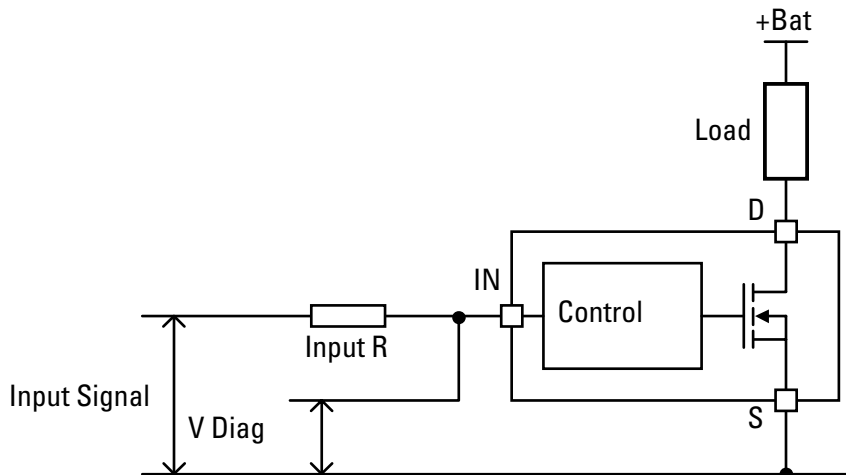
## Through -Hole Packages

Clipping Power	Package	Load	
		4 Ohm	8 Ohm
50W - 60W	TO-220 Full-Pak 5-Pin	IRFI4024H-117	IRFI4212H-117
	TO-220	—	IRFB4212
60W - 100W	TO-220 Full-Pak 5-Pin	IRFI4212H-117	IRFI4212H-117
	TO-220	IRFB4212	IRFB4212
100W - 200W	TO-220 Full-Pak 5-Pin	IRFI4212H-117	IRFI4019H-117
	TO-220	IRFB4212	IRFB4019
200W - 300W	TO-220 Full-Pak 5-Pin	IRFI4019H-117	IRFI4020H-117
	TO-220	IRFB4019	IRFB4020
300W - 500W	TO-220 Full-Pak 5-Pin	—	—
	TO-220	IRFB4227	IRFB4229

## HIGH-SIDE



## LOW-SIDE



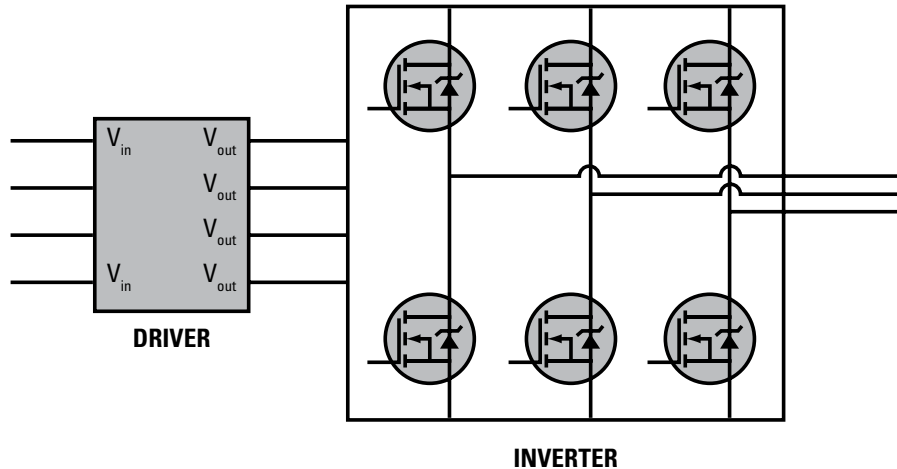
IR's Intelligent Power Switches integrate a low  $R_{DS(on)}$  output HEXFET® power MOSFET into a single package with protection and control circuits, making them the most rugged, efficient and compact devices available for automotive loads in harsh environments. All devices are qualified to AEC-Q100 Qualification

### APPLICATIONS

- Transmission Controls
- Junction Boxes
- Electronic Stability Controls
- Anti-lock Brakes, Traction Control
- Diesel and Gas Direct Injection
- Pump Motors, Radiator Fans
- Head Diesel Glow Plugs
- Lamps

See *Product Catalog* page 35 for full product listing

## ELECTRONIC POWER STEERING



### N Channel MOSFETs

$V_{(BR)DSS}$ (V)	$R_{DS(on)}$ max @ 10V <sub>GS</sub> mOhm	ID max @ TC = 25°C (A)	$Q_g$ typ @ 10V <sub>GS</sub> (nC)	D <sup>2</sup> Pak	D <sup>2</sup> Pak-7	TO-220	TO-262
40	1.25	400	160		AUIRFS3004-7P		
40	1.60	320	170		AUIRF2804S-7P		
40	1.75	340	160	AUIRFS3004		AUIRFB3004	
40	2.00	270	160	AUIRF2804S		AUIRF2804	AUIRF2804L
60	2.10	293	200		AUIRFS3006-7P		
60	2.50	270	200	AUIRFS3006		AUIRFB3006	
75	2.60	260	160		AUIRFS3107-7P		
75	3.00	230	160	AUIRFS3107			

### DirectFET<sup>®2</sup> MOSFETs

$V_{(BR)DSS}$ (V)	$R_{DS(on)}$ max @ 10V <sub>GS</sub> mOhm	ID max @ TC = 25°C (A)	$Q_g$ typ @ 10V <sub>GS</sub> (nC)	Pad Outline	Optimized Feature	Medium Can	Large Can
40	1.0	270	220	L8	Low $R_{DS(on)}$		AUIRF7739L2
40	1.6	210	147	L6	Low $R_{DS(on)}$		AUIRF7738L2
40	1.9	156	89	L6	Low $R_{DS(on)}$		AUIRF7737L2
40	3.0	108	72	M4	Low $R_{DS(on)}$	AUIRF7736M2	

Automotive Q100 and Q101 qualified devices for efficient inveterized motor drive systems. DirectFET<sup>®2</sup> Package enables higher power density using dual-sided cooling. DirectFET<sup>®2</sup> also improved EMI performance by reducing parasitic inductance.

### Driver ICs

Part Number	Description	Packages	Output Current	Offset Voltage	VCC UVLO
AUIRS21814S	2ch High and Low –Side	SOIC14	+1.9 / -2.3A	600V	8.2V
AUIRS2110S	2ch High and Low –Side	SOIC16W	+2.0 / -2.0A	500V	8.2V
AUIRS2336S	3 Phase Inverter Driver	SOIC28W	+200 / -350mA	600V	8.2V
AUIRS2184S	Half Bridge	SOIC8	+1.4 / -1.8A	600V	8.2V





# PRODUCT CATALOG





DirectFET®					
Part Number	Voltage	$I_D$ @ $T_c = 25^\circ\text{C}$	$R_{DS(on)}$ max @ 10V	$Q_g$ typ @ 10V	Can Size
IRF6709S2	25V	39A	7.8 mOhm	8.1 nC	Small Can
IRF6710S2	25V	37A	5.9 mOhm	8.8 nC	Small Can
IRF6712S	25V	68A	4.9 mOhm	13 nC	Small Can
IRF6713S	25V	95A	3.0 mOhm	21 nC	Small Can
IRF6714M	25V	166A	2.1 mOhm	29 nC	Medium Can
IRF6715M	25V	180A	1.6 mOhm	40 nC	Medium Can
IRF6716M	25V	180A	1.6 mOhm	39 nC	Medium Can
IRF6717M	25V	220A	1.25 mOhm	46 nC	Medium Can
IRF6795M	25V	160A	1.8 mOhm	35 nC	Medium Can
IRF6797M	25V	210A	1.4 mOhm	45 nC	Medium Can
IRF6718L2	25V	270A	0.7 mOhm	64 nC	Large Can
IRF6720S2	30V	35A	8.0 mOhm	7.9 nC	Small Can
IRF6722M	30V	56A	7.7 mOhm	11 nC	Medium Can
IRF6722S	30V	58A	7.3 mOhm	11 nC	Small Can
IRF6721S	30V	60A	7.3 mOhm	11.7 nC	Small Can
IRF6724M	30V	150A	2.5 mOhm	33 nC	Medium Can
IRF6725M	30V	170A	2.2 mOhm	36 nC	Medium Can
IRF6726M	30V	180A	1.7 mOhm	51 nC	Medium Can
IRF6727M	30V	180A	1.7 mOhm	49 nC	Medium Can
IRF6614	40V	55A	8.3 mOhm	19 nC	Small Can
IRF6616	40V	106A	5.0 mOhm	29 nC	Medium Can
IRF6613	40V	150A	3.4 mOhm	42 nC	Medium Can
IRF7739L2	40V	270A	1.0 mOhm	220 nC	Large Can
IRF6674	60V	67A	11.2 mOhm	25 nC	Medium Can
IRF6648	60V	86A	7.0 mOhm	36 nC	Medium Can
IRF7749L2	60V	108A	1.3mohms	220nC	Large Can
IRF7759L2	75V	83.8	2.2 mohms	220nC	Large Can
IRF6668	80V	55A	15 mOhm	22 nC	Medium Can
IRF6646	80V	68A	9.5 mOhm	36 nC	Medium Can
IRF6665	100V	19A	62 mOhm	8.7 nC	Small Can
IRF7665S2	100V	14.7A	60 mOhm	8.3 nC	Small Can
IRF6645	100V	25A	35 mOhm	14 nC	Small Can
IRF6662	100V	47A	22 mOhm	22 nC	Medium Can
IRF6644	100V	60A	13 mOhm	35 nC	Medium Can
IRF7769L2	100V	124A	3.5 mOhm	200 nC	Large Can
IRF6775M	150V	28A	47 mOhm	25 nC	Medium Can
IRF6643	150V	35A	35 mOhm	39 nC	Medium Can
IRF7779L2	150V	67A	11 mOhm	97 nC	Large Can
IRF6785M	200V	15A	100 mOhm	26 nC	Medium Can
IRF6641	200V	26A	60 mOhm	34 nC	Medium Can
IRF7799L2	250V	35A	38 mOhm	110 nC	Large Can

# PRODUCT CATALOG | MOSFETs

## SURFACE MOUNT PACKAGES 20 - 30V

Part Number	Voltage	$I_D @ T_C = 25^\circ\text{C}$	$R_{DS(on)} \text{ max @ 10V}$	$Q_g \text{ typ @ 10V}$	Package
IRF3717	20V	20A*	4.4 m0hm	22 nC	SO-8
IRLR3714Z	20V	37A	15 m0hm	4.7 nC	D-Pak
IRLR3715Z	20V	49A	11 m0hm	7.2 nC	D-Pak
IRFR3704Z	20V	60A	8.4 m0hm	9.3 nC	D-Pak
IRFR3711Z	20V	93A	5.7 m0hm	18 nC	D-Pak
IRLR3717	20V	120A	4.2 m0hm	21 nC	D-Pak
IRL3714ZS	20V	36A	16 m0hm	4.8 nC	D <sup>2</sup> Pak
IRL3715ZS	20V	50A	11 m0hm	7 nC	D <sup>2</sup> Pak
IRF3704ZS	20V	67A	7.9 m0hm	8.7 nC	D <sup>2</sup> Pak
IRF3711ZS	20V	92A	6 m0hm	16 nC	D <sup>2</sup> Pak
IRF1324S	24V	340A	1.65 m0hm	160 nC	D <sup>2</sup> Pak
IRF1324S	24V	340A	1.65 m0hm	160 nC	D <sup>2</sup> Pak
IRF1324S-7P	24V	429A	1 m0hm	180 nC	D <sup>2</sup> Pak-7P
IRF8252	25V	25A*	2.7 m0hm	35 nC	SO-8
IRFH5250	25V	100A	1.15 m0hm	52 nC	PQFN 5x6mm
IRLR8256	25V	81A	5.7 m0hm	10 nC	D-Pak
IRLR8259	25V	57A	8.7 m0hm	6.8 nC	D-Pak
IRLML2030	30V	2.7A*	100 m0hm	1.0 nC	SOT-23
IRLML0030	30V	5.2A*	27 m0hm	3.6 nC	SOT-23
IRFH3702	30V	16A	7.1 m0hm	9.6 nC	PQFN 3x3mm
IRFH3707	30V	12A	12.4 m0hm	5.4 nC	PQFN 3x3mm
IRFHM831	30V	24A	7.8 m0hm	7.3 nC	PQFN 3x3mm
IRFHM830	30V	40A	3.8 m0hm	15 nC	PQFN 3x3mm
IRF8707	30V	11A*	11.9 m0hm	6.2 nC	SO-8
IRF8714	30V	14A*	8.7 m0hm	8.1 nC	SO-8
IRF8721	30V	14A*	8.5 m0hm	8.3 nC	SO-8
IRF8736	30V	18A*	4.8 m0hm	17 nC	SO-8
IRF8734	30V	21A*	3.5 m0hm	20 nC	SO-8
IRF7862	30V	21A*	3.3 m0hm	30 nC	SO-8
IRF8788	30V	24A*	2.8 m0hm	44 nC	SO-8
IRFH7914	30V	14A	8.7 m0hm	8.1 nC	PQFN 5x6mm
IRFH7921	30V	15A	8.5 m0hm	9.3 nC	PQFN 5x6mm
IRFH5306	30V	44A	8.1 m0hm	7.8 nC	PQFN 5x6mm
IRFH7936	30V	18A	4.8 m0hm	17 nC	PQFN 5x6mm
IRFH5304	30V	79A	4.5 m0hm	16 nC	PQFN 5x6mm
IRFH7934	30V	24A	3.5 m0hm	20 nC	PQFN 5x6mm
IRFH7932	30V	25A	3.3 m0hm	34 nC	PQFN 5x6mm
IRFH5302	30V	100A	2.1 m0hm	29 nC	PQFN 5x6mm
IRFH5301	30V	100A	1.85 m0hm	37 nC	PQFN 5x6mm
IRFH5300	30V	100A	1.4 m0hm	50 nC	PQFN 5x6mm
IRLR7807Z	30V	43A	13.8 m0hm	7 nC	D-Pak
IRLR8729	30V	71A	8.6 m0hm	10 nC	D-Pak
IRLR8721	30V	65A	8.4 m0hm	8.5 nC	D-Pak
IRLR8726	30V	85A	6.0 m0hm	18 nC	D-Pak

\*  $I_D @ T_A = 25^\circ\text{C}$

## SURFACE MOUNT PACKAGES 20 - 30V

Part Number	Voltage	$I_D @ T_c = 25^\circ\text{C}$	$R_{DS(on)} \text{ max @ 10V}$	$Q_g \text{ typ @ 10V}$	Package
IRLR8113	30V	94A	6 mOhm	22 nC	D-Pak
IRLR8743	30V	160A	3.1 mOhm	39 nC	D-Pak
IRF3707ZS	30V	59A	9.5 mOhm	9.7 nC	D <sup>2</sup> Pak
IRF3709ZS	30V	87A	6.3 mOhm	17 nC	D <sup>2</sup> Pak
IRL8113S	30V	105A	6 mOhm	23 nC	D <sup>2</sup> Pak
IRL7833S	30V	150A	3.8 mOhm	32 nC	D <sup>2</sup> Pak
IRF2903ZS	30V	260A	2.4 mOhm	160 nC	D <sup>2</sup> Pak

## SURFACE MOUNT PACKAGES 40 - 250V

Part Number	Voltage	$I_D @ T_c = 25^\circ\text{C}$	$R_{DS(on)} \text{ max @ 10V}$	$Q_g \text{ typ @ 10V}$	Package
IRLML0040	40V	3.6A*	56 mOhm	2.6 nC	SOT-23
IRF7842	40V	18A*	5 mOhm	33 nC	SO-8
IRFH5204	40V	100A	4.3 mOhm	42 nC	PQFN 5x6mm
IRFH5104	40V	100A	3.5 mOhm	53 nC	PQFN 5x6mm
IRFH5004	40V	100A	2.6 mOhm	73 nC	PQFN 5x6mm
IRFR3504Z	40V	77A	9 mOhm	30 nC	D-Pak
IRFR4104	40V	119A	5.5 mOhm	59 nC	D-Pak
IRF4104S	40V	120A	5.5 mOhm	68 nC	D <sup>2</sup> Pak
IRF1404ZS	40V	190A	3.7 mOhm	100 nC	D <sup>2</sup> Pak
IRF2804S	40V	270A	2.0 mOhm	160 nC	D <sup>2</sup> Pak
IRFS3004	40V	340A	1.75 mOhm	160 nC	D <sup>2</sup> Pak
IRF2804S-7P	40V	320A	1.6 mOhm	170 nC	D <sup>2</sup> Pak-7P
IRFS3004-7P	40V	400A	1.25 mOhm	160 nC	D <sup>2</sup> Pak-7P
IRFR4105Z	55V	30A	24.5 mOhm	18 nC	D-Pak
IRFR48Z	55V	62A	11 mOhm	40 nC	D-Pak
IRFZ44ZS	55V	51A	13.9 mOhm	29 nC	D <sup>2</sup> Pak
IRF3205ZS	55V	110A	6.5 mOhm	76 nC	D <sup>2</sup> Pak
IRLML2060	60V	1.2A*	460 mOhm	0.4 nC	SOT-23
IRLML0060	60V	2.7A*	92 mOhm	2.5 nC	SOT-23
IRF7855	60V	12A*	9.4 mOhm	26 nC	SO-8
IRFH5406	60V	40A	14.4 mOhm	23 nC	PQFN 5x6mm
IRFH5206	60V	89A	6.7 mOhm	40 nC	PQFN 5x6mm
IRFH5106	60V	100A	5.6 mOhm	50 nC	PQFN 5x6mm
IRFH5006	60V	100A	4.1 mOhm	67 nC	PQFN 5x6mm
IRFR3806	60V	42A	15.8 mOhm	22 nC	D-Pak
IRFR1018E	60V	77A	8.4 mOhm	46 nC	D-Pak
IRFS3806	60V	42A	15.8 mOhm	22 nC	D <sup>2</sup> Pak
IRF1018ES	60V	77A	8.4 mOhm	51 nC	D <sup>2</sup> Pak
IRFS3306	60V	160A	4.2 mOhm	85 nC	D <sup>2</sup> Pak
IRFS3206	60V	210A	3 mOhm	120 nC	D <sup>2</sup> Pak
IRFS3006	60V	270A	2.5 mOhm	200 nC	D <sup>2</sup> Pak
IRFS3006-7P	60V	293A	2.1 mOhm	200 nC	D <sup>2</sup> Pak-7P
IRFH5207	75V	71A	9.6 mOhm	39 nC	PQFN 5x6mm
IRFH5007	75V	100A	5.9 mOhm	65 nC	PQFN 5x6mm

\*  $I_D @ T_A = 25^\circ\text{C}$

# PRODUCT CATALOG | MOSFETs

## SURFACE MOUNT PACKAGES 40 - 250V

Part Number	Voltage	$I_D @ T_C = 25^\circ\text{C}$	$R_{DS(on)} \text{ max @ } 10\text{V}$	$Q_g \text{ typ @ } 10\text{V}$	Package
IRFR2607Z	75V	45A	22 mOhm	34 nC	D-Pak
IRFR2307Z	75V	53A	16 mOhm	50 nC	D-Pak
IRFR3607	75V	80A	9.0 mOhm	51 nC	D-Pak
IRFS3607	75V	80A	9.0 mOhm	51 nC	D <sup>2</sup> Pak
IRFS3307Z	75V	120A	5.8 mOhm	79 nC	D <sup>2</sup> Pak
IRFS3207Z	75V	170A	4.1 mOhm	120 nC	D <sup>2</sup> Pak
IRFS3107	75V	230A	3.0 mOhm	160 nC	D <sup>2</sup> Pak
IRFS3107-7P	75V	260A	2.6 mOhm	160 nC	D <sup>2</sup> Pak-7P
IRF7493	80V	9.2A*	15 mOhm	31 nC	SO-8
IRF7854	80V	10A*	13.4 mOhm	27 nC	SO-8
IRLML0100	100V	1.6A*	220 mOhm	2.5 nC	SOT-23
IRF7495	100V	7.3A*	22 mOhm	34 nC	SO-8
IRF7853	100V	8.3A*	18 mOhm	28 nC	SO-8
IRFH5210	100V	55A	14.9 mOhm	39 nC	PQFN 5x6mm
IRFH5110	100V	63A	12.4 mOhm	48 nC	PQFN 5x6mm
IRFH5010	100V	100A	9.0 mOhm	65 nC	PQFN 5x6mm
IRFR120Z	100V	8.7A	190 mOhm	6.9 nC	D-Pak
IRFR540Z	100V	35A	28.5 mOhm	39 nC	D-Pak
IRFR3710Z	100V	56A	18 mOhm	69 nC	D-Pak
IRF540ZS	100V	36A	26.5 mOhm	42 nC	D <sup>2</sup> Pak
IRF3710ZS	100V	59A	18 mOhm	82 nC	D <sup>2</sup> Pak
IRFS4610	100V	73A	14 mOhm	90 nC	D <sup>2</sup> Pak
IRFS4410Z	100V	97A	9 mOhm	83 nC	D <sup>2</sup> Pak
IRFS4310Z	100V	127A	6 mOhm	120 nC	D <sup>2</sup> Pak
IRFS4010	100V	180A	4.7 mOhm	143 nC	D <sup>2</sup> Pak
IRFS4010-7P	100V	190A	4.0 mOhm	150 nC	D <sup>2</sup> Pak-7P
IRF7494	150V	5.2A*	44 mOhm	36 nC	SO-8
IRF7815	150V	5.1A*	43 mOhm	25 nC	SO-8
IRFH5015	150V	56A	31 mOhm	33 nC	PQFN 5x6mm
IRFR4615	150V	33A	42 mOhm	26 nC	D-Pak
IRFS4615	150V	33A	42 mOhm	26 nC	D <sup>2</sup> Pak
IRFS4321	150V	83A	15 mOhm	71 nC	D <sup>2</sup> Pak
IRFS4115	150V	99A	12.1 mOhm	77 nC	D <sup>2</sup> Pak
IRFS4115-7P	150V	105A	11.8 mOhm	78 nC	D <sup>2</sup> Pak-7P
IRF7492	200V	3.7A*	79 mOhm	39 nC	SO-8
IRFH5020	200V	41A	59 mOhm	36 nC	PQFN 5x6mm
IRFR4620	200V	24A	78 mOhm	25 nC	D-Pak
IRFS4020	200V	18A	100 mOhm	18 nC	D <sup>2</sup> Pak
IRFS4620	200V	24A	77.5 mOhm	25 nC	D <sup>2</sup> Pak
IRFS4227	200V	62A	26 mOhm	70 nC	D <sup>2</sup> Pak
IRFS4127	200V	76A	21 mOhm	110 nC	D <sup>2</sup> Pak
IRFH5025	250V	31A	104 mOhm	36 nC	PQFN 5x6mm
IRFS4229	250V	45A	48 mOhm	72 nC	D <sup>2</sup> Pak

\*  $I_D @ T_A = 25^\circ\text{C}$

## Through-Hole Packages 20 - 30V

Part Number	Voltage	$I_D @ T_c = 25^\circ\text{C}$	$R_{DS(on)} \text{ max @ 10V}$	$Q_g \text{ typ @ 10V}$	Package
IRLU3714Z	20V	37A	15 mOhm	4.7 nC	I-Pak
IRLU3715Z	20V	49A	11 mOhm	7.2 nC	I-Pak
IRFU3704Z	20V	60A	8.4 mOhm	9.3 nC	I-Pak
IRFU3711Z	20V	93A	5.7 mOhm	18 nC	I-Pak
IRLU3717	20V	120A	4.2 mOhm	21 nC	I-Pak
IRL3714Z	20V	36A	16 mOhm	4.8 nC	TO-220AB
IRL3715Z	20V	50A	11 mOhm	7 nC	TO-220AB
IRF3704Z	20V	67A	7.9 mOhm	8.7 nC	TO-220AB
IRF3711Z	20V	92A	6 mOhm	16 nC	TO-220AB
IRF1324	24V	353A	1.5 mOhm	160 nC	TO-220AB
IRLU8256	25V	81A	5.7 mOhm	10 nC	I-Pak
IRLU8259	25V	57A	8.7 mOhm	6.8 nC	I-Pak
IRLU7807Z	30V	43A	13.8 mOhm	7 nC	I-Pak
IRLU8729	30V	71A	8.6 mOhm	10 nC	I-Pak
IRLU8721	30V	65A	8.4 mOhm	8.5 nC	I-Pak
IRLU8726	30V	85A	6.0 mOhm	18 nC	I-Pak
IRLU8113	30V	94A	6 mOhm	22 nC	I-Pak
IRLU8743	30V	160A	3.1 mOhm	39 nC	I-Pak
IRLB3813	30V	260A	1.95 mOhm	57 nC	TO-220AB
IRLB8721	30V	50A	9 mOhm	8 nC	TO-220AB
IRF3709Z	30V	87A	6.3 mOhm	17 nC	TO-220AB
IRL8113	30V	105A	6 mOhm	23 nC	TO-220AB
IRLB8748	30V	78A	4.8 mOhm	15 nC	TO-220AB
IRLB8743	30V	150A	3.2 mOhm	36 nC	TO-220AB
IRF2903Z	30V	260A	2.4 mOhm	160 nC	TO-220AB

## Through-Hole Packages 40 - 75V

Part Number	Voltage	$I_D @ T_c = 25^\circ\text{C}$	$R_{DS(on)} \text{ max @ 10V}$	$Q_g \text{ typ @ 10V}$	Package
IRFU3504Z	40V	77A	9 mOhm	30 nC	I-Pak
IRFU4104	40V	119A	5.5 mOhm	59 nC	I-Pak
IRF2804	40V	270A	2.3 mOhm	160 nC	TO-220AB
IRFB3004	40V	340A	1.75 mOhm	160 nC	TO-220AB
IRF4104	40V	120A	5.5 mOhm	68 nC	TO-220AB
IRF1404Z	40V	190A	3.7 mOhm	100 nC	TO-220AB
IRFP4004	40V	350A	1.7 mOhm	220 nC	TO-247AC
IRFU4105Z	55V	30A	24.5 mOhm	18 nC	I-Pak
IRFU48Z	55V	62A	11 mOhm	40 nC	I-Pak
IRF3205Z	55V	110A	6.5 mOhm	76 nC	TO-220AB
IRFZ44Z	55V	51A	13.9 mOhm	29 nC	TO-220AB
IRFZ48Z	55V	61A	11 mOhm	43 nC	TO-220AB
IRFU3806	60V	42A	15.8 mOhm	22 nC	I-Pak
IRFU1018E	60V	77A	8.4 mOhm	51 nC	I-Pak
IRFB3306	60V	160A	4.2 mOhm	85 nC	TO-220AB
IRFB3206	60V	210A	3 mOhm	120 nC	TO-220AB

# PRODUCT CATALOG | MOSFETs

## Through-Hole Packages 40 - 75V

Part Number	Voltage	$I_D @ T_c = 25^\circ\text{C}$	$R_{DS(on)} \text{ max @ } 10\text{V}$	$Q_g \text{ typ @ } 10\text{V}$	Package
IRFB3006	60V	270A	2.5 mOhm	200 nC	TO-220AB
IRFB3806	60V	43A	15.8 mOhm	22 nC	TO-220AB
IRF1018E	60V	79A	8.4 mOhm	46 nC	TO-220AB
IRFP3306	60V	160A	4.2 mOhm	85 nC	TO-247AC
IRFP3206	60V	210A	3 mOhm	120 nC	TO-247AC
IRFU2607Z	75V	45A	22 mOhm	34 nC	I-Pak
IRFU2307Z	75V	53A	16 mOhm	50 nC	I-Pak
IRFU3607	75V	80A	9.0 mOhm	51 nC	I-Pak
IRFB3077	75V	210A	3.3 mOhm	160 nC	TO-220AB
IRFB3607	75V	80A	9.0 mOhm	56 nC	TO-220AB
IRFB3307Z	75V	120A	5.8 mOhm	79 nC	TO-220AB
IRFB207Z	75V	170A	4.1 mOhm	120 nC	TO-220AB
IRFP2907Z	75V	170A	4.5 mOhm	180 nC	TO-247AC
IRFP3077	75V	210A	3.3 mOhm	160 nC	TO-247AC
IRFP4368	75V	350A	1.85 mOhm	380 nC	TO-247AC

## Through-Hole Packages 100 - 250V

Part Number	Voltage	$I_D @ T_c = 25^\circ\text{C}$	$R_{DS(on)} \text{ max @ } 10\text{V}$	$Q_g \text{ typ @ } 10\text{V}$	Package
IRFU120Z	100V	8.7A	190 mOhm	6.9 nC	I-Pak
IRFU3710Z	100V	56A	18 mOhm	69 nC	I-Pak
IRF3710Z	100V	59A	18 mOhm	82 nC	TO-220AB
IRFB4610	100V	73A	14 mOhm	90 nC	TO-220AB
IRFB4410Z	100V	97A	9 mOhm	83 nC	TO-220AB
IRFB4310Z	100V	127A	6 mOhm	120 nC	TO-220AB
IRFB4110	100V	180A	4.5 mOhm	150 nC	TO-220AB
IRFB4212	100V	18A	72.5 mOhm	15 nC	TO-220AB
IRF540Z	100V	36A	26.5 mOhm	42 nC	TO-220AB
IRFP4110	100V	168A	4.6 mOhm	152 nC	TO-247AC
IRFP4468	100V	290A	2.6 mOhm	360 nC	TO-247AC
IRFP4410Z	100V	97A	9 mOhm	83 nC	TO-247AC
IRFP4310Z	100V	127A	6 mOhm	120 nC	TO-247AC
IRFU4615	150V	33A	42 mOhm	26 nC	I-Pak
IRFB4615	150V	35A	39 mOhm	26 nC	TO-220AB
IRFB4321	150V	83A	15 mOhm	71 nC	TO-220AB
IRFB4115	150V	104A	11 mOhm	77 nC	TO-220AB
IRFB4019	150V	17A	95 mOhm	13 nC	TO-220AB
IRFP4568	150V	171A	5.9 mOhm	151 nC	TO-247AC
IRFP4321	150V	78A	15.5 mOhm	71 nC	TO-247AC
IRFU4620	200V	24A	78 mOhm	25 nC	I-Pak
IRFB4620	200V	25A	72.5 mOhm	25 nC	TO-220AB
IRFB4227	200V	65A	24 mOhm	70 nC	TO-220AB
IRFB4127	200V	76A	20 mOhm	100 nC	TO-220AB
IRFB4020	200V	18A	100 mOhm	18 nC	TO-220AB
IRFP4668	200V	130A	9.7 mOhm	161 nC	TO-247AC
IRFP4227	200V	65A	25 mOhm	70 nC	TO-247AC



## Through-Hole Packages 100 - 250V

Part Number	Voltage	$I_D @ T_c = 25^\circ\text{C}$	$R_{DS(on)} \text{ max @ 10V}$	$Q_g \text{ typ @ 10V}$	Package
IRFB4229	250V	46A	46 mOhm	72 nC	TO-220AB
IRFB4332	250V	60A	33 mOhm	99 nC	TO-220AB
IRFP4768	250V	93A	17.5 mOhm	180 nC	TO-247AC
IRFP4229	250V	44A	46 mOhm	72 nC	TO-247AC
IRFP4332	250V	57A	33 mOhm	99 nC	TO-247AC

## 4.5V Drive Capable Logic Level MOSFETs

Part Number	Voltage	$I_D @ T_c = 25^\circ\text{C}$	$R_{DS(on)} \text{ max @ 10V}$	$Q_g \text{ typ @ 10V}$	Package
IRLH5034	40V	100A	2.4 mOhm	43 nC	PQFN 5x6mm
IRL1404ZS	40V	200A	3.1 mOhm	75 nC	D <sup>2</sup> Pak
IRLS3034	40V	291A	1.62 mOhm	130 nC	D <sup>2</sup> Pak
IRLS3034-7P	40V	347A	1.24 mOhm	130 nC	D <sup>2</sup> Pak-7P
IRLR3114Z	40V	130A	4.9 mOhm	40 nC	D-Pak
IRL1404Z	40V	200A	3.1 mOhm	75 nC	TO-220AB
IRLB3034	40V	343A	1.7 mOhm	108 nC	TO-220AB
IRLP3034	40V	327A	1.7 mOhm	108 nC	TO-247AC
IRL1104S	40V	104A	8 mOhm	45.3 nC	D <sup>2</sup> Pak
IRL1104	40V	104A	8 mOhm	45.3 nC	TO-220AB
IRLR2905Z	55V	60A	13.5 mOhm	23 nC	D-Pak
IRLR3705Z	55V	89A	8 mOhm	44 nC	D-Pak
IRLR024Z	55V	16A	58 mOhm	6.6 nC	D-Pak
IRLZ44ZS	55V	51A	13.5 mOhm	24 nC	D <sup>2</sup> Pak
IRL3705ZS	55V	86A	8 mOhm	40 nC	D <sup>2</sup> Pak
IRLZ24NS	55V	18A	60 mOhm	10 nC	D <sup>2</sup> Pak
IRLZ44Z	55V	51A	13.5 mOhm	24 nC	TO-220AB
IRL3705Z	55V	86A	8 mOhm	40 nC	TO-220AB
IRLZ24N	55V	18A	60 mOhm	10 nC	TO-220AB
IRLH5036	60V	100A	4.4 mOhm	44 nC	PQFN 5x6mm
IRLR3636	60V	99A	6.8 mOhm	33 nC	D-Pak
IRLS3036-7P	60V	300A	1.9 mOhm	110 nC	D <sup>2</sup> Pak-6
IRLS3036	60V	270A	2.4 mOhm	91 nC	D <sup>2</sup> Pak
IRLB3036	60V	370A	2.4 mOhm	91 nC	TO-220AB
IRLH5030	100V	100A	9.0 mOhm	44 nC	PQFN 5x6mm
IRLR3410	100V	15A	105 mOhm	22.7 nC	D-Pak
IRLR3110Z	100V	63A	14 mOhm	34 nC	D-Pak
IRL2910S	100V	55A	26 mOhm	93.3 nC	D <sup>2</sup> Pak
IRLS4030	100V	180A	4.3 mOhm	87 nC	D <sup>2</sup> Pak
IRLS4030-7P	100V	190A	3.9 mOhm	93 nC	D <sup>2</sup> Pak-6
IRLR120N	100V	11A	185 mOhm	13.3 nC	D-Pak
IRL530NS	100V	17A	100 mOhm	22.7 nC	D <sup>2</sup> Pak
IRL540NS	100V	36A	44 mOhm	49.3 nC	D <sup>2</sup> Pak
IRL2910	100V	48A	260 mOhm	93.3 nC	TO-220AB
IRLB4030	100V	180A	4.3 mOhm	87 nC	TO-220AB
IRL520NS	100V	10A	180 mOhm	13.3 nC	D <sup>2</sup> Pak
IRL530N	100V	17A	100 mOhm	22.7 nC	TO-220AB

# PRODUCT CATALOG | MOSFETs

## 4.5V Drive Capable Logic Level MOSFETs

Part Number	Voltage	$I_D @ T_C = 25^\circ\text{C}$	$R_{DS(on)} \text{ max @ } 10\text{V}$	$Q_g \text{ typ @ } 10\text{V}$	Package
IRL540N	100V	36A	44 mOhm	49.3 nC	TO-220AB
IRL520N	100V	10A	180 mOhm	13.3 nC	TO-220AB

## P-Channel MOSFETs

Part Number	$I_D @ T_C = 25^\circ\text{C}$	$R_{DS(on)} \text{ max @ } -10\text{V}$	$Q_g \text{ typ @ } -10\text{V}$	Package
IRLML9303	-30V	1A*	150 mOhm	SOT-23
IRLML9301	-30V	3.6A*	64 mOhm	SOT-23
IRF9328	-30V	10A*	12 mOhm	SO-8
IRF9321	-30V	15A*	7.2 mOhm	SO-8
IRF9317	-30V	16A*	6.6 mOhm	SO-8
IRF9310	-30V	21A*	4.6 mOhm	SO-8
IRF9333	-30V	7.5A*	19 mOhm	SO-8
IRF9335	-30V	5.4A*	59 mOhm	SO-8
IRFHM9331	-30V	10A	15 mOhm	PQFN 3x3mm
IRFH9305	-30V	27A	3 mOhm	PQFN 5x6mm
IRFH9310	-30V	23A	4.6 mOhm	PQFN 5x6mm

## 2.5V Drive Capable Logic Level MOSFETs

Part Number	Voltage	$I_D @ T_C = 25^\circ\text{C}$	$R_{DS(on)} \text{ max @ } 4.5\text{V}$	$Q_g \text{ typ @ } 4.5\text{V}$	Package
IRLML6246	20V	4A*	43 mOhm	3 nC	SOT-23
IRLML6244	20V	6.4A*	21 mOhm	8 nC	SOT-23
IRF6201	20V	27A*	2.45 mOhm	130 nC	SO-8
IRFH6200	20V	100A	1.2 mOhm	155 nC	PQFN 5x6mm
IRLR6225	20V	124A	4.0 mOhm	54 nC	D-Pak
IRLML6346	30V	3.3A*	77 mOhm	3 nC	SOT-23
IRLML6344	30V	6.3A*	34 mOhm	7.5 nC	SOT-23

## FETKY Devices with Integrated Schottky Diode

Part Number	Voltage	$I_D @ T_C = 25^\circ\text{C}$	$R_{DS(on)} \text{ max @ } 10\text{V}$	$Q_g \text{ typ @ } 10\text{V}$	Package
IRFH5250D	25V FETKY	100A	1.4 mOhm	39 nC	PQFN 5x6mm
IRFHM830D	30V FETKY	40A	4.3 mOhm	13 nC	PQFN 3x3mm
IRFH5302D	30V FETKY	100A	2.5 mOhm	26 nC	PQFN 5x6mm






## Dual MOSFET Packages








Part Number	Configuration	Voltage	$I_D @ T_A = 25^\circ\text{C}$	Package
IRF9362	DUAL P-CHANNEL	-30V	8.0A	SO-8
IRF8313	DUAL N-CHANNEL	30V	9.7A	SO-8
IRF7907	DUAL N-CHANNEL	30V	9.1A	SO-8
IRF7905	DUAL N-CHANNEL	30V	8.9A	SO-8
IRF8513	DUAL N-CHANNEL	30V	8.0A	SO-8
IRF7904	DUAL N-CHANNEL	30V	7.6A	SO-8
IRF7351	DUAL N-CHANNEL	60V	8.0A	SO-8
IRFH7911	POL ctrl and sync	30V	-	PQFN 5x6mm

\*  $I_D @ T_A = 25^\circ\text{C}$

## ONLINE IGBT SELECTION TOOL








IGBTs offer a variety of tradeoffs making it difficult to select the optimal device based on static specifications alone. To simplify the part selection process IR has released an online selection tool. This tool evaluates losses due to switching and conduction based on provided application conditions and suggests a set of IGBTs that meet the design criteria. It provides relative losses of various devices as well as MSRP so a basic cost benefit analysis can be performed. Check it out at: [mypower.irf.com/IGBT](http://mypower.irf.com/IGBT)

IGBTs Part numbers noted (D) are available with or without diode									
Voltage	Ic @ 100C	Vce-on (max)	Max Frequency	Tsc					
V	A	V	kHz	uS	TO-247	Super-247	TO-262	D²pak	TO-220
1200	90	2.3	25	10		IRG7PSH73K10			
1200	60	2.75	15	10		IRGPS60B120K(D)			
1200	50	2	25		IRG7PH50U	IRG7PSH50U(D)			
1200	50	2.7	25			IRG4PSH71U(D)			
1200	42	3.9	25	10		IRG4PSH71K(D)			
1200	40	2	30		IRG7PH46U(D)				
1200	40	3.5	30	10		IRGPS40B120U(D)			
1200	33	1.7	1		IRG4PH50S				
1200	30	2	30		IRG7PH42U(D)				
1200	30	2.28	15	10	IRGP30B120KD-E				
1200	24	3.5	20	10	IRG4PH50K(D)				
1200	24	3.7	20		IRG4PH50U(D)				
1200	20	2	30		IRG7PH35U(D)				
1200	20	3.05	30	10	IRGP20B120U(D)-E				
1200	15	3.4	20	10	IRG4PH40K(D)				
1200	15	3.5	20		IRG4PH40U(D)				
1200	10	2.35	25	10	IRG7PH30K10(D)				
1200	10	4.2	20	10	IRG4PH30K(D)				
1200	6	2	15	10					IRGB5B120KD
1200	5	3.17	20	10	IRG4PH20K(D)		IRG4BH20K-L	IRG4BH20K-S	

600V IGBTs - Part numbers noted (D) are available with or without diode											
Voltage	Ic @ 100C	Vce-on (max)	Max Frequency	Tsc							
V	A	V	kHz	uS	TO-262	DPak	D²Pak	TO-220	TO-220FP	TO-247	Super-247
600	60	1.8	12							IRG4PC60F	
600	60	2	25								IRG4PSC71U(D)
600	60	2.3	25	10							IRG4PSC71K(D)
600	48	2.14	35	3						IRGP4063(D)	
600	48	2.14	35	3						IRGP4068D	
600	42	2.2	50	10						IRGP50B60PD1	
600	41	1.36	1							IRG4PC50S(D)	
600	40	2	25							IRG4PC60U	
600	39	1.6	12							IRG4PC50F(D)	

# PRODUCT CATALOG | IGBTs

## 600V IGBTs - Part numbers noted (D) are available with or without diode

Voltage	Ic @ 100C	Vce-on (max)	Max Frequency	Tsc							
V	A	V	kHz	µS	TO-262	DPak	D²Pak	TO-220	TO-220FP	TO-247	Super-247
600	35	1.9	25	3						IRGP4069(D)	
600	34	2.25	50	10						IRGP35B60PD	
600	31	1.5	1					IRG4BC40S		IRG4PC40S	
600	30	2.35	20	10	IRGSL30B60K		IRGS30B60K	IRGB30B60K			
600	30	2.2	25	10						IRG4PC50K(D)	
600	30	2.35	20	10						IRGP30B60KD-E	
600	27	1.7	12					IRG4BC40F		IRG4PC40F(D)	
600	27	2	25							IRG4PC50U(D)	
600	27	2.3	35							IRG4PC50W	
600	25	2.6	25	10				IRG4BC40K		IRG4PC40K(D)	
600	24	1.9	35	3	IRGSL4062D		IRGS4062D	IRGB4062D	IRGI4062D	IRGP4062D	
600	22	2.35	50	10				IRGB20B60PD1		IRGP20B60PD	
600	20	2.1	25					IRG4BC40U		IRG4PC40U(D)	
600	20	2.5	35		IRG4BC40W-L		IRG4BC40W-S	IRG4BC40W		IRG4PC40W	
600	18	1.6	1				IRG4BC30S-S	IRG4BC30S	IRG4IBC30S	IRG4PC30S	
600	18	1.95	35	3				IRGB4061D	IRGI4061D		
600	17	1.8	12				IRG4BC30FD-S	IRG4BC30F(D)	IRG4IBC30FD	IRG4PC30F(D)	
600	16	2.7	25	10			IRG4BC30K(D)-S	IRG4BC30K(D)	IRG4IBC30KD	IRG4PC30K(D)	
600	15	2.2	20	10	IRGSL15B60KD		IRGS15B60KD	IRGB15B60KD	IRGIB15B60KD1		
600	12	1.85	35	3			IRGS4056D	IRGB4056D	IRGI4056D		
600	12	1.95	25				IRG4BC30U-S	IRG4BC30U(D)	IRG4IBC30UD	IRG4PC30U(D)	
600	12	2.1	35				IRG4BC30W-S	IRG4BC30W	IRG4IBC30W	IRG4PC30W	
600	12	2.2	20	10	IRGSL10B60KD		IRGS10B60KD	IRGB10B60KD	IRGIB10B60KD1		
600	11	2.1	12	10			IRG4BC20MD-S	IRG4BC20MD			
600	10	1.4	1				IRG4BC20SD-S	IRG4BC20S(D)			
600	10	1.91	35	3				IRGB4064D	IRGI4064D		
600	9	2	12			IRG4RC20F		IRG4BC20F(D)	IRG4IBC20FD		
600	9	2.2	20	10			IRGS8B60K	IRGB8B60K			
600	9	2.3	12	10				IRG4BC15MD			
600	9	2.8	25	10			IRG4BC20K(D)-S	IRG4BC20K(D)	IRG4IBC20KD		
600	8	1.7	1		IRG4BC10SD-L	IRG4RC10S(D)	IRG4BC10SD-S	IRG4BC10S(D)			
600	8	1.85	35	3				IRGB4060D	IRGI4060D		
600	8	2.2	20	10					IRGIB7B60KD		
600	7.8	2.4	25		IRG4BC15UD-L		IRG4BC15UD-S	IRG4BC15UD			
600	7	2	20	10	IRGSL6B60KD		IRGS6B60K(D)	IRGB6B60K(D)	IRGIB6B60KD		
600	6.8	2.5	20	10	IRGSL4B60KD1		IRGS4B60K(D)	IRGB4B60K(D)			
600	6.5	2.1	25				IRG4BC20UD-S	IRG4BC20U(D)	IRG4IBC20UD	IRG4PC20U	
600	6.5	2.6	35				IRG4BC20W-S	IRG4BC20W	IRG4IBC20W		
600	6	2	35	3				IRGB4045D	IRGI4045D		
600	5	2.6	25			IRG4RC10U(D)		IRG4BC10UD			
600	5	2.62	25	10		IRG4RC10K(D)		IRG4BC10K(D)			
600	4.2	2.4	20	10		IRGR3B60KD2					
600	4	2.05	35	3				IRGB4059D	IRGI4059D		
600	3.9	2.15	25						IRG4IBC10UD		

## 6 & 7 Channel Drivers for Three-Phase Systems

VOffset (V)	Features		Base Product	DIP28	SOIC28	PLCC44	MLPO 7X7
600	3 Phase Bridge Gate Driver	Active Low	IRS2336D		X	X	X
		Active High	IRS23364D		X	X	
			IRS2336		X		X
	3 Phase Bridge Gate Driver w/ Integrated OpAmp	w/ integrated BS diodes	IRS2330D		X	X	
			IRS2332D				
			IRS2330		X	X	
	IRS2332						
	3 Phase Bridge Gate Driver & PFC Driver or Brake Driver, Ground Fault Protection, w/ integrated BS diode Function		IRS26302D			X	
	3 Phase Bridge Gate Driver, Ground Fault Protection, w/ integrated BS diodes, and DC Bus Sensing, Overvoltage Protection		IRS26311D			X	
1200	3 Phase Bridge Gate Driver		IR2233 IR2235	X	X	X	

## Single Channel Drivers

Topologies	VOffset (V)	Features		Base Product	SOIC8	DIP8	SOIC16N	SOIC16	
High Side Drivers and with Over Current Shutdown	500	Current Sensing Single Channel Driver, Iout 1A/2A		IR2125		X		X	
	600	Iout 4A	UVLO_Vcc&VBS	IRS21850	X				
		Iout 300 / 600 mA	IN	IN Vth 9.5 / 6V	IRS2117	X	X		
				IN Vth 2.5 / 0.8V	IRS21171	X			
			IN/N	IN Vth 9.5 / 6V	IRS2118	X	X		
		Over Current Shutdown	Iout 200 / 420mA	Output in Phase with Input	IRS2127	X			
Output out Phase with Input	IRS2128			X					
Dual High Side Driver	600	Dual High Side Driver, Iout 4A, UVLO_Vcc&VBS		IRS21853			X		
Low Side Drivers	5	Current Limiting Low Side Driver, Iout 1A/2A		IR2121		X			
		Dual Low Side Drivers	Output out Phase with Input	IR4426	X	X			
			Output in Phase with Input	IR4427	X	X			
			Output out Phase with InputA and in Phase with InputB	IR4428	X	X			
Current Sensing IC	600	Linear Current Sensing		IR2175	X	X			
		Phase Current Sensor IC		IR2177				X	
	1200	Phase Current Sensor IC		IR2277				X	

# PRODUCT CATALOG | HVICs

Independent Channels	VOffset (V)	Main Features			Base Product	SOIC8	DIP8	MLPQ4x4	SOIC14	DIP14	SOIC16	SOIC16N	SSOP24		
Independent Channels	200	Iout 290 / 600 mA			IRS2001	X	X								
		Iout 1A			IRS2011	X	X								
		Iout 3A			IR2010				X	X					
	500	Iout 2.5A		Shutdown	VSS/COM	UVLO_Vcc&VBS	IRS2113		X	X	X				
	600	Iout 290 / 600 mA	COM	UVLO_Vcc		IRS2101	X	X							
				UVLO_Vcc&VBS		IRS2301	X	X							
			VSS/COM	UVLO_Vcc&VBS		IRS21064				X	X				
				Shutdown	VSS/COM	UVLO_Vcc&VBS	IRS2112					X	X		
		Iout 2A	COM	UVLO_Vcc&VBS	IRS2181	X	X								
			VSS/COM	UVLO_Vcc&VBS	IRS21814			X	X	X					
		Iout 2.5A	Shutdown	VSS/COM	UVLO_Vcc&VBS	IRS2113			X	X	X				
		Iout 4A	COM	UVLO_Vcc&VBS	IRS2186	X	X								
			VSS/COM	UVLO_Vcc&VBS	IRS21864				X	X					
		HS & LS Drivers with Integrated BS Diode and Enhanced -Vs immunity				IRS2607D	X	X							
	1 HS and 2 LS Drivers				IRS21952								X		
				IRS21953								X			
1200	Iout 2A		Output in Phase with Input		IR2213				X	X					
Interconnected Channels (Dead-Time)	200	Half Bridge with Fixed DT	HIN,LIN/N	Iout 300 / 600 mA	IRS2003	X	X								
			IN, SD/N		IRS2004	X	X								
	600	Half Bridge with Fixed DT, Iout 300 / 600 mA, and UVLO_VCC/VBS unless specified	HIN, LIN/N	UVLO_Vcc	IRS2103	X	X								
				Iout 2A	IRS2183	X	X								
			IN, SD/N		IRS2108	X	X								
					IRS2104	X	X								
					IRS2184	X	X								
					IRS2109	X	X								
			IN, no SD		IRS2111	X	X								
			HIN, LIN	W / Different DT	IRS2304	X	X								
			IRS2308												
	1200	Half Bridge with Fixed DT & Iout 1.5A	DSH/L Passive Biased		IR2114S								X		
			DSH, HSL Active Biased		IR21141S								X		
	600	Half Bridge with Programmable DT, Iout 300 / 600 mA, Ground Pins VSS/COM unless specified	HIN, LIN/N	Iout 2A	IRS2108				X	X					
					IRS21834				X	X					
IN, SD/N			Iout 2A	IRS21094					X	X					
				IRS21844			X	X	X						
IN, SD/N			Ground - COM	IRS21091				X	X						
600	Half Bridge with Integrated BS Diode function, enhanced -Vs immunity	HIN, LIN/N		IRS2608D	X	X									
		IN, SD/N		IRS2609D	X	X									

## AUTOMOTIVE-GRADE POWER MANAGEMENT SOLUTIONS

- AEC-Q100 & AEC-Q101 qualified products
- Dedicated automotive processes
- Zero defect initiative

Intelligent Power Switches									
Topology	R <sub>DS(on)</sub> mOhm	V clamp V	OverCurrent Protection		Package				
			Typ value (A)	Type	T0220	D <sup>2</sup> Pak	DPak	SOIC	SOT233
Single Low Side	13	39	85	Shutdown	AUIPS1011	AUIPS1011S	AUIPS1011R		
	25	36	35	Shutdown	AUIPS1021	AUIPS1021S	AUIPS1021R		
	50	36	18	Shutdown	AUIPS1031	AUIPS1031S	AUIPS1031R		
	100	39	6	Shutdown			AUIPS1041R		AUIPS1041L
	200	39	3	Shutdown					AUIPS1051L
	60	68	14	Shutdown			AUIPS2031R		
	130	68	5	Shutdown			AUIPS2041R		AUIPS2041L
Dual Low Side	300	70	1.8	Shutdown					AUIPS2051L
	2*100	39	6	Shutdown				AUIPS1042G	
	2*200	39	3	Shutdown				AUIPS1052G	
	2*300	70	1.8	Shutdown				AUIPS2052G	
Topology	R <sub>DS(on)</sub> mOhm	V clamp V	OverCurrent Protection		Package				
			Typ value (A)	Type	T0220	D <sup>2</sup> Pak	DPak	SOIC	SOT223
Single High Side	14	39	55	Limit	AUIPS6011	AUIPS6011S	AUIPS6011R		
	30	39	32	Limit	AUIPS6021	AUIPS6021S	AUIPS6021R		
	55	39	16	Limit	AUIPS6031	AUIPS6031S	AUIPS6031R		
	130	39	6.5	Limit	AUIPS6041	AUIPS6041S	AUIPS6041R	AUIPS6041G	
	70	70	7	Limit	AUIPS7081	AUIPS7081S	AUIPS7081R		
	120	70	5	Limit	AUIPS7091	AUIPS7091S		AUIPS7091G	
Dual High Side	2*100	65	25	Shutdown				AUIPS7142G	
Quad High Side	4*130	39	6.5	Limit				AUIPS6044G	
I sense High Side	7	40	10 to 90	Shutdown	AUIR3313	AUIR3313S			
	12	40	6 to 60	Shutdown	AUIR3314	AUIR3314S			
	20	40	3 to 30	Shutdown	AUIR3315	AUIR3315S			
	7	40	10 to 90	Shutdown	AUIR3316	AUIR3316S			
	7	40	120	Shutdown	AUIR3317	AUIR3317S			
	30	65	60	Shutdown			AUIPS7121R		
	30	65	60	Shutdown			AUIPS7125R		
	100	65	25	Shutdown			AUIPS7145R		
	100	65	7	Shutdown				AUIPS71411G	
PWM High Side	7.5	65	45	Shutdown		AUIPS7111S			
	3.5	40	10 to 40	Shutdown		AUIR33401S			
	3.5	40	10 to 40	Shutdown		AUIR3330S			
100Khz High Side	3.5	40	10 to 40	Shutdown		AUIR3340S			
	40	70	30	Shutdown			AUIPS7221R		
	40	70	30	Shutdown			AUIPS72211R		

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## High-Voltage ICs

Part	Application	Voltage	Package	Output Source / Sink Current	Vcc Range	Vbs Range	Typ. Prop Delay	Features
AUIRS2334S	3-phase Inverter Drivers	600V	SOIC20	+290 / -600mA	10-20V w/UVLO	10-20V w/UVLO	530/530ns On/Off	Under voltage lockout, 3.3V logic input, independent half-bridge drivers, shoot through protection, tolerant to negative transient voltage, matched propagation delays, fixed deadtime, separate low and high side inputs in-phase with output
AUIRS2336S	3-phase Inverter Drivers	600V	SOIC28	+200 / -350mA	10-20V w/UVLO	10-20V w/UVLO	530/530ns On/Off	Under voltage lockout, over current and temperature shutdown, 3.3V logic input, cross conduction prevention logic, tolerant to negative transient voltage, adjustable fault clear timing, separate logic and power grounds, advanced input filter
AUIRS20302S	3-phase Inverter Drivers with PFC/ Brake Driver	200V	SOIC28	+200 / -350mA	6-20V w/UVLO	6-20V w/UVLO	700/700ns On/Off	Full three phase gate driver, Under-voltage lockout for all channels, Cross-conduction prevention logic, Charge pump for pre-regulator N-ch Mosfet, Power-on reset, FAULT mode operation, Current sense comparator, 3.3V logic compatible, Matched propagation delay for all channels, Fully operational up to +200V, Floating channels for bootstrap operation, Tolerant to negative transients (-dV/dt immune), Lower di/dt gate drive for better noise immunity
AUIRS2332J	3-phase Inverter Drivers	600V	PLCC44	+200 / -420mA	10-20V w/UVLO	10-20V w/UVLO	500/500ns On/Off	Under voltage lockout, 3.3V logic input, independent half-bridge drivers, tolerant to negative transient voltage, matched propagation delays, over current shutdown turn off all 6 switches, output out of phase with input, integrated op-amp
AUIRS2004S	Dual Channel High- and Low- Side Drivers	200V	SOIC8	+130 / -270mA	10-20V w/UVLO	10-20V w/UVLO	680/150ns On/Off	Under voltage lockout, 3.3V, 5V, and 15V input logic compatible, matched propagation delay, cross conduction prevention
AUIRS2110S	Dual Channel High- and Low- Side Drivers	500V	SOIC16	+2.5A / -2.5A	10-20V w/UVLO	10-20V w/UVLO	140/120ns On/Off	Under voltage lockout, 3.3V input logic compatible, separate logic supply from 3.3V to 20V, CMOS Schmitt-triggered inputs with pull-down, matched propagation delay, separate logic and power ground, 10ns delay matching

Coming in 2011



High-Voltage ICs								
Part	Application	Voltage	Package	Output Source / Sink Current	Vcc Range	Vbs Range	Typ. Prop Delay	Features
AUIRS2112S	Dual Channel High- and Low- Side Drivers	600V	SOIC16	+290 / -600mA	10-20V w/UVLO	10-20V w/UVLO	140/140ns On/Off	Under voltage lockout, 3.3V input logic compatible, separate logic supply from 3.3V to 20V, CMOS Schmitt-triggered inputs with pull-down, matched propagation delay, separate logic and power ground, 30ns delay matching
AUIRS2113S	Dual Channel High- and Low- Side Drivers	600V	SOIC16	+2.5A / -2.5A	10-20V w/UVLO	10-20V w/UVLO	140/120ns On/Off	Under voltage lockout, 3.3V input logic compatible, separate logic supply from 3.3V to 20V, CMOS Schmitt-triggered inputs with pull-down, matched propagation delay, separate logic and power ground, 20ns delay matching
AUIRS2181S	Dual Channel High- and Low- Side Drivers	600V	SOIC8	+1.9A / -2.3A	10-20V w/UVLO	10-20V w/UVLO	160/200ns On/Off	Under voltage lockout, 3.3V, 5V input logic compatible, matched propagation delay
AUIRS21811S	Dual Channel High- and Low- Side Drivers	600V	SOIC8	+1.9A / -2.3A	10-20V w/UVLO	10-20V w/UVLO	135/135ns On/Off	Under voltage lockout, 3.3V, 5V input logic compatible, CMOS Schmitt-triggered inputs, matched propagation delay, lower di/dt gate driver for better noise immunity
AUIRS21814S	Dual Channel High- and Low- Side Drivers	600V	SOIC14	+1.9A / -2.3A	10-20V w/UVLO	10-20V w/UVLO	160/200ns On/Off	Under voltage lockout, 3.3V, 5V input logic compatible, matched propagation delay, separate logic and power ground
AUIRS2191S	Dual Channel High- and Low- Side Drivers	600V	SOIC16	+3.5A / -3.5A	10-20V w/UVLO	10-20V w/UVLO	90/90ns On/Off	Under voltage lockout for both channels, 3.3V, 5V and 15V input logic compatible, matched propagation delay, CMOS Schmitt-triggered inputs with pull-down
AUIRS2301S	Dual Channel High- and Low- Side Drivers	600V	SOIC8	+120 / -250mA	5-20V w/UVLO	5-20V w/UVLO	220/200ns On/Off	Under voltage lockout for both channels, 3.3V, 5V and 15V input logic compatible, matched propagation delay
AUIRS2011S	Dual Channel High- and Low- Side Drivers	200V	SOIC8	+1.0 / -1.0A	10-20V w/UVLO	10-20V w/UVLO	60/60ns On/Off	Under voltage lockout for both channels, 3.3V and 5V input logic compatible, Tolerant to negative transient (-dV/dt), CMOS Schmitt-triggered inputs with pull-down
AUIRS4426S	Dual Channel Low- Side Drivers	Low side	SOIC8	+2.3A / -3.3A	6-20V w/UVLO	6-20V w/UVLO	70/65ns On/Off	3.3V, 5V input logic compatible, matched propagation delay
AUIRS4427S	Dual Channel Low- Side Drivers	Low side	SOIC8	+2.3A / -3.3A	6-20V w/UVLO	6-20V w/UVLO	50/50ns On/Off	3.3V, 5V input logic compatible, matched propagation delay

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High-Voltage ICs								
Part	Application	Voltage	Package	Output Source / Sink Current	Vcc Range	Vbs Range	Typ. Prop Delay	Features
AUIRS4428S	Dual Channel Low-Side Drivers	Low side	SOIC8	+2.3A / -3.3A	6-20V w/UVLO	6-20V w/UVLO	70/65ns On/Off	3.3V, 5V input logic compatible, matched propagation delay
AUIRS2092S	Single Channel Class-D Audio Amplifier	200V	SOIC16	+1.0 / -1.2A	10-18V w/UVLO	10-18V w/UVLO	360/335ns On/Off	Analog input, Programmable bidirectional over-current protection with self-reset, Under voltage protection, Programmable preset deadtime, reduced THD+N
AUIRS20956S	Single Channel Class-D Audio Amplifier	200V	SOIC16	+1.0 / -1.2A	10-18V w/UVLO	10-18V w/UVLO	80/65ns On/Off	Floating PWM input (non-inverting and 3.3V and 5V logic compatible), Programmable bi-directional over-current protection with self-reset, Under voltage protection, Programmable preset deadtime, improved sound quality with optimized THD+N, 200V rating delivers up to 500W output power
AUIRS20161S	Single Channel High-Side Drivers	150V	SOIC8	+250 / -250mA	4.4-20V w/UVLO	4.4-20V w/UVLO	150/150ns On/Off	One high side output and internal low side Vs recharge, CMOS Schmitt trigger inverted input with pull up resistor, CMOS Schmitt trigger inverted reset with pull down resistor, 5V compatible input logic, Under voltage lockout, immune to negative Vs spike and transient
AUIRS2117S	Single Channel High-Side Drivers	600V	SOIC8	+290 / -600mA	10-20V w/UVLO	10-20V w/UVLO	140/140ns On/Off	Under voltage lockout, Schmitt-triggered inputs with pull-down, output in phase with input
AUIRS2118S	Single Channel High-Side Drivers	600V	SOIC8	+290 / -600mA	10-20V w/UVLO	10-20V w/UVLO	140/140ns On/Off	Under voltage lockout, inverting Schmitt-triggered inputs with pull-down, output in phase with input
AUIRS2123S	Single Channel High-Side Drivers	600V	SOIC8	+500 / -500mA	10-20V w/UVLO	10-20V w/UVLO	140/140ns On/Off	CMOS Schmitt-triggered inputs with pull-down, output in phase with input
AUIRS2124S	Single Channel High-Side Drivers	600V	SOIC8	+500 / -500mA	10-20V w/UVLO	10-20V w/UVLO	140/140ns On/Off	CMOS Schmitt-triggered inputs with pull-down, output out phase with input
AUIRS2127S	Single Channel High-Side Drivers	600V	SOIC8	+290 / -600mA	12-20V w/UVLO	9-20V w/UVLO	150/150ns On/Off	Under voltage lockout, 3.3V, 5V and 15V input logic compatible, Fault output, output in phase with input
AUIRS21271S	Single Channel High-Side Drivers	600V	SOIC8	+290 / -600mA	9-20V w/UVLO	9-20V w/UVLO	150/150ns On/Off	Under voltage lockout, 3.3V, 5V and 15V input logic compatible, Fault output, output in phase with input
AUIRS2128S	Single Channel High-Side Drivers	600V	SOIC8	+290 / -600mA	10-20V w/UVLO	12-20V w/UVLO	150/150ns On/Off	Under voltage lockout, 3.3V, 5V and 15V input logic compatible, Fault output, output out of phase with input

Coming in 2011

High-Voltage ICs								
Part	Application	Voltage	Package	Output Source / Sink Current	Vcc Range	Vbs Range	Typ. Prop Delay	Features
AUIRS21281	Single Channel High-Side Drivers	600V	SOIC8	+290 / -600mA	9-20V w/UVLO	9-20V w/UVLO	150/150ns On/Off	Under voltage lockout, 3.3V, 5V and 15V input logic compatible, Fault output, output out of phase with input
AUIR2085S	Single phase Half-bridge Drivers	100V	SOIC8	+1.0 / -1.0A	10-15V w/UVLO	10-15V w/UVLO		Under voltage lockout, soft start, integrated 50% duty cycle oscillator, programmable switching frequency and dead time, adjustable deadtime, adjustable over current protection
AUIRS2003S	Single phase Half-bridge Drivers	200V	SOIC8	+290 / -600mA	10-20V w/UVLO	10-20V w/UVLO	680/150ns On/Off	Under voltage lockout, 3.3V,5V, and 15V input logic compatible, matched propagation delay, shoot-through protection
AUIRS2184S	Single phase Half-bridge Drivers	600V	SOIC8	+1.9A / -2.3A	10-20V w/UVLO	10-20V w/UVLO	600/230ns On/Off	Under voltage lockout, 3.3V and 5V input logic compatible, matched propagation delay on both channels
AUIRS21844S	Single phase Half-bridge Drivers	600V	SOIC14	+1.9A / -2.3A	10-20V w/UVLO	10-20V w/UVLO	600/230ns On/Off	Under voltage lockout, 3.3V and 5V input logic compatible, matched propagation delay on both channels, all high voltage pins on one side of package, separate logic and power ground
AUIRS2302S	Single phase Half-bridge Drivers	600V	SOIC8	+120 / -250mA	5-20V w/UVLO	5-20V w/UVLO	720/250ns On/Off	Under voltage lockout for both channels, 3.3V, 5V and 15V input logic compatible, matched propagation delay
AUIR0815S	Buffer Gate Driver	30V	SOIC8	+10 / -10A	10-20V w/UVLO		50/50ns On/Off	High peak output current 10A, Low propagation delay time, Negative turn off bias can be apply to -VE using an external supply, Soft over-current shutdown output pin, Low supply current, Matched delay outputs, Undervoltage lockout, Over temperature protection, Continuous 'on' capability

IGBTs								
Part No.	B <sub>v</sub> (V)	Diode Config	Package	SCSOA min (μsec)	I <sub>ce</sub> at 100c (A)	V <sub>CE(on)</sub> Max (V) @25C	Frequency Range	Typical Application
AUIRG4BC30S-S	600	Discrete	D <sup>2</sup> PAK	na	18	1.6	< 1 kHz	PTC heater, discharge switch and other relay replacements
AUIRG4BC30U-S	600	Discrete	D <sup>2</sup> PAK	na	12	2.1	4-30 kHz	SMPS, PFC
AUIRG4BH40S-S	1200	Discrete	D <sup>2</sup> PAK	0	26	1.47	< 1 kHz	PTC heater, discharge switch and other relay replacements

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IGBTs								
Part No.	$B_v$ (V)	Diode Config	Package	SCSOA min ( $\mu$ sec)	Ice at 100c (A)	$V_{CE(on)}$ Max (V) @25C	Frequency Range	Typical Application
AUIRG4PH50S	1200	Discrete	TO-247	10	33	1.7	< 1 kHz	PTC heater, discharge switch and other relay replacements
AUIRGP35B60PD(E)	600	Co-Pack	TO-247	10	35	1.85	20-50 kHz	SMPS, PFC
AUIRGP50B60PD1(E)	600	Co-Pack	TO-247	10	50	2.35	20-50 kHz	SMPS, PFC
AUIRGS30B60K	600	Discrete	D <sup>2</sup> PAK	10	50	2.35	4-16 kHz	SMPS, PFC
AUIRGR4045D	600	Co-Pack	DPAK	5	6	2	4-30 kHz	HID
AUIRGS4056D	600	Co-Pack	D <sup>2</sup> PAK	5	12	1.85	4-30 kHz	Injection, motor drive
AUIRG(B,P,SL)4062D(E)	600	Co-Pack	TO220, TO247, D <sup>2</sup> PAK	5	24	1.95	4-30 kHz	HV AC motor drive
AUIRGP4063D(E)	600	Co-Pack	TO247	5	48	2.14	4-30 kHz	HV AC motor drive
AUIRGP4066D(1)(E)	600	Co-Pack	TO247	5	75	1.7	4-30 kHz	High power inverter
AUIRGPS4067D1	600	Co-Pack	Super247	10	160	2.05	4-30 kHz	High power inverter
AUIRG7CH73K10B	1200	Discrete	die sale	10	75	2.3	4-16 kHz	High power inverter
AUIRG7CH73K6B	1200	Discrete	die sale	6	75	2.2	4-16 kHz	High power inverter
AUIRG7CH80K6B-M	1200	Discrete	die sale (SFM)	6	200	2.45	4-30 kHz	High power inverter

All IGBT parts have die sale options

DirectFET <sup>®</sup> 2								
$V_{(BR)DSS}$ (V)	$R_{DS(on)}$ MAX. @ 10VGS (mOhm)	$I_D$ MAX @ TC = 25°C (A)	$Q_g$ TYP. @ 10VGS (nC)	Pad Outline	Optimized Feature	Package		
						Small Can	Medium Can	Large Can
40	1.0	270	220	L8	Low $R_{DS(on)}$			AUIRF7739L2
40	1.6	210	147	L6	Low $R_{DS(on)}$			AUIRF7738L2
40	1.9	156	89	L6	Low $R_{DS(on)}$			AUIRF7737L2
40	2.9 <sup>1</sup>	143	59 <sup>1</sup>	M4	Low $R_{DS(on)}$		AUIRL7736M2	
40	6.4 <sup>1</sup>	65	24 <sup>1</sup>	SC	Low $R_{DS(on)}$	AUIRL7732S2		
60	7.0	86	36	M4	Low Qg		AUIRF7648M2	
60	34.6	32	7	SB	Low Qg	AUIRF7640S2		
100	4.6	118	112	L8	Low Qg			AUIRF7669L2
100	31.7	40	16	SC	Low Qg	AUIRF7647S2		
100	62.0	14	8	SB	Low Qg	AUIRF7665S2		
150	56.0	28	25	M2	Low Qg		AUIRF7675M2	

<sup>1</sup> Values at VGS = 4.5V

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## N Channel MOSFETs

V <sub>(BR)</sub> DSS (V)	R <sub>DS(ON)</sub> MAX. @ 10Vgs (mΩ)	R <sub>DS(ON)</sub> MAX. @ 4.5Vgs (mΩ)	I <sub>D</sub> MAX @ T <sub>c</sub> = 25°C (A)	Q <sub>G</sub> TYP @ 10Vgs (nC)	Q <sub>G</sub> TYP @ 4.5Vgs (nC)	Package											
						SOT-223	SO-8	DPak	D <sup>2</sup> Pak	D <sup>2</sup> Pak-7	IPak	TO-220	TO-262	TO-220 Full Pak	TO-247		
20	20.0	28.0	36		7			AUIRLR3714									
24	1.0		429	180						AUIRF1324S-7P							
24	1.7		340	160					AUIRF1324S								
24	1.5		353	160								AUIRF1324S					
30	2.4		260	160					AUIRF2903ZS								
30	7.0	10.0	116		60				AUIRL2203NS								
30	45.0	65.0	22		15			AUIRLR2703									
40	1.3		400	160						AUIRFS3004-7P							
40	1.4	1.7	380		120					AUIRLS3034-7P							
40	1.6		320	170						AUIRF2804S-7P							
40	1.7		350	220													AUIRFP4004
40	1.7	2.0	343		108				AUIRLS3034			AUIRLB3034					
40	1.8		340	160					AUIRFS3004			AUIRFB3004					
40	2.0		270	160					AUIRF2804S			AUIRF2804	AUIRF2804L				
40	3.1	5.9	180		75*				AUIRL1404ZS			AUIRL1404Z	AUIRL1404ZL				
40	3.4		180	100					AUIRF1404ZS			AUIRF1404Z	AUIRF1404ZL				
40	4.0		162	160					AUIRF1404S			AUIRF1404					
40	4.0		160	93					AUIRL1404S								
40	4.9	6.5			40			AUIRLR3114Z									
40	5.5		120	68					AUIRF4104S								
40	5.5		119	59				AUIRFR4104				AUIRFU4104					
40	5.5		120	68								AUIRF4104					
40	9.0		77	30				AUIRFR3504Z									
40	9.2		87	48				AUIRFR3504									
55	2.6		240	130							AUIRF3805S-7P						
55	3.3		210	190						AUIRF3805S			AUIRF3805	AUIRF3805L			
55	4.7		175	150									AUIRF2805				
55	4.7		135	150					AUIRF2805S								
55	4.9		150	120					AUIRF1405ZS					AUIRF1405ZL			
55	5.0		174	170								AUIRFBA1405P					
55	5.3		160	120													AUIRFP1405
55	5.3		133	170								AUIRF1405					
55	6.5		110	76					AUIRF3205ZS			AUIRF3205Z					
55	7.5		94	63					AUIRF1010ZS			AUIRF1010Z	AUIRF1010ZL				
55	8.0		140	100								AUIRF3305					
55	8.0		56	113													AUIRFI3205

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## N Channel MOSFETs

V <sub>(BR)</sub> DSS (V)	R <sub>DS(ON)</sub> MAX. @ 10Vgs (mΩ)	R <sub>DS(ON)</sub> MAX. @ 4.5Vgs (mΩ)	I <sub>D</sub> MAX @ T <sub>c</sub> = 25°C (A)	Q <sub>G</sub> TYP @ 10Vgs (nC)	Q <sub>G</sub> TYP @ 4.5Vgs (nC)	Package										
						SOT-223	SO-8	DPak	D <sup>2</sup> Pak	D <sup>2</sup> Pak-7	IPak	TO-220	TO-262	TO-220 Full Pak	TO-247	
55	8.0		98	97								AUIRF3205				
55	8.0		98	113												AUIRFP064N
55	8.0	12.0	89		44*			AUIRLR3705Z								
55	8.0	12.0	86		40*				AUIRL3705ZS				AUIRL3705ZL			
55	8.0	13.0	58		130*										AUIRLI2505	
55	10.0	18.0	89		98*				AUIRL3705NS							
55	11.0		62	40				AUIRFR48Z								
55	11.0		61	43					AUIRFZ48ZS			AUIRFZ48Z				
55	13.5	22.5	60		23*			AUIRLR2905Z								
55	13.5	22.5	51		24*							AUIRLZ44Z				
55	13.9		51	29					AUIRFZ44ZS			AUIRFZ44Z				
55	14.0		64	54								AUIRFZ48N				
55	14.0	17.0	61	61				AUIRLR3915								
55	14.5		59	29				AUIRFR2905Z								
55	16.5		53	48									AUIRFZ46NL			
55	17.5		41	42								AUIRFZ44N				
55	24.0		28	43											AUIRFZ44N	
55	24.5		30	18				AUIRFR4105Z								
55	27.0	40.0	36		48*			AUIRLR2905								
55	37.0	43.0	25		20*			AUIRLR3105								
55	40.0	65.0	5	32			AUIRLL2705									
55	40.0		19	23											AUIRFZ34N	
55	40.0		26	23								AUIRFZ34N				
55	45.0		25	23				AUIRFR4105								
55	58.0	100.0	16		7*			AUIRLR024Z								
55	65.0	100.0	4		10*	AUIRLL024N										
55	65.0	110.0	17		15*			AUIRLR024N								
55	70.0		17	13					AUIRFZ24NS							
55	75.0		16	13				AUIRFR024N								
55	75.0		3	12		AUIRFL024N										
55	140.0	210.0	10		7.9*			AUIRLR014N								
55	140.0	280.0	3	10		AUIRLL014N										
55	160.0		2	7		AUIRFL014N										
60	1.9	2.2	300		110					AUIRSL3036-7P						
60	2.1		293	200						AUIRFS3006-7P						
60	2.4	2.8	270		91				AUIRSL3036			AUIRLB3036				

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## N Channel MOSFETs

V <sub>(BR)</sub> DSS (V)	R <sub>DS(ON)</sub> MAX. @ 10Vgs (mΩ)	R <sub>DS(ON)</sub> MAX. @ 4.5Vgs (mΩ)	I <sub>D</sub> MAX @ T <sub>c</sub> = 25°C (A)	Q <sub>G</sub> TYP @ 10Vgs (nC)	Q <sub>G</sub> TYP @ 4.5Vgs (nC)	Package										
						SOT-223	SO-8	DPak	D <sup>2</sup> Pak	D <sup>2</sup> Pak-7	IPak	TO-220	TO-262	TO-220 Full Pak	TO-247	
60	2.5		270	200					AUIRFS3006			AUIRFB3006				
60	3.0		210	120								AUIRFB3206	AUIRFSL3206			
60	3.0		200	120					AUIRFS3206							AUIRFP3206
60	4.2		160	85					AUIRFS3306			AUIRFB3306				AUIRFP3306
60	6.8	8.3	99		33				AUIRLR3636							
60	8.4		79	46					AUIRFR1018E	AUIRF1018ES		AUIRF1018E				
60	8.5		84	58					AUIRF1010EVS			AUIRF1010EZ				
60	9.4		12	26				AUIRF7855								
60	12.0		57	43					AUIRFZ44VZS							
60	15.8		43	22					AUIRFR3806	AUIRFS3806		AUIRFB3806				
60	16.5		55	45								AUIRFZ44V				
60	26.0	30.0	7	10				AUIRF7478Q								
75	1.8		350	380												AUIRFP4368
75	2.6		260	160						AUIRFS3107-7P						
75	3.0		230	160					AUIRFS3107							
75	3.3		210	160								AUIRFB3077				
75	3.3		200	160												AUIRFP3077
75	3.8		160	170						AUIRF2907ZS-7P						
75	4.1		170	120					AUIRFS3207Z			AUIRFB3207Z				
75	4.5		180	180								AUIRFB3207				
75	4.5		177	410												AUIRFP2907
75	4.5		170	180								AUIRF2907Z				AUIRFP2907Z
75	5.8		120	79					AUIRFS3307Z			AUIRFB3307Z				
75	7.0		140	150								AUIRF3808				
75	7.0		105	150					AUIRF3808S							
75	9.0		80	56					AUIRFR3607	AUIRFS3607		AUIRFB3607				
75	12.6		80	89								AUIRF3007				
75	13.0		82	107								AUIRF2807				
75	16.0		53	50					AUIRFR2307Z							
75	22.0		45	34					AUIRFR2607Z							
75	26.0		42	74					AUIRFR2407							
80	28.0	30.0	39		22				AUIRLR2908							
100	2.6		290	360												AUIRFP4468
100	3.9	4.1	190		93					AUIRLS4030-7P						
100	4.0		190	150						AUIRFS4010-7P						
100	4.3	4.5	180		87				AUIRLS4030			AUIRLB4030				

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## N Channel MOSFETs

V <sub>(BR)</sub> DSS (V)	R <sub>DS(ON)</sub> MAX. @ 10Vgs (mΩ)	R <sub>DS(ON)</sub> MAX. @ 4.5Vgs (mΩ)	I <sub>D</sub> MAX @ T <sub>c</sub> = 25°C (A)	Q <sub>G</sub> TYP @ 10Vgs (nC)	Q <sub>G</sub> TYP @ 4.5Vgs (nC)	Package										
						SOT-223	S0-8	DPak	D <sup>2</sup> Pak	D <sup>2</sup> Pak-7	IPak	TO-220	TO-262	TO-220 Full Pak	TO-247	
100	4.5		180	150								AUIRFB4110				AUIRFP4110
100	4.7		180	143					AUIRFS4010							
100	6.0		134	120												AUIRFP4310Z
100	6.0		127	120					AUIRFS4310Z			AUIRFB4310Z				
100	7.0		140	170					AUIRFS4310				AUIRFSL4310			
100	9.0		97	83					AUIRFS4410Z			AUIRFB4410Z				AUIRFP4410Z
100	10.0		96	120								AUIRFB4410				
100	14.0	16.0	63		34				AUIRLR3110Z			AUIRLU3110Z				
100	14.0		73	90					AUIRFS4610			AUIRFB4610				
100	18.0		59	82					AUIRF3710ZS			AUIRF3710Z				
100	18.0		56	69					AUIRFR3710Z							
100	26.0		55	93					AUIRL2910S							
100	26.5		36	42					AUIRF540ZS			AUIRF540Z				
100	105.0	155.0	15	23	34*				AUIRLR3410							
100	185.0	265.0	11		20*				AUIRLR120N							
100	190.0		9	7					AUIRFR120Z							
150	5.9		171	151												AUIRFP4568
150	11.0		104	77								AUIRFB4115				
150	11.8		105	73						AUIRFS4115-7P						
150	12.1		99	77					AUIRFS4115							
150	15.0		83	71					AUIRFS4321			AUIRFB4321				
150	42.0		43	133								AUIRF3415				
150	39.0		25	26								AUIRFB4615				
150	42.0		33	26					AUIRFR4615	AUIRFS4615						
200	9.7		130	161												AUIRFP4668
200	20.0		76	100								AUIRFB4127				
200	22.0		72	100					AUIRFS4127							
200	25.0		65	70												AUIRFP4227
200	26.0		65	70								AUIRFB4227				
200	26.0		62	70									AUIRFSL4227			
200	72.5		25	25								AUIRFB4620				
200	78.0		24	25					AUIRFR4620	AUIRFS4620						
250	17.5		93	180												AUIRFP4768
250	33.0		60	99								AUIRFB4332				

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## N Channel MOSFETs

V <sub>(BR)</sub> DSS (V)	R <sub>DS(ON)</sub> MAX. @ 10Vgs (mΩ)	R <sub>DS(ON)</sub> MAX. @ 4.5Vgs (mΩ)	I <sub>D</sub> MAX @ T <sub>c</sub> = 25°C (A)	Q <sub>G</sub> TYP @ 10Vgs (nC)	Q <sub>G</sub> TYP @ 4.5Vgs (nC)	Package								
						SOT-223	S0-8	DPak	D <sup>2</sup> Pak	D <sup>2</sup> Pak-7	IPak	TO-220	TO-262	TO-220 Full Pak

## P Channel MOSFETs

-30	20.0	35.0	-10	61			AUIRF7416Q									
-55	20.0		-74	120					AUIRF4905S			AUIRF4905	AUIRF4905L			
-55	65.0		-28	42			AUIRFR5305									
-55	100.0		-17	23								AUIRF9Z34N				
-55	110.0		-18	21			AUIRFR5505									
-55	175.0		-11	13			AUIRFR9024N									
-100	60.0		-38	150					AUIRF5210S							
-100	117.0		-23	65								AUIRF9540N				
-100	205.0		-13	39			AUIRFR5410									
-150	580.0		-13	44			AUIRFR6215									

## Dual N Channel MOSFETs

30	50.0	80.0	5	17			AUIRF7303Q									
50	130.0	200.0	3	10			AUIRF7103Q									
55	50.0	65.0	5	29			AUIRF7341Q									

## Dual P Channel MOSFETs

-20		90.0	-4		22		AUIRF7304Q									
-30	58.0	98.0	-5	23			AUIRF7316Q									
-55	105.0	170.0	-3	26			AUIRF7342Q									

## N + P Channel Paired MOSFETs

30	45 / 90	75/180	58/43	25/25			AUIRF7379Q									
30	50/100	80/160	47/35		25/25		AUIRF7309Q									
30	100/250	150/400	35/23	6.9/6.1			AUIRF9952Q									
55	50/105	65/170	47/34	2 / 26			AUIRF7343Q									

\* Qg at 5Vgs

\*\* Super TO-220 (TO-273AA)

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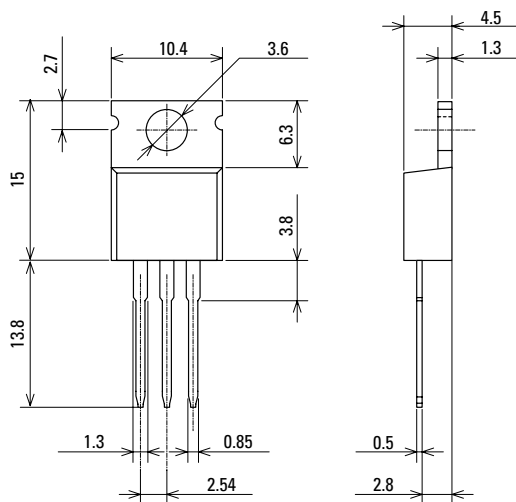


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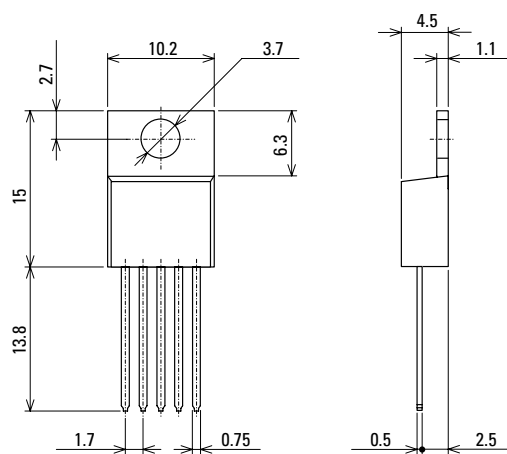




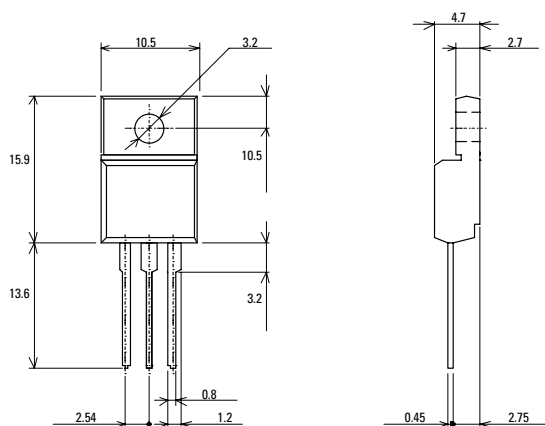
## TO-220



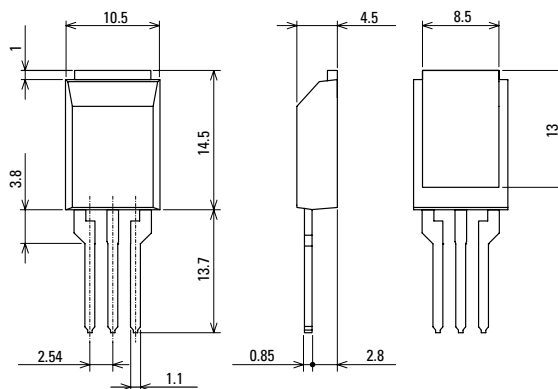
## TO-220 5 Lead



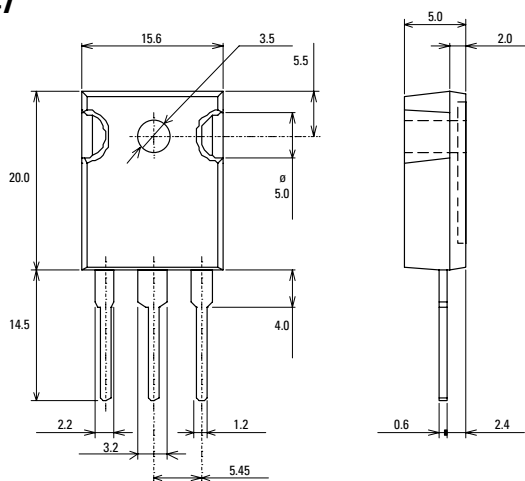
## TO-220 Full-Pak



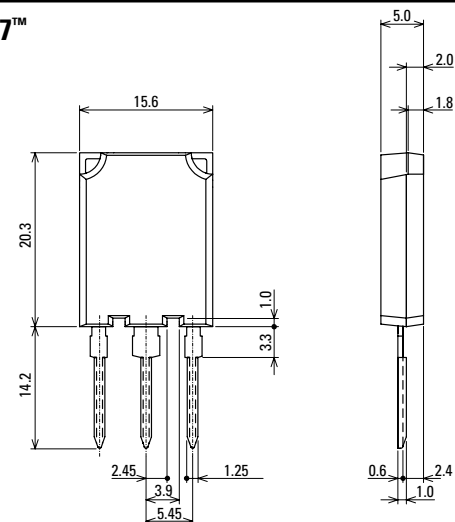
## Super-220™



## TO-247

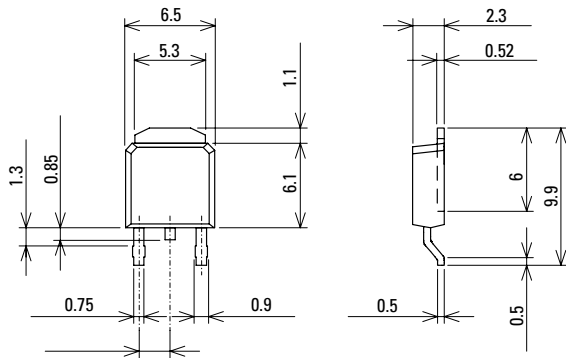


## Super-247™

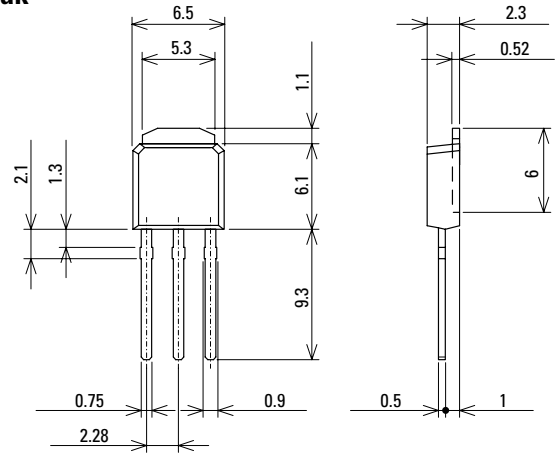


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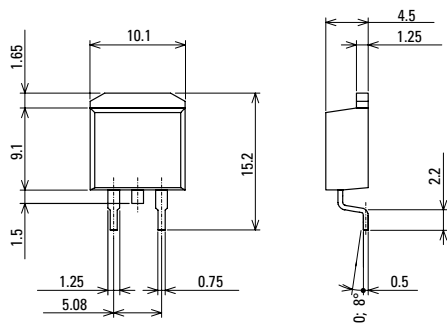
## D-Pak



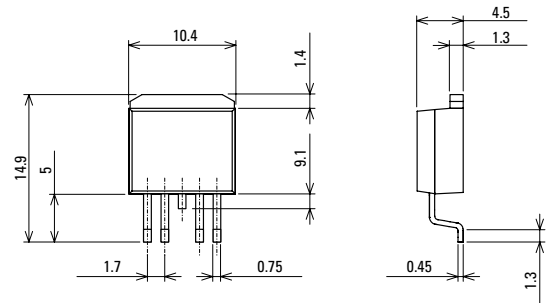
## I-Pak



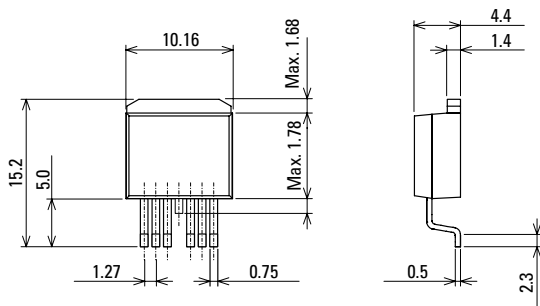
## D<sup>2</sup>Pak



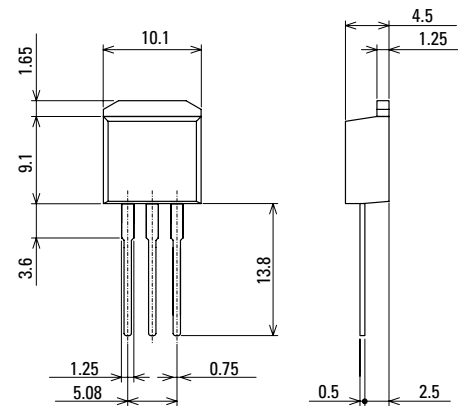
## D<sup>2</sup>Pak 5 Lead



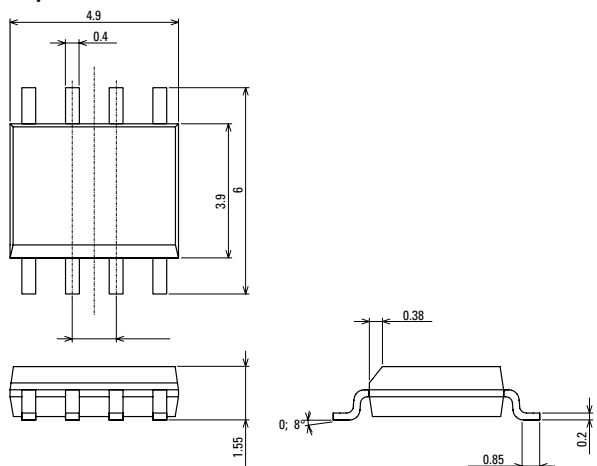
## D<sup>2</sup>Pak 7 Lead



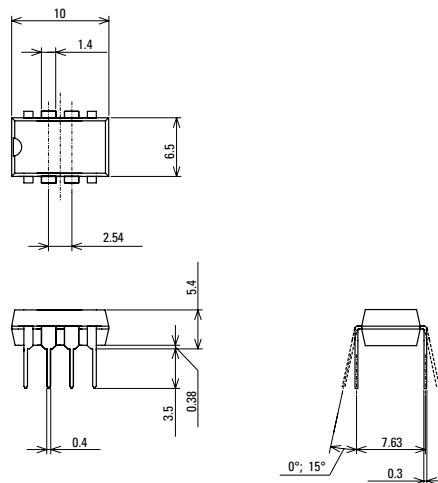
## TO-262



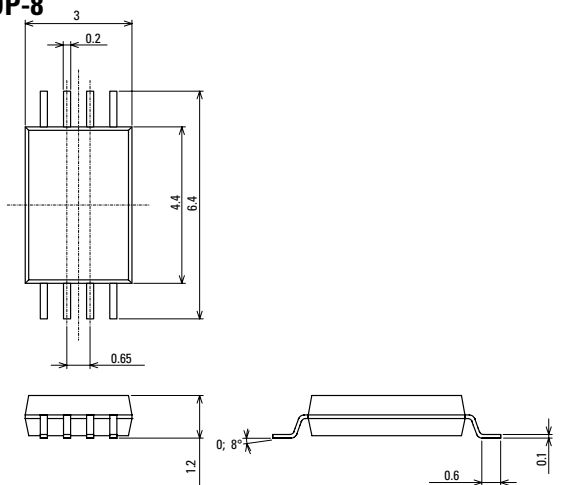
## SO-8 / 8 Lead SOIC



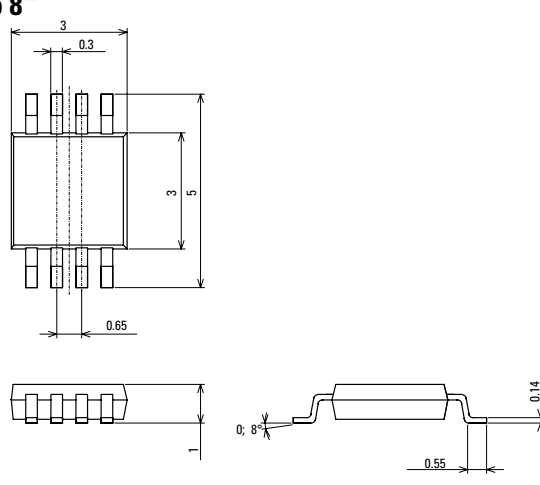
## 8 Lead PDIP



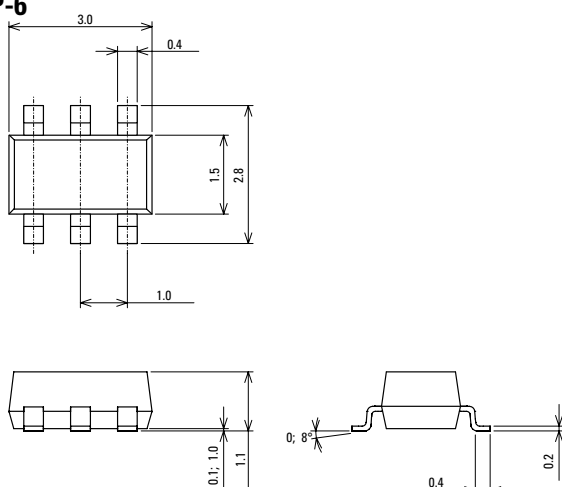
## TSSOP-8



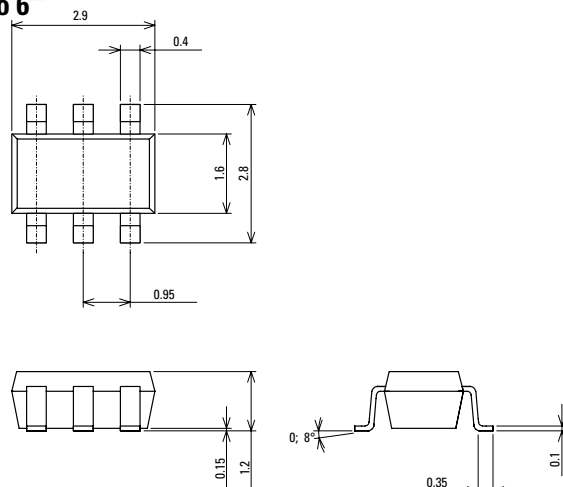
## Micro 8™



## TSOP-6

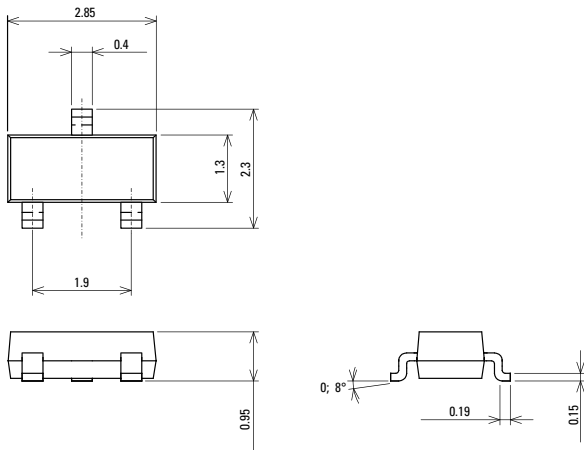


## Micro 6™

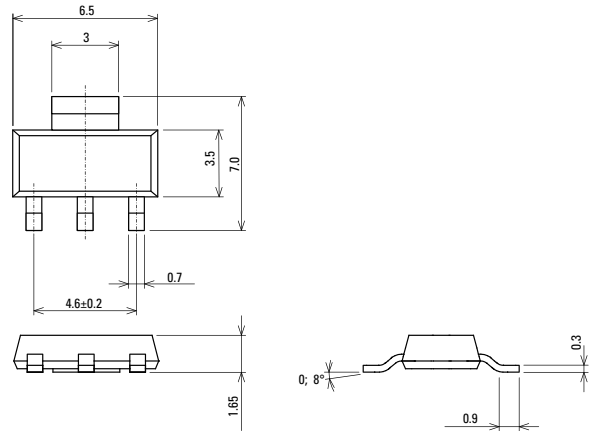


# PACKAGES

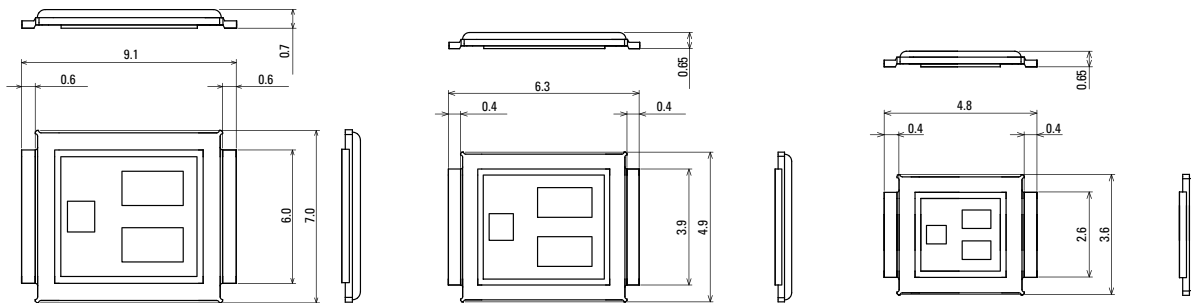
## Micro 3™



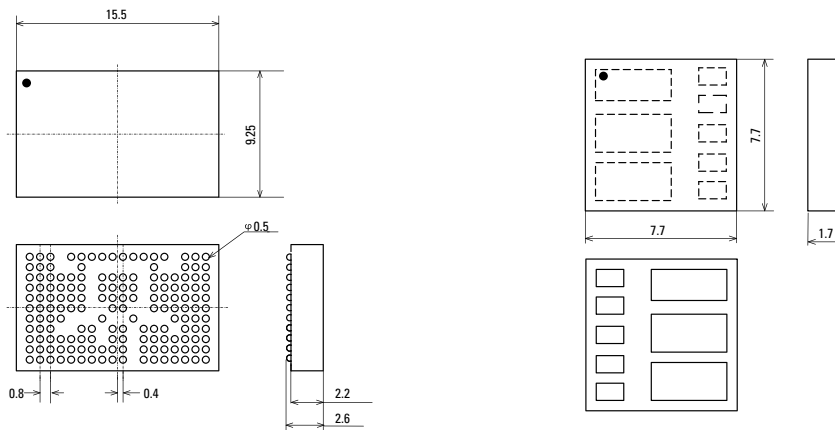
## SOT-223



## DirectFET®



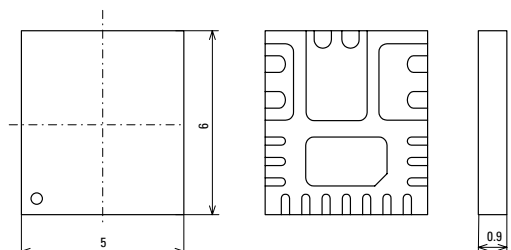
## BGA & LGA (iPOWIR™)





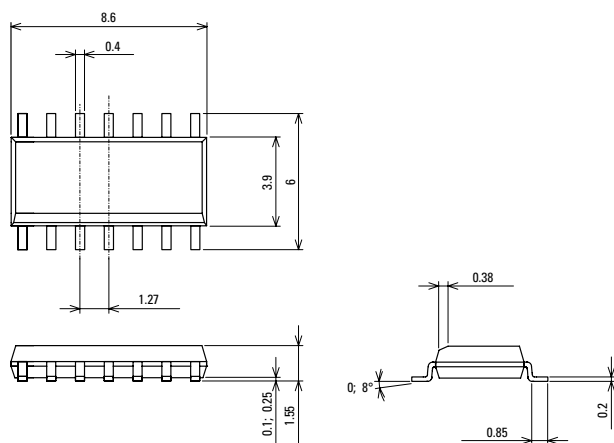
## PQFN 5x6mm

(Sup/RBuck™)\*

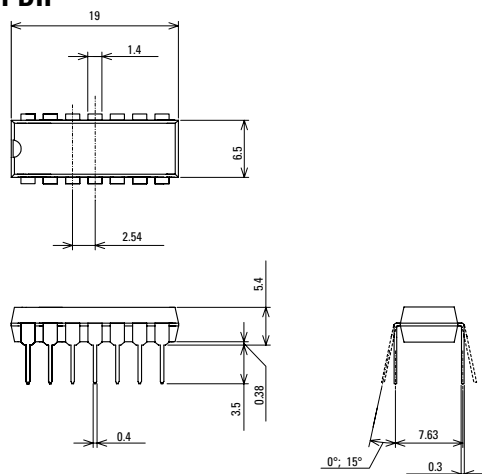


\*MOSFETs available with different footprint

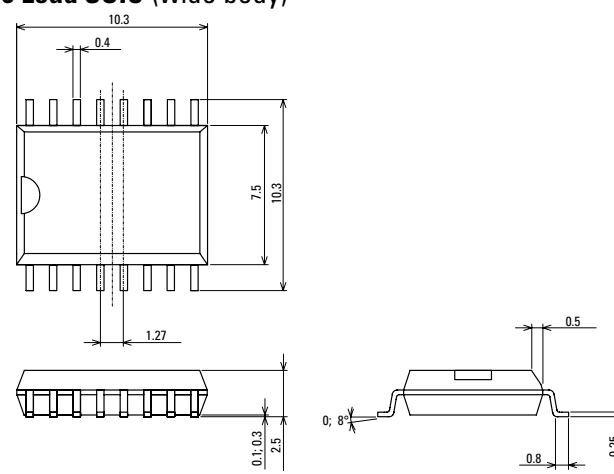
## 14 Lead SOIC (narrow body)



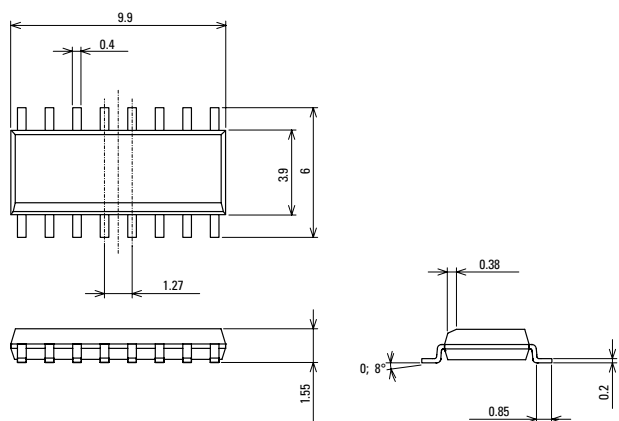
## 14 Lead PDIP



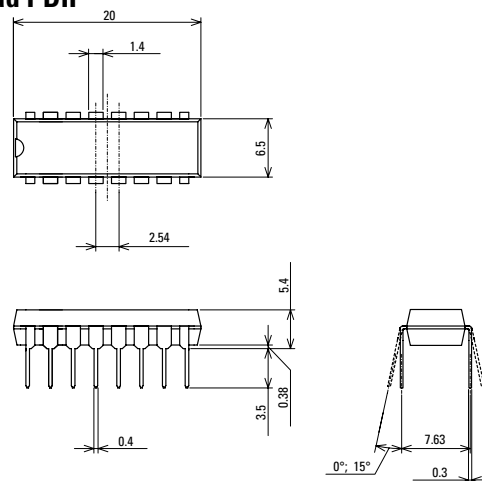
## 16 Lead SOIC (wide body)



## 16 Lead SOIC (narrow body)

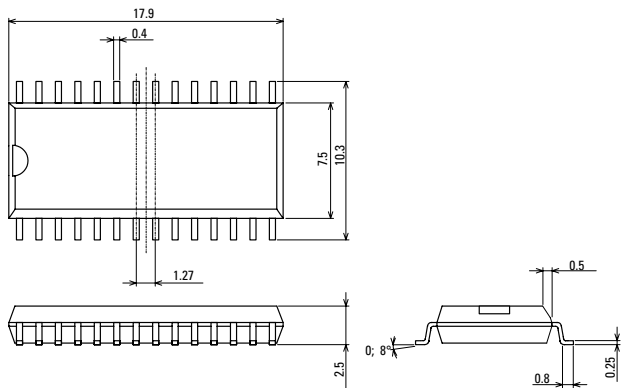


## 16 Lead PDIP

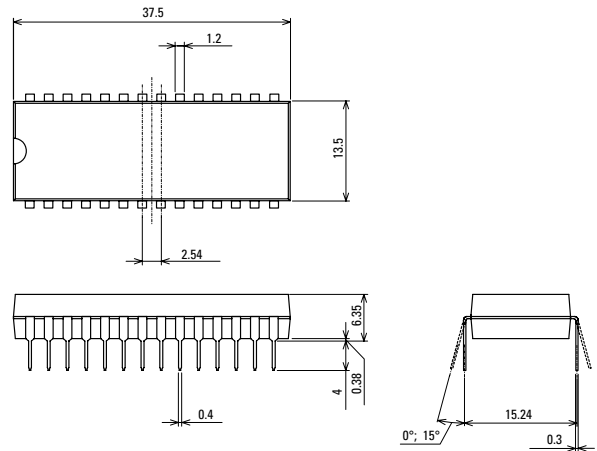


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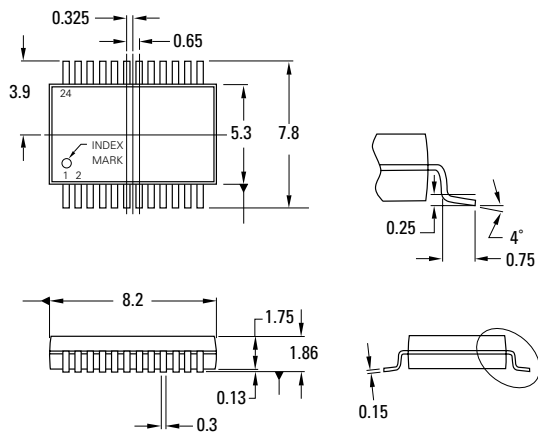
## 28 Lead SOIC



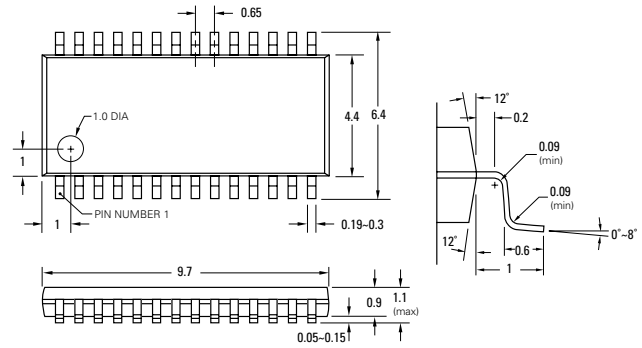
## 28 Lead PDIP



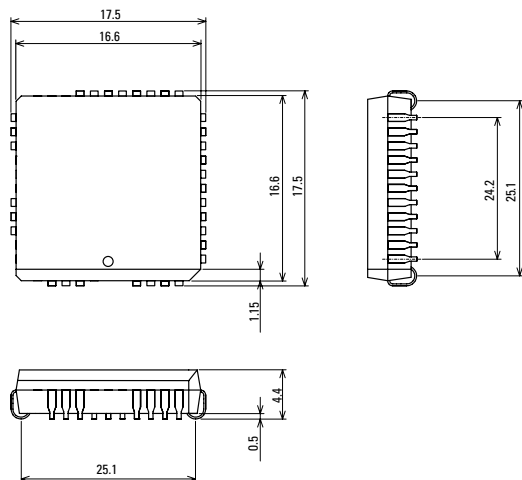
## SSOP 24



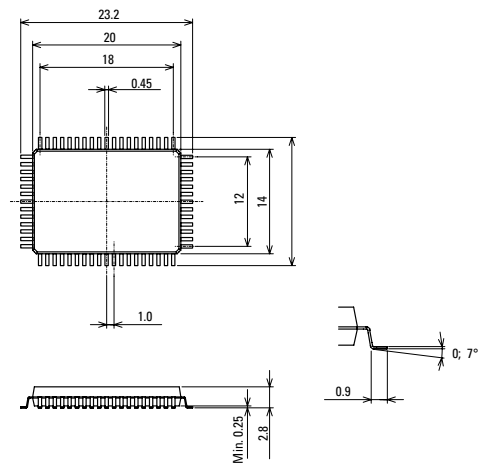
## TSSOP 28



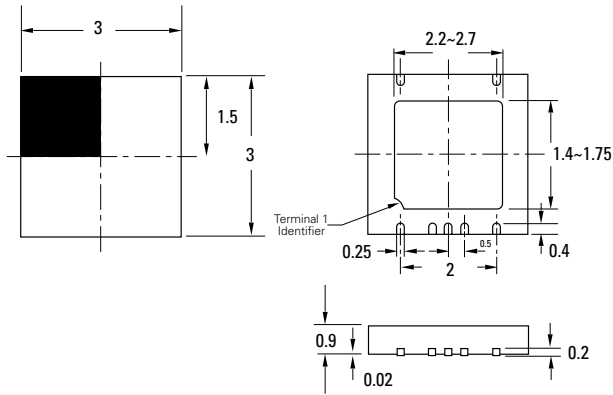
## 44 Lead PLCC



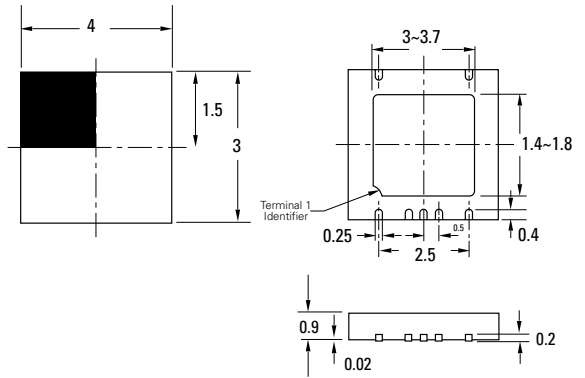
## 64 Lead MQFP



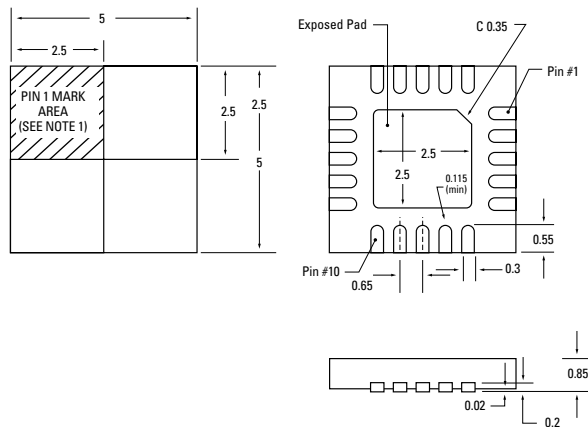
## 10 Lead MLPD



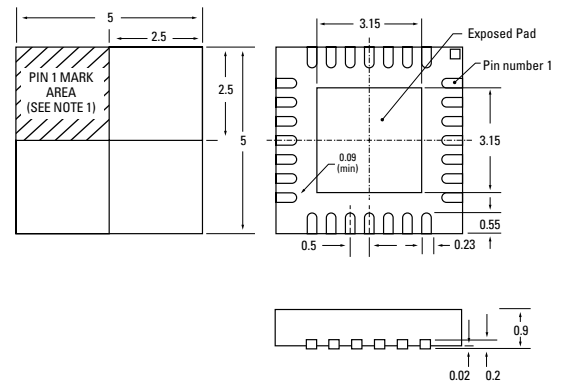
## 12 Lead MLPD



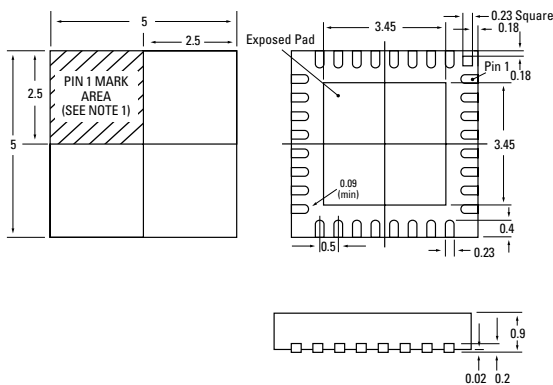
## 20 Lead MLPQ



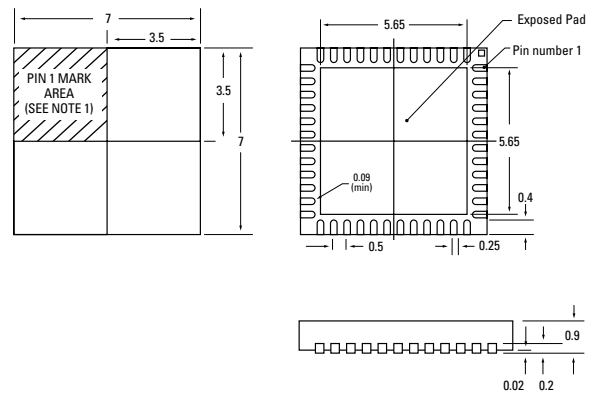
## 28 Lead MLPQ



## 32 Lead MLPQ



## 48 Lead MLPQ





# RESOURCES





**THE *my*POWER ADVANTAGE**

- Eliminates simulation model development by giving access to a fully developed, highly accurate and FREE model
- Eliminates the delay in building breadboards and most breadboarding iterations
- Enables more robust designs optimized for cost and performance
- Saves 1 to 6 months in development time and thousands of dollars in development cost

- **SIMULATE CIRCUITS**
- **COMPARE MOSFETS**
- **ANALYZE WAVEFORMS**
- **CALCULATE LOSSES**

Designing DC-DC converters for advanced NPU or CPU is becoming increasingly complex. Now you have an alternative to starting your new design from scratch.

Try the *my*POWER on-line design center: it is one place dedicated to the design of high performance DC-DC converters operating at up to 80A at  $V_{OUT}$  as low as 1.1V and at frequencies as high as 1 MHz.

*my*POWER gives you a proven design with a complete, costed BOM and a high speed, +/-5% accuracy simulation tool to verify and optimize your circuit. And you can order a customized reference design kit for overnight delivery.



**POL SUPRIBUCK DESIGN TOOL**



Fully featured, easy to use On-line design tool for high efficiency POL applications. Tool features include Schematic Capture, AC, Steady State, Transient Analysis, Thermal Analysis, BOM creation, and more...

**IGBT SELECTION TOOL**



Compare IGBT choices  
See Lowest Losses  
Select Optimal IGBT

**SYNCHRONOUS RECTIFICATION**



Compare IGBT choices  
See Lowest Losses  
Select Optimal IGBT

**BUS CONVERTER**



Multiple Topologies  
Compare discrete MOSFETs  
Calculate efficiency and Tj

**LIGHTING**



Create Schematic and BOM  
Display output waveforms  
AC or DC input Designs

**MOTOR CONTROL**



Analyze performance  
Compare IGBT modules  
Calculate efficiency and Tj

**MOTOR CONTROL**



Create Control Algorithms  
Get Software Updates  
Peek into Future releases

**POWER FACTOR CORRECTION**



Simple circuit design  
Calculate all part values  
Reduce PCB space 50%

**SYNC BUCK MOSFET SELECTOR**



Compare discrete MOSFETs  
Calculate efficiency and Tj

## RESOURCES | REFERENCE DESIGNS

### REFERENCE DESIGNS

International Rectifier recognizes the importance of evaluating the performance of products in an actual operating circuit. Our Reference Design Boards are fully functional, 100% tested designs. Through the use of these reference design boards, weeks can be taken off of your design cycle time.

For more information visit <http://www.irf.com/technical-info/refdesigns/>

Application	Description
DC-DC	Kits made to support DC-DC sync buck converters, DC Bus converters and synchronous PWM controllers
Lighting	Ballast control kits that drive a number of popular fluorescent and halogen lamp types
AC-DC	Reference designs for AC-DC power conversion applications
Motor Control	High voltage gate drive kits for AC Induction or Brushless Motor applications
Appliance Power Module	Appliance motor drive reference design for 0.5 HP AC induction motors
Audio	Audio reference design for High Power Class D Audio Power Amplifier



DC-DC



Lighting



AC-DC



Motor Control



Appliance Power Module



Audio





### GLOBAL ENVIRONMENTAL, HEALTH, AND SAFETY POLICY

International Rectifier is committed to protecting and preserving the environment in all its business operations and providing a safe and secure workplace. It is our intent to respect the views of our customers, employees, community, and stakeholders as a responsible business dedicated to continual improvement in environmental, health and safety management and the prevention of pollution.

### GLOBAL ENVIRONMENTAL, HEALTH, AND SAFETY POLICY CONSISTENT WITH OUR VALUES, PRINCIPLES, AND POLICIES, WE PLEDGE TO:

- Encourage the efficient use of electricity by improving the power conversion process through the development of innovative products.
- Comply with all applicable laws and regulations, and consider any other requirements to which we subscribe.
- Ensure policy performance by stating objectives and setting clear targets for their achievement as part of the Annual Business Planning process.
- Review our EH&S management system to assure its continued applicability and effectiveness through periodic assessments and audits.
- Help conserve natural resources through additional cost-effective reuse, recycling, and reduction efforts in existing and future operations.
- Foster a safe and secure work environment by increasing employee knowledge and awareness of environmental, health and safety best practices.
- Communicate the Policy to all employees, stakeholders, and make it available to the public.

### STEWARDSHIP

Creating Environmental Value - International Rectifier is dedicated to providing an environmentally sustainable future by creating environmental value through our product designs and reducing our local and global environmental footprint through a management culture that integrates environmental goals into the decision making model

- IR designs and manufactures power management products that save energy, providing leadership to an environmentally sustainable future.
- Reducing our footprint on the local and global environment by having environmental goals as part of our annual business planning process.
- ISO14001 Certifications



### OUR MISSION AS A GLOBAL TECHNICAL ASSISTANCE CENTER

Our mission as a global Technical Assistance Center is to provide quality prompt solutions to customer inquiries. In addition to self-support material available on our website qualified application engineers are available to address your questions by email/online or by phone. Our global presence allows for a continuous 24 hours operation, enabling us to resolve most inquiries within the first business day.

In line with the rapid expansion of IR's proprietary product line, regular up to date training is provided for the TAC staff to ensure quality of support. Additional technical documentation such as application notes and design tips are generated to further encourage online self-support and to reduce resolution time.

*iPOWIR*, XPhase, and Sup/IRBuck are trademarks and registered trademark of International Rectifier Corp.

### ONLINE TECH SUPPORT

#### TECHNICAL DOCUMENTS

- Electronics 101 Tutorial
- Application Notes
- Technical Papers
- Design Tips
- Frequently Asked Questions (FAQ's)

#### DESIGN SUPPORT

- Software Design Tools
- Reference Design Kits
- Design Tips

#### PRODUCT INFORMATION

- Parametric Search
- Product Portfolio
- New Products
- Cross Reference & Replacement
- Lead Free
- Product Packaging
- Product Literature

#### PRODUCTS

- High Voltage Gate Drivers
- PFC IC's
- Digital Control IC's
- High Voltage IC's
- *iPOWIR*® Multichip Modules
- Lighting IC's
- Audio IC's
- XPhase® Multiphase Architecture
- Sup/IRBuck™ Integrated DC-DC Regulator
- Intelligent Power Switches
- Micro Electronic Relays
- MOSFETs
- IGBTs

## TAC SUPPORT CHANNELS

- Direct Customers
- IR Sales Reps
- Distributors

## TYPES OF TECHNICAL INQUIRIES SUPPORTED BY TAC

- Assistance with Design-In of IR Technologies
- Recommendation of Proprietary Product Solutions
- Identification/Verification of Part Numbers
- Applications Assistance
- Trouble Shooting Customer Designs
- Product Selection
- Verification of Product Datasheet Parameters
- Cross Reference for Competitor Parts
- Recommendations of Alternatives for Obsolete Parts

## CHANNELS OF CONTACT

Online: <http://tac.irf.com>  
 E-mail: [tac@irf.com](mailto:tac@irf.com)  
 Phone Numbers:

### NORTH AMERICA

Hours: 8:00AM-5:00PM PST  
 Tel: 1-310-252-7105  
 Fax: 1-310-252-7903

### EUROPE

Hours: 9:00AM-5:00PM GMT  
 Tel: ++ 49-(0)6102-884-311  
 Fax: ++ 49-(0)6102-884-433

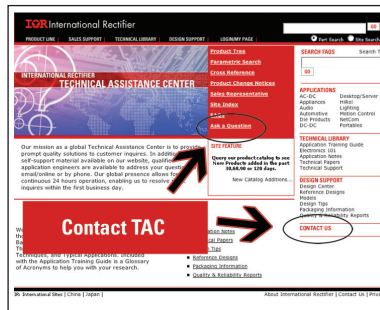
### ASIA

Hours: 9:00AM-6:00PM CST  
 Tel: ++ 86-(0)21-5877-5606  
 Fax: ++ 86-(0)21-5877-3880

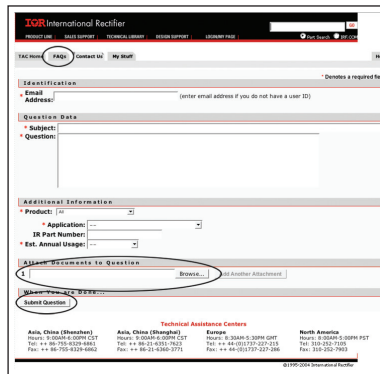
How to find Technical Support on the International Rectifier main webpage:



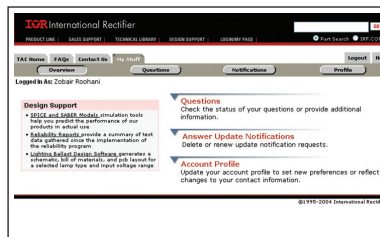
How to submit a question online:



Using the following interface questions along with related attachments (e.g. schematics) can be submitted. Upon successful submission of a question the system will issue an incident tracking number.



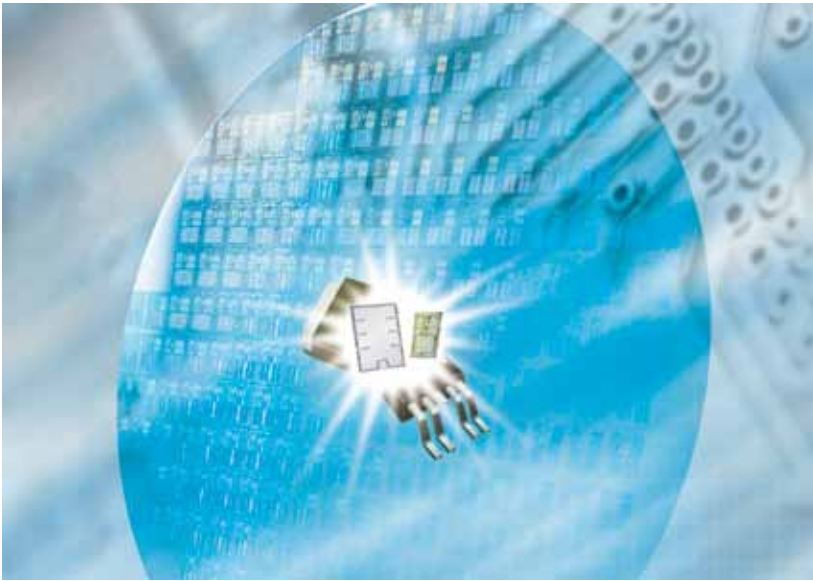
"My Stuff" Tab allows to update or to check the status of an incident. This tab also enables the use to answer update notifications, and edit account profile.



Using the FAQ tab you may view our extended online knowledge base:



## RESOURCES | THE SureCHIP™ PROCESS



International Rectifier's SureCHIP Program is a process regimen that combines high-volume manufacturing and assembly with precision parametric testing and special packaging to deliver Known Good Die (KGD) power semiconductors. The KGD process provides measurably higher yields and is an economically viable solution in the manufacturing of multi-chip modules (MCMs). As part of the SureCHIP process, individual good die from probed and sawn wafers are transferred to a custom-designed test nest for 100% electrical and visual testing.

SureCHIP power semiconductor die are packaged into tape and reel in a nitrogen atmosphere or into chip trays for shipment. The SureCHIP KGD process is qualified for 100% DC parametric testing. Additionally, avalanche testing on MOSFETs and short circuit testing on IGBTs can be performed.

### THE IR ADVANTAGE

- KGD testing equal to package part testing
- 100% Avalanche capability for more than 75A
- Singulated testing, eliminating lateral current paths
- Accurate testing for  $R_{DS(on)}$
- Voltage ratings up to 1200V
- Leakage current testing down to nA range
- Pogo pins provide accurate voltage and resistance readings
- Hybrid modifications enable clean noise environment
- Each die is warranted to be electrically good

### KGD PACKAGE OPTIONS



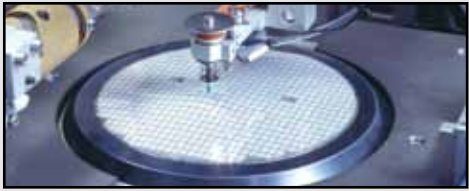
#### T&R option:

T&R dimensions are according to die size.



#### Chip pack option:

Tray packaging option can be either 4" x 4" or 2" x 2" (outside dimensions).



Individual Die from probed and sawn wafer are transferred to a custom designed test nest for electrical testing

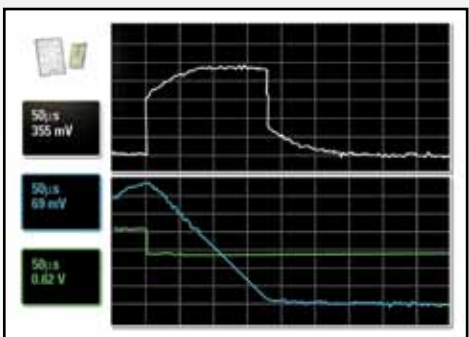


SureCHIP is packaged in tape after passing 100% electrical testing and visual inspection



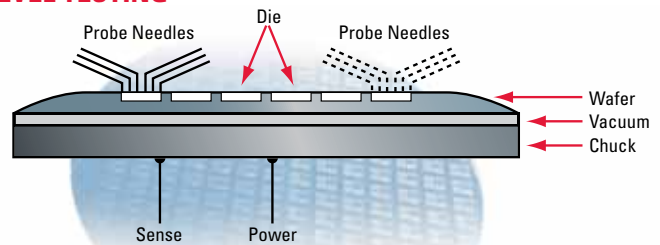
Die is fully tested in the proprietary test nest with the true Kelvin connections to enable measurements at high current

## SAMPLE AVALANCHE TEST RESULTS



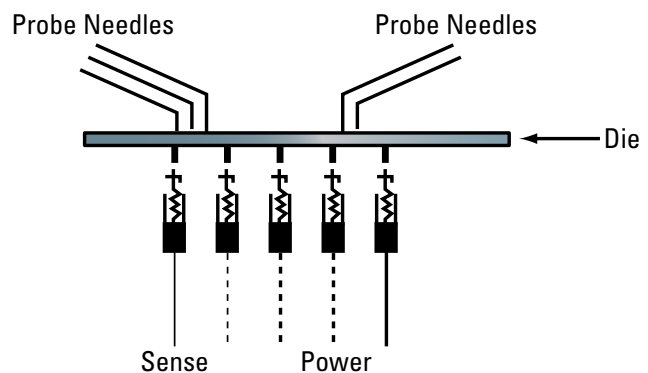
## Comparison of Wafer Level Testing of $R_{DS(on)}$ vs. IR's KGD Solution

### WAFER LEVEL TESTING



1. Multiple contacts between backside of wafer and chuck tester
2. Die to Die interference cannot be isolated
3.  $R_{DS(on)}$  accurate down to  $20m\Omega$
4.  $I_{DRAIN}$  measurements constrained to less than 10A
5. Parallel testing resulting in multiple signal paths that can effect results
6. Key measurements impacted by Kelvin contacts over entire backside of wafer
7. High risk for final application due to dicing operation

### IR'S KGD LEVEL TESTING



1. Pogo pins provide uniform contact
2. Direct contact with isolated Die
3.  $R_{DS(on)}$  accurate down to  $2.5m\Omega$
4.  $I_{DRAIN}$  Measurements possible to greater than 75A
5. Singulated testing, eliminating lateral current paths
6. Hybrid modifications enable cleaner noise environment
7. Kelvin contact fixed to single location for single die
8. Singulated die usually pre-screened for mechanical defects



# GLOBAL LOCATIONS

**Innovation For Energy Conservation** — For over 60 years, IR's industry-leading power management technology has helped transform crude electricity into clean, efficient power. Today, IR strives to conserve the world's dwindling energy reserves by:

- Enabling affordable energy-saving solutions that squeeze more efficiency from everyday electronic products and;
- Tackling tough technology roadblocks by delivering high power density that extends performance of next-generation communications and computing equipment with less wasted energy.



## Design Centers\*

- 1 El Segundo, CA
- 5 San Jose, CA
- 6 Irvine, CA
- 7 Leominster, MA
- 8 Warwick, RI
- 9 Durham, NC
- 11 Newport, UK
- 13 Skovlunde, Denmark
- 14 Provence, France
- 15 Pavia, Italy

## Technical Assistance Centers and Service Centers\*

- 1 El Segundo, CA
- 12 Reigate, UK
- 16 Neu Isenburg, Germany
- 17 Singapore
- 18 Shenzhen, China
- 19 Shanghai, China
- 20 Tokyo, Japan
- 21 Seoul, Korea

## Manufacturing\*

- 1 El Segundo, CA
- 2 Temecula, CA
- 3 Mesa, AZ
- 4 Tijuana, Mexico
- 5 San Jose, CA
- 7 Leominster, MA
- 10 Newport, Wales, UK
- 22 St. Paul, MN

\* Only major centers are listed.

## Facts

- Established in 1947
- Over 3,900 employees world wide
- New York Stock Exchange: IRF
- Operations in 20+ countries
- Holder of over 600 technology patents
- Industry leader in R&D investment

## Products

- High performance analog, digital and mixed signal ICs
- Advanced circuit devices
- Power systems
- Benchmark MOSFETs

DISCLAIMER: International Rectifier Corporation and its affiliates (IR) reserve the right to make changes to their products and the information contained herein without notice. Customers should verify that product specification is current before placing orders. All products are sold subject to IR's standard terms and conditions or other terms and conditions of sale supplied at the time of order acknowledgement. Application information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by IR for the use or misuse of such information or for any infringements of patents or other rights of the third parties which may result from its use. No license is granted by implication or otherwise under any patent or patents rights or IR or others.

Product Line	Applications	Key Products
 <p><b>Energy Saving Products</b> Integrated design platforms that enable customers to add energy-conserving features that achieve lower operating energy costs and manufacturing Bill of Material (BOM) costs.</p>	<ul style="list-style-type: none"> <li>• Appliances</li> <li>• Audio</li> <li>• Display</li> <li>• Industrial</li> <li>• Lighting</li> <li>• SMPS</li> </ul>	<ul style="list-style-type: none"> <li>• Digital Control ICs</li> <li>• High-Voltage ICs</li> <li>• IGBTs</li> <li>• IRAM Integrated Power Modules</li> <li>• Intelligent Power Switches</li> <li>• MERs</li> </ul>
 <p><b>Enterprise Power</b> Optimized power management system solutions that deliver benchmark power density, efficiency and performance in enterprise power.</p>	<ul style="list-style-type: none"> <li>• Servers</li> <li>• Storage Networks</li> <li>• Switchers &amp; Routers</li> <li>• Workstations</li> <li>• Notebooks</li> <li>• Game Stations</li> <li>• Set-Top Box</li> </ul>	<ul style="list-style-type: none"> <li>• DirectFET®</li> <li>• Low-Voltage ICs</li> <li>• Sup/REBuck™</li> <li>• XPhase®</li> <li>• Power Monitor IC</li> <li>• IPOWIR®</li> </ul>
 <p><b>Automotive</b> Automotive grade power management solutions qualified to meet the needs of 12V, 24V and HEV/EV applications with a zero defect goal.</p>	<ul style="list-style-type: none"> <li>• AC and DC Motor Drives</li> <li>• Powertrain / Engine control</li> <li>• Body Electronics</li> <li>• Lighting</li> <li>• Class D Audio</li> <li>• Heavy Loads and Actuators</li> </ul>	<p>Automotive Qualified:</p> <ul style="list-style-type: none"> <li>• HEXFET® Power MOSFETs</li> <li>• Intelligent Power Switches</li> <li>• Driver ICs (Low-, Mid- and High-Voltage)</li> <li>• IGBTs for Motor Drives, Various Loads</li> <li>• DirectFET®<b>2</b></li> </ul>
 <p><b>Benchmark MOSFETs</b> IR continues to lead the industry by offering power MOSFETs with the lowest <math>R_{DS(on)}</math> and widest range of packages up to 250V for a diverse range of applications.</p>	<ul style="list-style-type: none"> <li>• Audio</li> <li>• Computing</li> <li>• Communications</li> <li>• Motor Control</li> <li>• Power Supply</li> <li>• Synchronous Rectification</li> </ul>	<ul style="list-style-type: none"> <li>• Discrete HEXFET® MOSFETs</li> <li>• Dual HEXFET® MOSFETs</li> <li>• FETKY®</li> </ul>
 <p><b>HiRel</b> Our discrete components, complex hybrid power module assemblies and rugged DC-DC converters utilize leading-edge power technology which, together with demanding environmental specifications help engineers to meet their toughest design challenges.</p>	<ul style="list-style-type: none"> <li>• Space</li> <li>• Military</li> <li>• Commercial Aviation</li> <li>• Rugged Industrial</li> <li>• Medical</li> </ul>	<ul style="list-style-type: none"> <li>• RAD-Hard MOSFETs</li> <li>• Power Modules/Hybrid Solutions</li> <li>• Motor Control Solutions</li> <li>• DC-DC Converters</li> </ul>