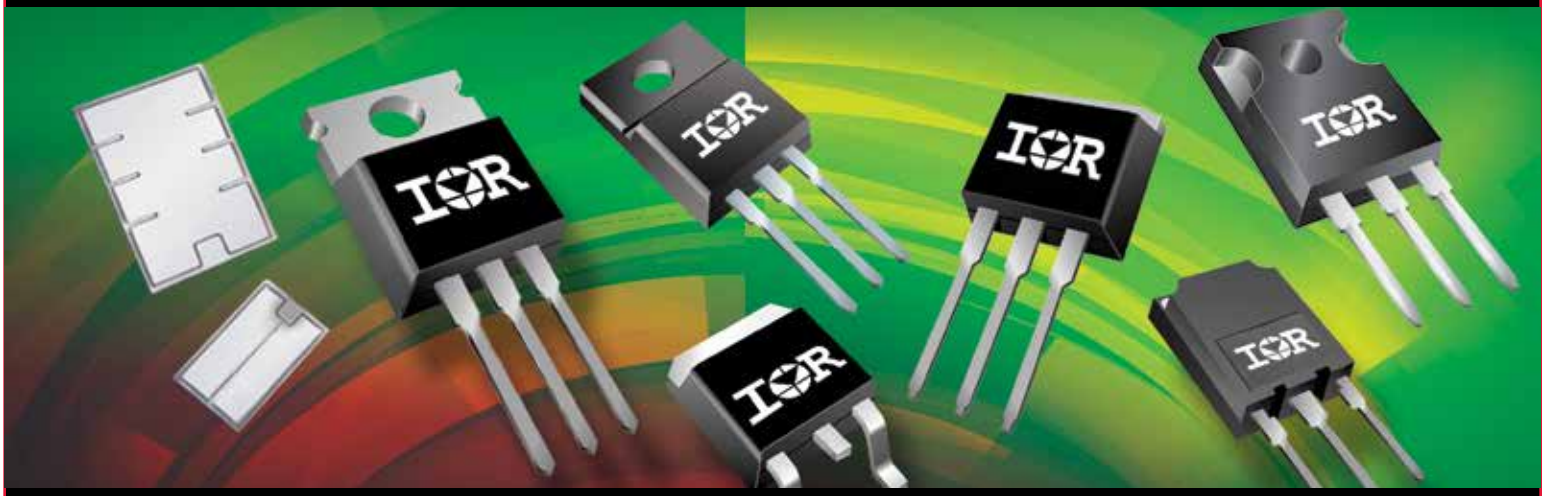
IGBT
Product Selection Guide



International
IOR Rectifier
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IGBT Online Selection Tool - mypower.irf.com/IGBT

Conditions

- Bus Voltage
- Package Requirements
- Current
- Frequency
- Short Circuit

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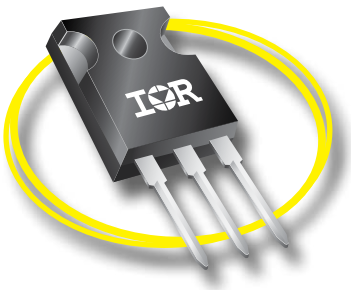
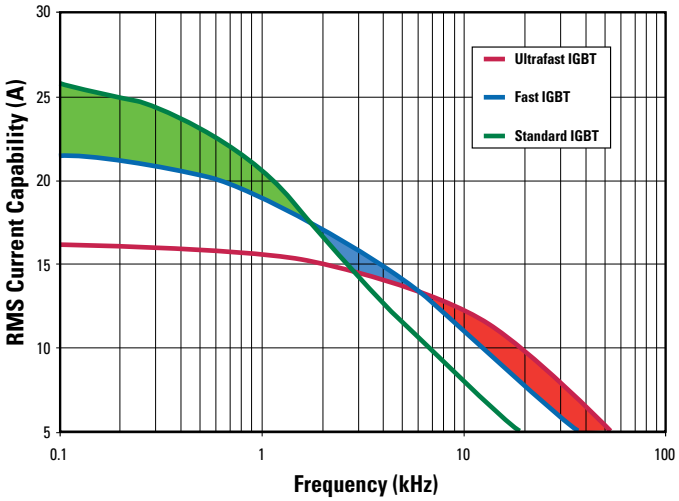
Online IGBT Selection Tool

- Use application conditions
- Calculate conduction losses
- Calculate switching losses
- Provide MSRP to show cost implications of design choices

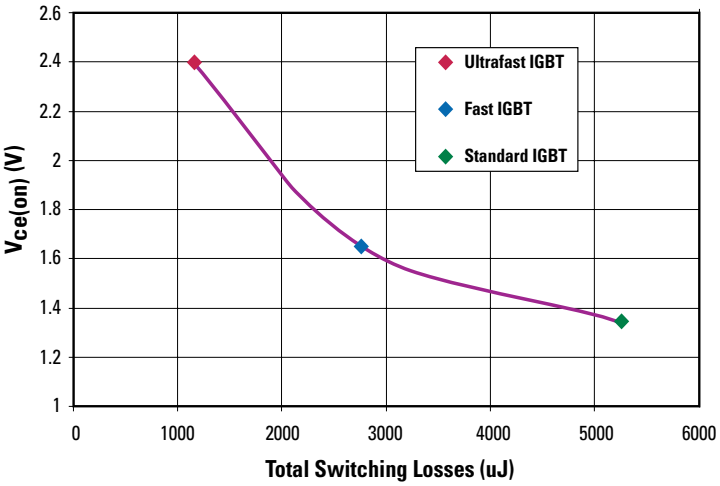
Optimized IGBT



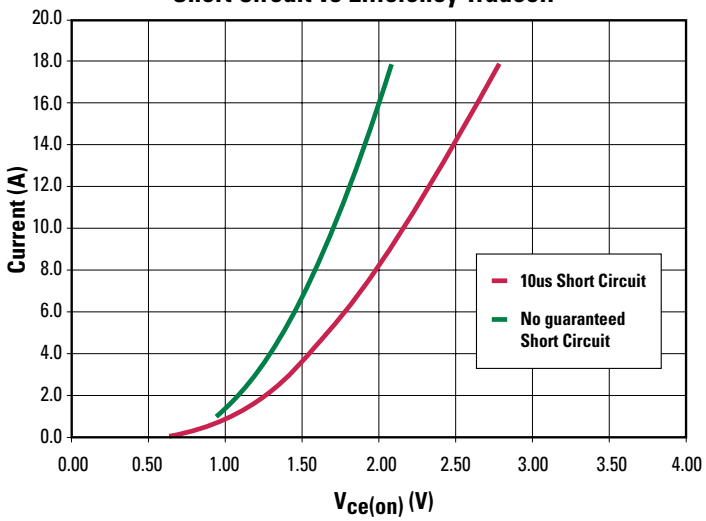
Speed Tradeoffs



Conduction Losses vs Switching Losses Tradeoff



Short Circuit vs Efficiency Tradeoff

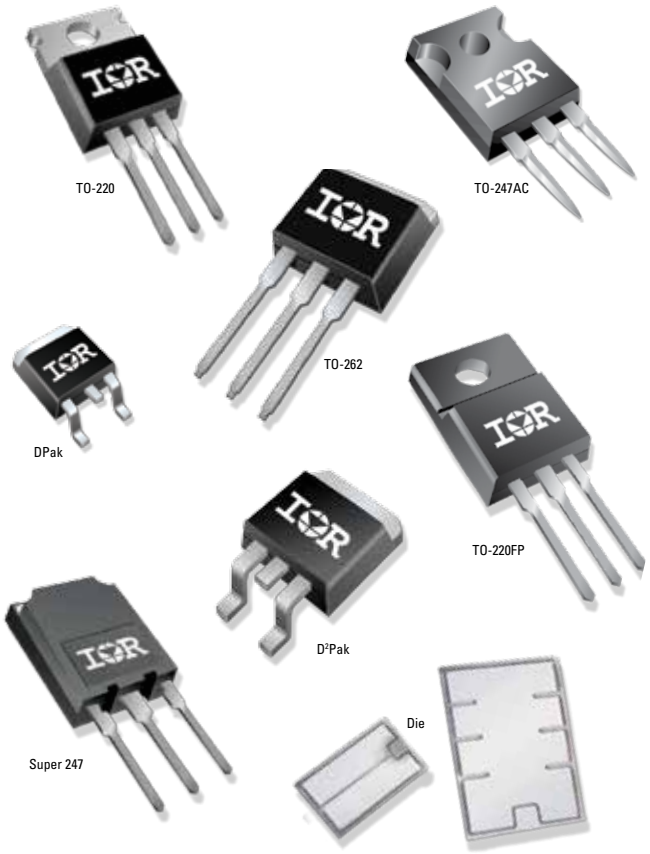


Extensive Portfolio of IGBTs

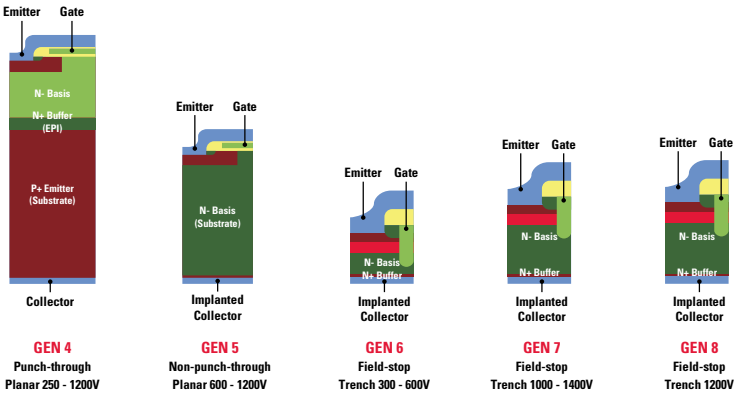
IR offers a wide portfolio of IGBTs allowing customers to meet design and performance goals. Various technologies such as NPT (Non-Punch Through) and Trench allow lowest switching and conduction losses to increase efficiency, reduce thermal problems and improve power density.

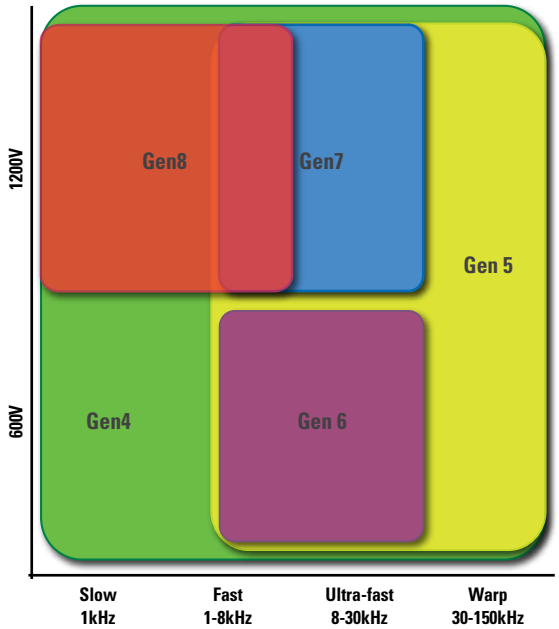
- **PFC, Welding -** Designed with low switching losses for operation at high frequencies up to 100kHz.
- **UPS, Solar Inverter -** Designed for switching frequencies between 15-25 kHz. They are typically used in UPS and Solar Inverters.
- **Plasma Display -** Designed for Plasma Display applications. They offer high saturation currents and fast switching.
- **Welding, HID -** Designed for lowest conduction losses, they are best suited for switching frequencies below 1kHz in applications .
- **Motor Drive -** Recommended for motor drive inverters. They are all co-packaged with freewheeling diode.
- **Die** - Most IGBTs are available on Die. Please contact our Die Sales Team if you require any further information.

Online IGBT Selection Tool – mypower.irf.com/igbt



IR's IGBT Generations





IR offers an extensive IGBT portfolio ranging from 300V to 1200V based on various technologies that minimize switching and conduction losses to increase efficiency, reduce thermal problems and improve power density. Each IGBT technology has been tailored towards specific applications which allows the designer to select the most suitable characteristics for their design.

Single Rugged IGBTs (with Tsc)

Voltage	Speed	I_c @ 100°C	$V_{CE(ON)}$ (typ)	Tsc (µs)	TO-262	D²PAK	TO-220	TO-247	TO-247 (Long Lead)	Super TO-247
430	DC-1 kHz	14	1.55	10	IRGS14C40L	IRGB14C40L				
600	8-30 kHz	7	2.10	10		IRGS4B60K	IRGB4B60K			
		7	1.80	10		IRGS6B60K	IRGB6B60K			
		15	1.80	10		IRGS15B60K				
		16	2.21	10			IRG4BC30K	IRG4PC30K		
		19	1.80	10		IRGS8B60K	IRGB8B60K			
		24	1.60	5					IRGP4062-E	
		25	2.10	10			IRG4BC40K	IRG4PC40K		
		30	1.84	10				IRG4PC50K		
		40	1.60	5				IRGP4640	IRGP4640-E	
		48	1.65	5				IRGP4063		
		50	1.60	5				IRGP4069	IRGP4069-E	
		50	1.95	10	IRGSL30B60K	IRGS30B60K	IRGB30B60K			
		60	1.83	10						IRG4PSC71KPBF
		90	1.70	5				IRGP4066	IRGP4066-E	
650		60	1.65	5				IRGP4760	IRGP4760-E	
		90	1.70	5				IRGP4790	IRGP4790-E	
1,200		5	3.17	10	IRG4BH20K-L	IRG4BH20K-S		IRG4PH20K		
		10	3.10	10				IRG4PH30K		
		15	2.74	10				IRG4PH40K		
		23	2.05	10				IRG7PH30K10		
		24	2.43	10				IRG4PH50K		
		42	2.97	10						IRG4PSH71K
		130	2.00	10						IRG7PSH73K10

Co-Pack Rugged IGBTs (with Tsc)

Voltage	Speed	I_c @ 100°C	$V_{CE(ON)}$ (typ)	Tsc (us)	V_F (typ)	TO-262	D-PAK	D²PAK	TO-220	TO-220 FullPak	TO-247	TO-247 (Long Lead)	Super TO-247
300	8-30 kHz	40	1.46	5	2.26						IRGP4072D		
600	1-8 kHz	5	1.60	3	1.30								
		8	1.66	10	1.40					IRG4IBC20FD			
		9	1.88	10	1.50				IRG4BC15MD				
		11	1.85	10	1.40				IRG4BC20MD				
	8-30 kHz	2	1.83	10	1.50		IRGR2B60KD						
		4	1.75	5	1.60				IRGB4059D				
		5	2.39	10	1.50		IRG4RC10KD		IRG4BC10KD				
		6	1.70	5	1.60		IRGR4045D	IRGS4045D	IRGB4045D				
		6	2.27	10	1.40					IRG4IBC20KD			
		7	1.75	5	TBD		IRGR4607D	IRGS4607D	IRGB4607D				
		8	1.55	5	1.80				IRGB4060D				
		8	1.80	10	1.25					IRGIB7B60KD			
		9	2.10	10	1.40	IRGSL4B60KD1		IRGS4B60KD1	IRGB4B60KD1				
		9	2.27	10	1.40			IRG4BC20KD-S	IRG4BC20KD				
		9	2.21	10	1.40					IRG4IBC30KD			
		10	1.60	5	2.50			IRGS4064D	IRGB4064D				
		10	1.70	10	1.80					IRGIB10B60KD1			
		10	1.70	5	1.60		IRGR4610D	IRGS4610D	IRGB4610D				
		10	1.80	10	1.25	IRGSL6B60KD		IRGS6B60KD	IRGB6B60KD	IRGIB6B60KD			
		12	1.55	5	2.10			IRGS4056D	IRGB4056D				
		12	1.80	10	1.69					IRGIB15B60KD1			
		15	1.55	5	1.80			IRGS4615 D	IRGB4615D				
		15	1.80	10	1.20	IRGSL15B60KD		IRGS15B60KD	IRGB15B60KD				
		16	2.21	10	1.40			IRG4BC30KD-S	IRG4BC30KD		IRG4PC30KD		
		18	1.65	5	2.30				IRGB4061D				
		19	1.80	10	1.30	IRGSL10B60KD		IRGS10B60KD	IRGB10B60KD				
		20	1.55	5	2.10			IRGS4620D	IRGB4620D		IRGP4620D	IRGP4620D-E	
		24	1.60	5	1.80	IRGSL4062D		IRGS4062D	IRGB4062D		IRGP4062D	IRGP4062D-E	
		25	2.10	10	1.30						IRG4PC40KD		
		30	1.65	5	2.10			IRGS4630D	IRGB4630D		IRGP4630D	IRGP4630D-E	
		30	1.84	10	1.30						IRG4PC50KD	IRG4PC50KD-E	
		30	1.95	10	1.30							IRGP30B60KD-E	
		30	1.65	5	TBD						IRGP6630D	IRGP6630D-E	
		40	1.60	5	1.80			IRGS4640D	IRGB4640D		IRGP4640D	IRGP4640D-E	
		40	1.60	5	TBD						IRGP6640D	IRGP6640D-E	
		48	1.65	5	-						IRGP4063	IRGP4063-E	
		48	1.65	5	1.95						IRGP4063D	IRGP4063D-E	
		48	1.65	5	0.96						IRGP4068D	IRGP4068D-E	
		48	1.65	5	2.00						IRGP4063D1	IRGP4063D1-E	
		50	1.60	5	2.20						IRGP4078D	IRGP4078D-E	
		50	1.60	5	2.20						IRGP4069D	IRGP4069D-E	
		50	1.60	5	2.20						IRGP4650D	IRGP4650D-E	
		50	1.60	5	TBD						IRGP6650D	IRGP6650D-E	
		60	1.65	5	1.95						IRGP4660D	IRGP4660D-E	
		60	1.83	10	1.40								IRG4PSC71KD
		60	1.65	5	TBD						IRGP6660D	IRGP6660D-E	
		90	1.70	5	1.95						IRGP4690D	IRGP4690D-E	
		90	1.70	5	2.23						IRGP4066D	IRGP4066D-E	
		90	1.70	5	TBD						IRGP6690D	IRGP6690D-E	
		160	1.70	5	1.95								IRGPS46160D
		160	1.70	5	2.40								IRGPS4067D
		160	1.70	5	TBD								IRGPS66160D
650		15	1.55	5	1.80			IRGS4715D	IRGB4715D				
		40	1.60	5	1.80						IRGP4740D	IRGP4740D-E	
		50	1.70	5	2.23						IRGP4750D	IRGP4750D-E	
		60	1.65	5	1.95						IRGP4760D	IRGP4760D-E	
		90	1.70	5	2.23						IRGP4790D	IRGP4790D-E	
1,200	1-8 kHz	8	1.70	10	TBD				IRG8B08N120KD		IRG8P08N120KD	IRG8P08N120KD-E	
		15	1.70	10	TBD						IRG8P15N120KD	IRG8P15N120KD-E	
		25	1.70	10	TBD						IRG8P25N120KD	IRG8P25N120KD-E	
		40	1.70	10	TBD						IRG8P40N120KD	IRG8P40N120KD-E	
		50	1.70	10	TBD						IRG8P50N120KD	IRG8P50N120KD-E	
		60	1.70	10	TBD						IRG8P60N120KD	IRG8P60N120KD-E	
	8-30 kHz	5	3.17	10	2.50						IRG4PH20KD		
		6	2.75	10	2.13				IRGB5B120KD				
		10	3.10	10	3.40						IRG4PH30KD		
		15	2.74	10	2.60						IRG4PH40KD		
		16	2.05	10	2.00						IRG7PH30K10D		
		20	3.05	10	1.67							IRGP20B120UD-E	
		24	2.77	10	2.50						IRG4PH50KD		
		25	1.90	10	TBD						IRG7PH37K10D	IRG7PH37K10D-E	
		30	2.46	10	1.86						IRGP30B120KD	IRGP30B120KD-E	
		40	1.90	10	TBD						IRG7PH44K10D	IRG7PH44K10D-E	
		40	3.12	10	2.03								IRGPS40B120UD
		42	2.97	10	2.50								IRG4PSH71KD
		50	1.90	10	TBD						IRG7PH50K10D	IRG7PH50K10D-E	
		60	2.50	10	1.93								IRGPS60B120KD
		75	1.90	10	TBD								IRG7PSH54K10D

Recently Released | Coming Soon

IGBT Product Selection Guide

Co-Pack High Efficiency IGBTs (no Tsc)

Voltage	Speed	I_C @ 100°C	$V_{CE(ON)}$ (typ)	V_I(typ)	TO-262	D-PAK	D²PAK	TO-220	TO-220 FullPak	TO-247	TO-247 (Long Lead)	Super TO-247
330	8-30 kHz	40	1.36	1.19				IRG6B330UD				
600	DC-1 kHz	8	1.58	1.50	IRG4BC10SD-L	IRG4RC10SD	IRG4BC10SD-S	IRG4BC10SD				
		10	1.40	1.40			IRG4BC20SD-S	IRG4BC20SD				
		41	1.28	1.30						IRG4PC50SD		
	1-8 kHz	9	1.66	1.40				IRG4BC20FD				
		17	1.59	1.40			IRG4BC30FD-S	IRG4BC30FD		IRG4PC30FD		
		17	1.59	1.40				IRG4BC30FD1				
		27	1.50	1.30						IRG4PC40FD		
		39	1.45	1.30						IRG4PC50FD	IRG4PC50FD-E	
	8-30 kHz	4	2.15	1.50					IRG4IBC10UD			
		5	2.15	1.50		IRG4RC10UD		IRG4BC10UD				
		6	1.85	1.40					IRG4IBC20UD			
		7	1.85	1.40			IRG4BC20UD-S	IRG4BC20UD				
		8	2.02	1.50	IRG4BC15UD-L		IRG4BC15UD-S	IRG4BC15UD				
		9	1.95	1.40					IRG4IBC30UD			
		12	1.95	1.40				IRG4BC30UD		IRG4PC30UD		
		20	1.72	1.30						IRG4PC40UD	IRG4PC40UD-E	
		27	1.65	1.30						IRG4PC50UD	IRG4PC50UD-E	
		60	1.67	1.40								IRG4PSC71UD
	30-150 kHz	22	2.50	1.50				IRGB20B60PD1				
		22	2.50	1.40						IRGP20B60PD	IRGP20B60PD-E	
		34	2.25	1.30						IRGP35B60PD	IRGP35B60PD-E	
		42	2.00	1.50						IRGP50B60PD	IRGP50B60PD-E	
		45	2.00	1.30						IRGP50B60PD1	IRGP50B60PD1-E	
900		28	2.25	2.50						IRG4PF50WD		
1,000	8-30 kHz	40	1.70	2.00						IRG7PG42UD	IRG7PG42UD-E	
1,200		18	1.90	1.15						IRG7PH28UD1	IRG7PH28UD1M	
		21	2.43	2.60						IRG4PH40UD	IRG4PH40UD-E	
		21	2.43	3.40							IRG4PH40UD2-E	
		24	2.78	2.50						IRG4PH50UD	IRG4PH50UD-E	
		25	1.90	2.80						IRG7PH35UD		
		25	1.90	1.15						IRG7PH35UD1	IRG7PH35UD1-E / IRG7PH35UD1M	
		30	1.69	1.08						IRG7PH42UD2	IRG7PH42UD2-E	
		40	1.70	2.00						IRG7PH42UD	IRG7PH42UD-E	
		45	1.70	1.15						IRG7PH42UD1	IRG7PH42UD1-E / IRG7PH42UD1M	
		50	2.52	2.92								IRG4PSH71UD
		57	1.70	3.10						IRG7PH46UD	IRG7PH46UD-E	
		70	1.70	3.00								IRG7PSH50UD
1,400		20	1.90	TBD						IRG7PK35UD1	IRG7PK35UD1-E	
		36	1.90	TBD						IRG7PK42UD1	IRG7PK42UD1-E	

Single High Efficiency IGBTs (no Tsc)

Voltage	Speed	I_C @ 100°C	$V_{CE(ON)}$ (typ)	TO-262	D-PAK	D²PAK	TO-220	TO-220 FullPak	TO-247	TO-247 (Long Lead)	Super TO-247
300	8-30 kHz	40	1.49						IRGP4086		
600	DC-1 kHz	8	1.58				IRG4BC10S				
		10	1.40				IRG4BC20S				
		13	1.40					IRG4IBC30S			
		18	1.40			IRG4BC30S-S	IRG4BC30S		IRG4PC30S		
		31	1.32				IRG4BC40S		IRG4PC40S		
		41	1.28						IRG4PC50S		
	1-8 kHz	9	1.66		IRG4RC20F		IRG4BC20F				
		17	1.59				IRG4BC30F		IRG4PC30F		
		27	1.50				IRG4BC40F		IRG4PC40F		
		39	1.45						IRG4PC50F	IRG4PC50F-E	
		60	1.50						IRG4PC60F		
	8-30 kHz	5	2.15		IRG4RC10U						
		7	1.85				IRG4BC20U		IRG4PC20U		
		12	1.50					IRG6IC30U			
		12	1.95				IRG4BC30U		IRG4PC30U		
		20	1.72				IRG4BC40U		IRG4PC40U		
		27	1.65						IRG4PC50U		
		33	1.70								
		40	1.70						IRG4PC60U		
		60	1.67								IRG4PSC71U
	30-150 kHz	6	2.16					IRG4IBC20W			
		7	2.16			IRG4BC20W-S	IRG4BC20W				
		8	2.10					IRG4IBC30W			
		12	2.10			IRG4BC30W-S	IRG4BC30W		IRG4PC30W		
		20	2.05	IRG4BC40W-L		IRG4BC40W-S	IRG4BC40W		IRG4PC40W		
		27	1.93						IRG4PC50W		
900		28	2.25						IRG4PF50W		
1,000	8-30 kHz	30	1.90						IRG7PG35U	IRG7PG35U-E	
1,200	DC-1 kHz	33	1.47						IRG4PH50S	IRG4PH50S-E	
	8-30 kHz	20	3.05							IRGP20B120U-E	
		21	2.43						IRG4PH40U		
		24	2.78						IRG4PH50U	IRG4PH50U-E	
		35	1.90						IRG7PH35U	IRG7PH35U-E	
		40	3.12								IRGPS40B120U
		50	2.52								IRG4PSH71U
		60	1.70						IRG7PH42U	IRG7PH42U-E	
		75	1.70						IRG7PH46U	IRG7PH46U-E	
		90	1.70						IRG7PH50U	IRG7PH50U-E	

International
IOR Rectifier
THE POWER MANAGEMENT LEADER

Technical Assistance Center (TAC)

- Speak Directly to Knowledgeable Application Engineers
- Languages: English, German, Mandarin, Spanish
- Global Presence for 24-Hour Engineering Support
- Submit Questions On-line with the Capability of Tracking your Requests
- 24-Hour Response Time
- Access to Extensive Library of Frequently Asked Questions

Types of Inquiries Supported by TAC include:

- Assistance with Design-In of IR Technologies
- Application Assistance
- Trouble-Shooting Customer Designs
- Product Selection
- Verification of Product Datasheet Parameters
- Cross Reference and Replacement Recommendations
- Assistance with Orderable Part Numbers

TAC : Real Engineers, Real Time

Your Application Engineering Resource for IR