

International IOR Rectifier

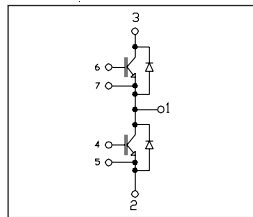
GA100TS60SF

"HALF-BRIDGE" IGBT INT-A-PAK

Standard Speed IGBT

Features

- Standard Speed PT IGBT Technology
- Fred PT Antiparallel diodes with Fast recovery
- Very Low Conduction Losses
- Al_2O_3 DBC
- UL Pending



$V_{CES} = 600\text{V}$
 $I_C = 220\text{A DC}$
 $V_{CE(on)} \text{ typ.} = 1.39\text{V}$
 @ $I_C = 200\text{A } T_J = 25^\circ\text{C}$

Benefits

- Optimized for high current inverter stages (AC TIG welding machines)
- Direct mounting to heatsink
- Hard switching operation frequency up to 1 KHz
- Very low junction-to-case thermal resistance
- Low EMI



Absolute Maximum Ratings

Parameters			Max	Units
V_{CES}	Collector-to-Emitter Voltage		600	V
I_C	Continuos Collector Current	@ $T_C = 25^\circ\text{C}$	220	A
		@ $T_C = 130^\circ\text{C}$	100	
I_{CM}	Pulsed Collector Current		440	
I_{LM}	Peak Switching Current		440	
V_{GE}	Gate-to-Emitter Voltage		± 20	V
V_{ISOL}	RMS Isolation Voltage, Any Terminal to Case, $t = 1 \text{ min}$		2500	
P_D	Maximum Power Dissipation	@ $T_C = 25^\circ\text{C}$	780	W
		@ $T_C = 100^\circ\text{C}$	312	

Electrical Characteristics @ T_J = 25°C (unless otherwise specified)

Parameters	Min	Typ	Max	Units	Test Conditions
V _{BR} CEs Collector-to-Emitter Breakdown Voltage	600			V	V _{GE} = 0V, I _C = 1mA
V _{CE(on)} Collector-to-Emitter Voltage		1.11	1.28		V _{GE} = 15V, I _C = 100A
		1.39			I _C = 200A
		1.08	1.22		V _{GE} = 15V, I _C = 100A, T _J = 125°C
V _{GE(th)} Gate Threshold Voltage	3		6		I _C = 0.25mA
I _{CES} Collector-to-Emitter Leakage Current			1	mA	V _{GE} = 0V, V _{CE} = 600V
			10		V _{GE} = 0V, V _{CE} = 600V, T _J = 125°C
V _{FM} Diode Forward Voltage drop		1.44	1.96	V	I _C = 100A, V _{GE} = 0V
		1.25	1.54		I _C = 100A, V _{GE} = 0V, T _J = 125°C
I _{GES} Gate-to-Emitter Leakage Current			± 250	nA	V _{GE} = ± 20V

Switching Characteristics @ T_J = 25°C (unless otherwise specified)

Parameters	Min	Typ	Max	Units	Test Conditions
Q _g Total Gate Charge		640	700	nC	I _C = 100A V _{CC} = 400V V _{GE} = 15V
Q _{ge} Gate-Emitter Charge		108	120		
Q _{gc} Gate-Collector Charge		230	300		
t _r Rise Time		0.45		μs	I _C = 100A, V _{CC} = 480V, V _{GE} = 15V R _g = 15Ω
t _f Fall Time		1.0			
E _{on} Turn-On Switching Energy		4	6	mJ	I _C = 100A, V _{CC} = 480V, V _{GE} = 15V R _g = 15Ω, T _J = 125°C
E _{off} Turn-Off Switching Energy		23	29		
E _{ts} Total Switching Energy		27	35		
E _{on} Turn-On Switching Energy		6	12	mJ	I _C = 100A, V _{CC} = 480V, V _{GE} = 15V R _g = 15Ω, T _J = 125°C
E _{off} Turn-Off Switching Energy		35	40		
E _{ts} Total Switching Energy		41	52		
C _{ies} Input Capacitance		16250		pF	V _{GE} = 0V V _{CC} = 30V f = 1.0 MHz
C _{oes} Output Capacitance		1040			
C _{res} Reverse Transfer Capacitance		190			
t _{rr} Diode Reverse Recovery Time		91	155	ns	I _F = 50A, dI _F /dt = 200A/μs V _{RR} = 200V
I _{rr} Diode Peak Reverse Current		10.6	15	A	
Q _{rr} Diode Recovery Charge		500	900	nC	
t _{rr} Diode Reverse Recovery Time		180	344	ns	I _F = 50A, dI _F /dt = 200A/μs V _{RR} = 200V T _J = 125°C
I _{rr} Diode Peak Reverse Current		17	20.5	A	
Q _{rr} Diode Recovery Charge		1633	2315	nC	

Thermal- Mechanical Specifications

Parameters	Min	Typ	Max	Units
T _J Operating Junction Temperature Range	- 40		150	°C
T _{STG} Storage Temperature Range	- 40		125	
R _{thJC} Junction-to-Case	per Switch		0.16	°C/ W
	Per Diode		0.48	
R _{thCS} Case-to-Sink	Per Module	0.1		
T Mounting torque	Case to heatsink		4	Nm
	Case to terminal 1, 2, 3		3	
Weight		185		g

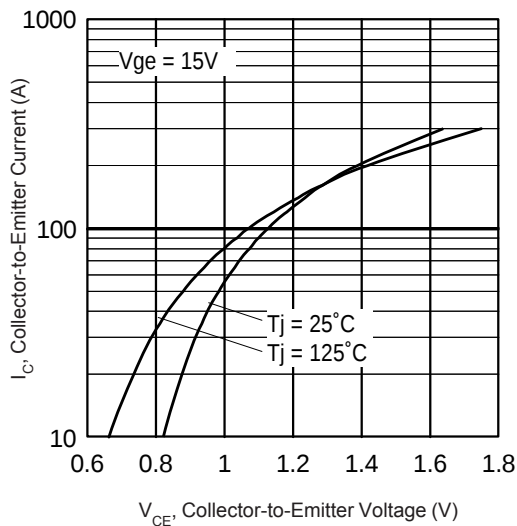


Fig. 1 - Typical Output Characteristics

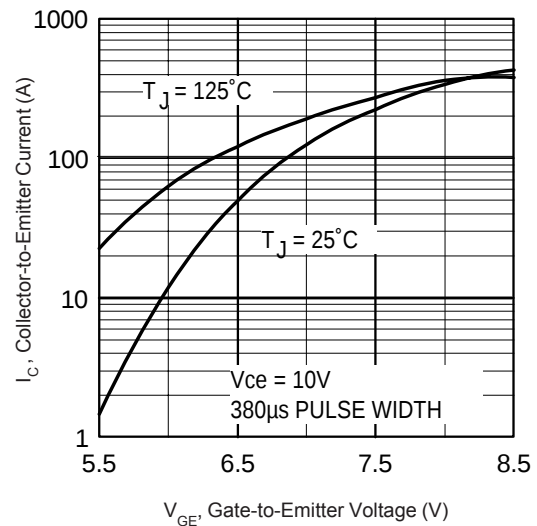


Fig. 2 - Typical Transfer Characteristics

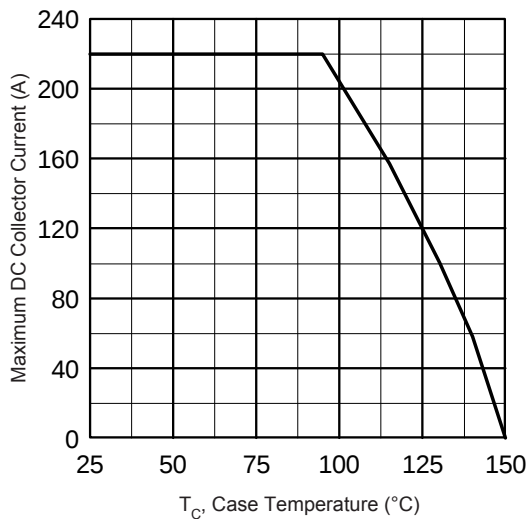


Fig. 3 - Maximum Collector Current
vs. Case Temperature

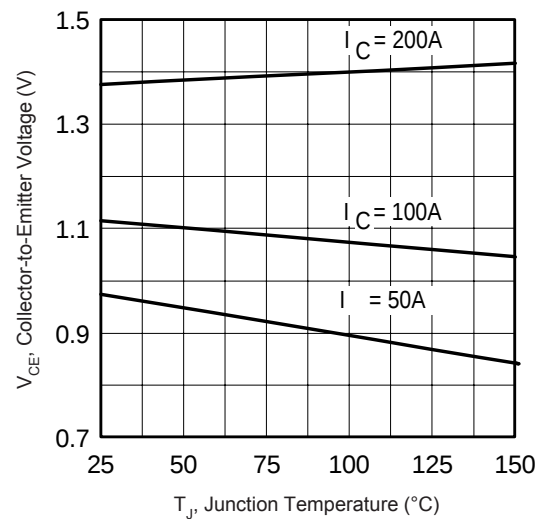


Fig. 4 - Typical Collector-to-Emitter Voltage
vs. Junction Temperature

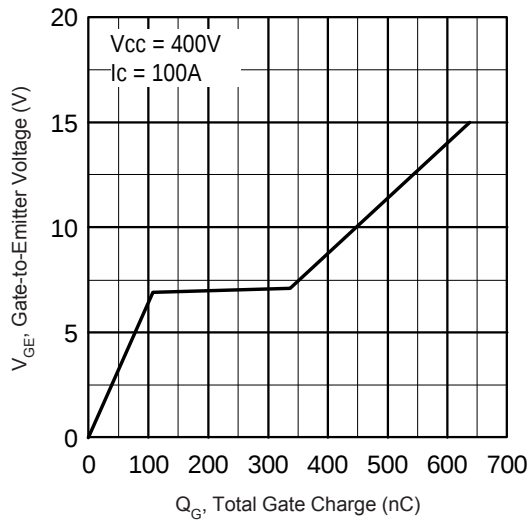


Fig. 5 - Typical Gate Charge vs. Gate-to-Emitter Voltage

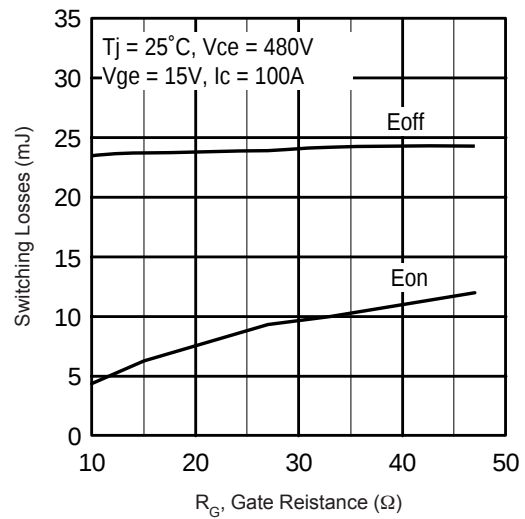


Fig. 6 - Typical Switching Losses vs Gate Resistance

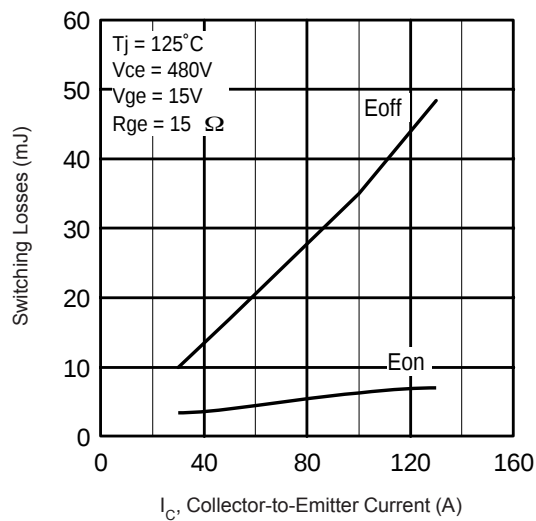


Fig. 7 - Typical Switching Losses vs Collector-to-Emitter Current

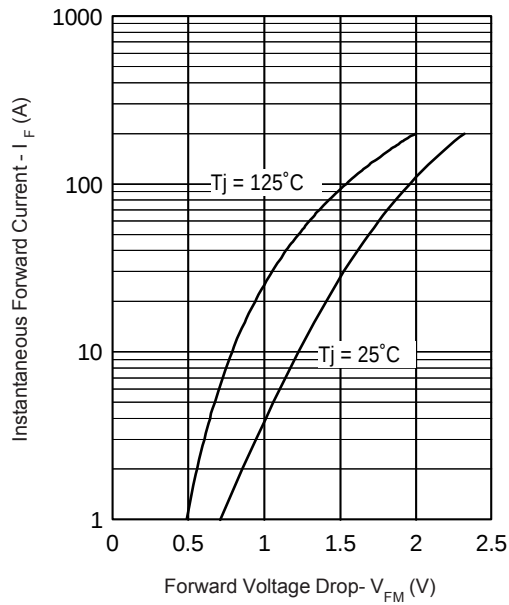


Fig. 8 - Maximum Forward Voltage Drop vs. Instantaneous Forward Current

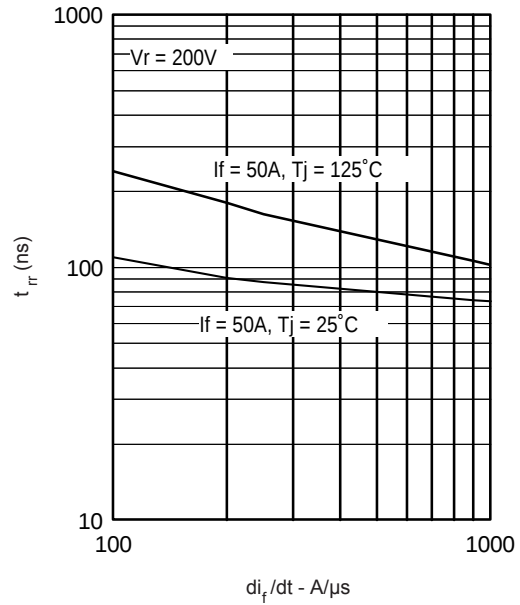


Fig. 9 - Typical Reverse Recovery vs. di_f/dt

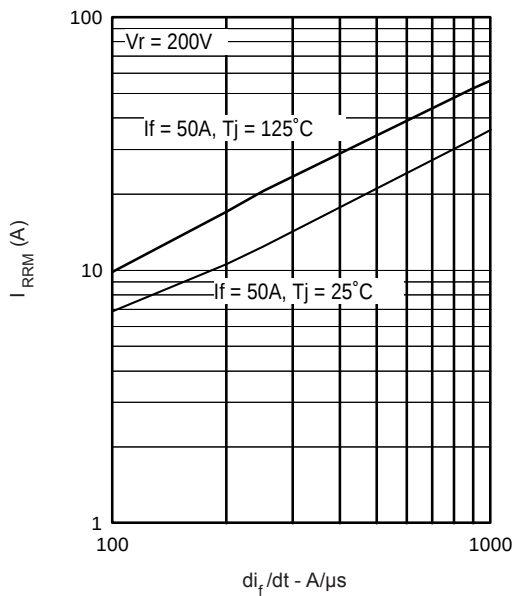


Fig. 10 - Typical Reverse Recovery Current vs. di_f/dt

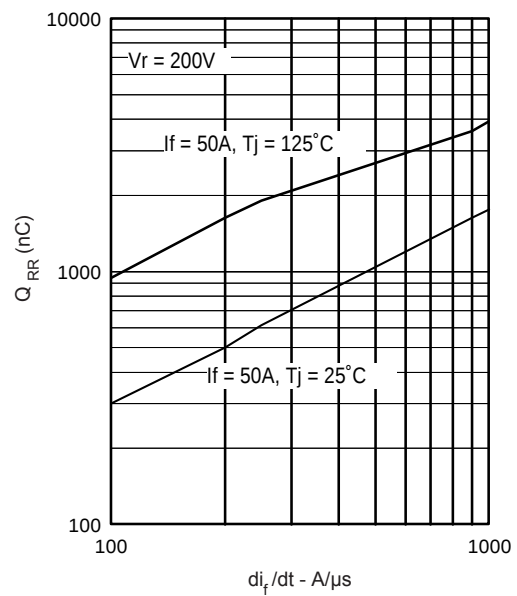
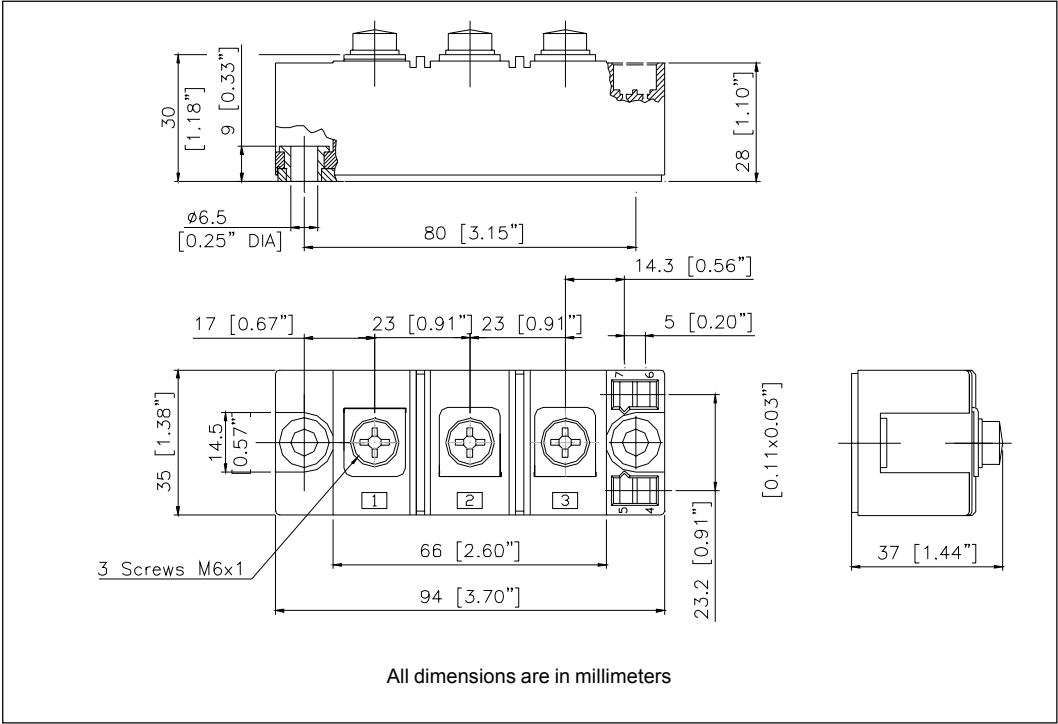


Fig. 11 - Typical Stored Charge vs. di_f/dt

Outline Table



Ordering Information Table

Device Code						
GA	100	T	S	60	S	F
1	2	3	4	5	6	7
1	Essential Part Number IGBT modules					
2	Current rating (100 = 100A)					
3	Circuit Configuration (T = Half Bridge)					
4	Int-A-Pak					
5	Voltage Code (60 = 600V)					
6	Speed/ Type (S = Standard Speed IGBT)					
7	Diode Type					

Data and specifications subject to change without notice.
This product has been designed for Industrial Level.
Qualification Standards can be found on IR's Web site.

International
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