

Bulletin I27222 03/06

International IOR Rectifier

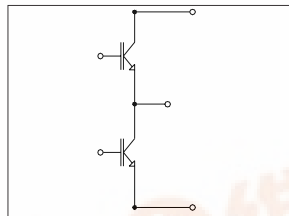
GA200HS60S1

"HALF-BRIDGE" IGBT INT-A-PAK

Standard Speed IGBT

Features

- Generation 4 IGBT Technology
- Standard speed: optimized for hard switching operating frequencies up to 1000 Hz
- Very Low Conduction Losses
- Industry standard package



$V_{CES} = 600V$
 $V_{CE(on) typ.} = 1.13V @$
 $V_{GE} = 15V, I_C = 200A$
 $T_J = 25^\circ C$

Benefits

- Increased operating efficiency
- Direct mounting to heatsink
- Performance optimized as output inverter stage for TIG welding machines



Absolute Maximum Ratings

Parameters		Max	Units
V_{CES}	Collector-to-Emitter Voltage	600	V
I_C	Continuos Collector Current	@ $T_C = 25^\circ C$	480
		@ $T_C = 110^\circ C$	220
I_{CM}	Pulsed Collector Current	800	
I_{LM}	Peak Switching Current	800	
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	@ $T_C = 25^\circ C$	830
		@ $T_C = 85^\circ C$	430

Electrical Characteristics @ $T_J = 25^\circ\text{C}$ (unless otherwise specified)

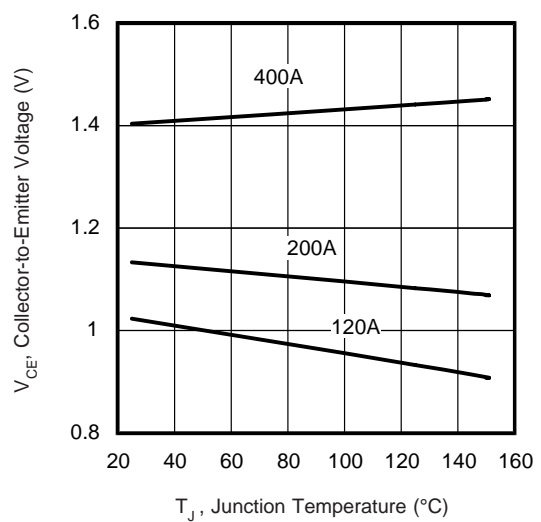
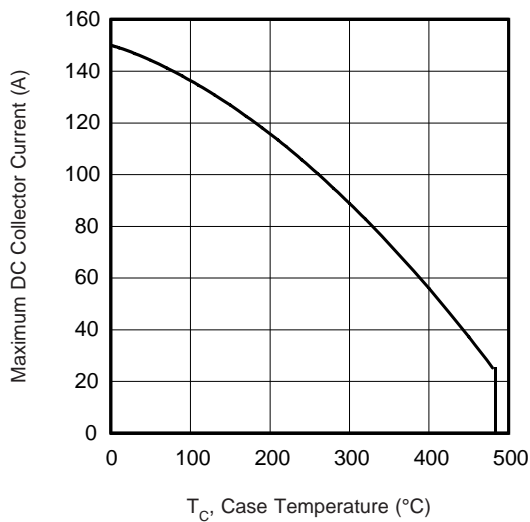
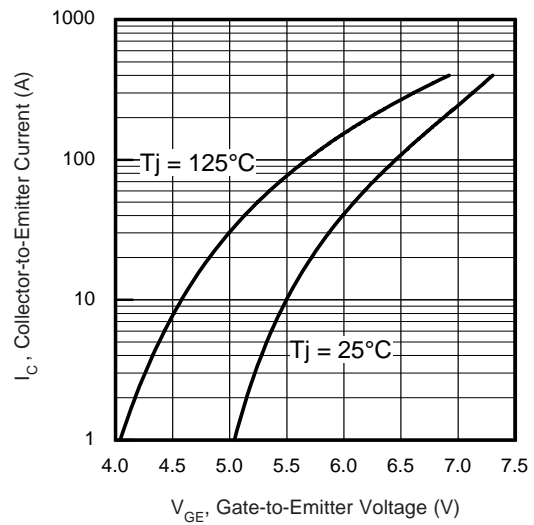
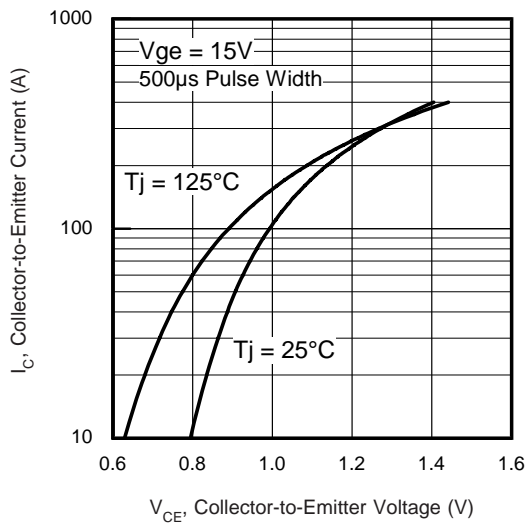
Parameters		Min	Typ	Max	Units	Test Conditions
V_{CES}	Collector-to-Emitter Breakdown Voltage	600			V	$V_{GE} = 0\text{V}$, $I_C = 1\text{mA}$
$V_{CE(on)}$	Collector-to-Emitter Voltage		1.13	1.21		$V_{GE} = 15\text{V}$, $I_C = 200\text{A}$
			1.08	1.18		$V_{GE} = 15\text{V}$, $I_C = 200\text{A}$, $T_J = 125^\circ\text{C}$
$V_{GE(th)}$	Gate Threshold Voltage	3	4.5	6		$I_C = 0.25\text{mA}$
I_{CES}	Collector-to-Emitter Leakage Current		0.025	1	mA	$V_{GE} = 0\text{V}$, $V_{CE} = 600\text{V}$
				10		$V_{GE} = 0\text{V}$, $V_{CE} = 600\text{V}$, $T_J = 125^\circ\text{C}$
I_{GES}	Gate-to-Emitter Leakage Current			± 250	nA	$V_{GE} = \pm 20\text{V}$

Switching Characteristics @ $T_J = 25^\circ\text{C}$ (unless otherwise specified)

Parameters		Min	Typ	Max	Units	Test Conditions
Q_g	Total Gate Charge		1600	1700	nC	$I_C = 200\text{A}$ $V_{CC} = 400\text{V}$ $V_{GE} = 15\text{V}$
Q_{ge}	Gate-Emitter Charge		260	340		
Q_{gc}	Gate-Collector Charge		580	670		
E_{on}	Turn-On Switching Loss		30		mJ	$I_C = 200\text{A}$, $V_{CC} = 480\text{V}$, $V_{GE} = 15\text{V}$ $R_g = 10\Omega$ free-wheeling DIODE: 30EPH06
E_{off}	Turn-Off Switching Loss		50			
E_{ts}	Total Switching Loss		80			
E_{on}	Turn-On Switching Loss		34		mJ	$I_C = 200\text{A}$, $V_{CC} = 480\text{V}$, $V_{GE} = 15\text{V}$ $R_g = 10\Omega$ free-wheeling DIODE: 30EPH06, $T_J = 125^\circ\text{C}$
E_{off}	Turn-Off Switching Loss		104			
E_{ts}	Total Switching Loss		106	121		
C_{ies}	Input Capacitance		32500		pF	$V_{GE} = 0\text{V}$ $V_{CC} = 30\text{V}$ $f = 1.0\text{MHz}$
C_{oes}	Output Capacitance		2080			
C_{res}	Reverse Transfer Capacitance		380			

Thermal- Mechanical Specifications

Parameters		Min	Typ	Max	Units
T_J	Operating Junction Temperature Range	- 40		150	$^\circ\text{C}$
T_{STG}	Storage Temperature Range	- 40		125	
R_{thJC}	Junction-to-Case (Per Leg)			0.15	$^\circ\text{C}/\text{W}$
R_{thCS}	Case-to-Sink		0.1		
T	Mounting torque	Case to heatsink		4	Nm
		Case to terminal 1, 2, 3		3	
	Weight		185		g



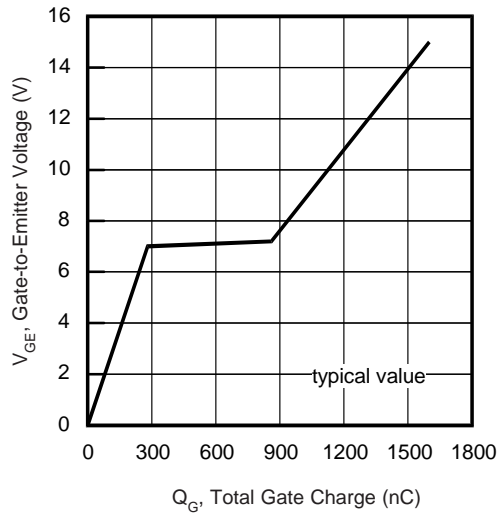


Fig. 5 - Typical Gate Charge vs. Gate-to-Emitter Voltage

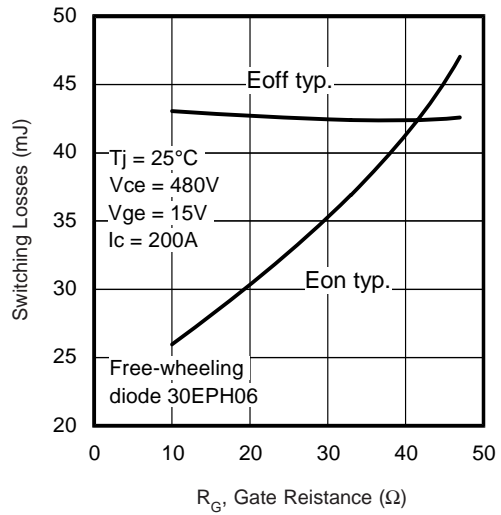


Fig. 6 - Typical Switching Losses vs Gate Resistance

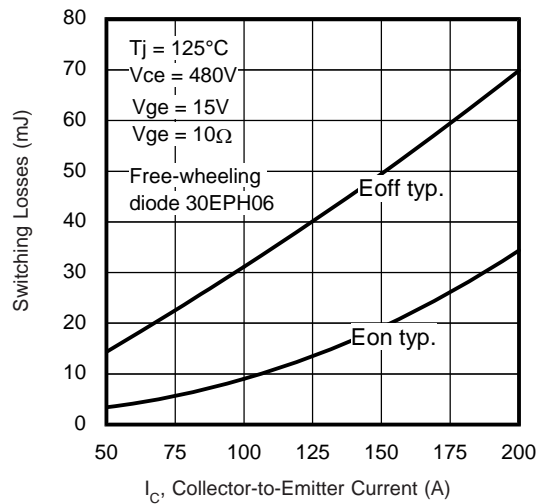
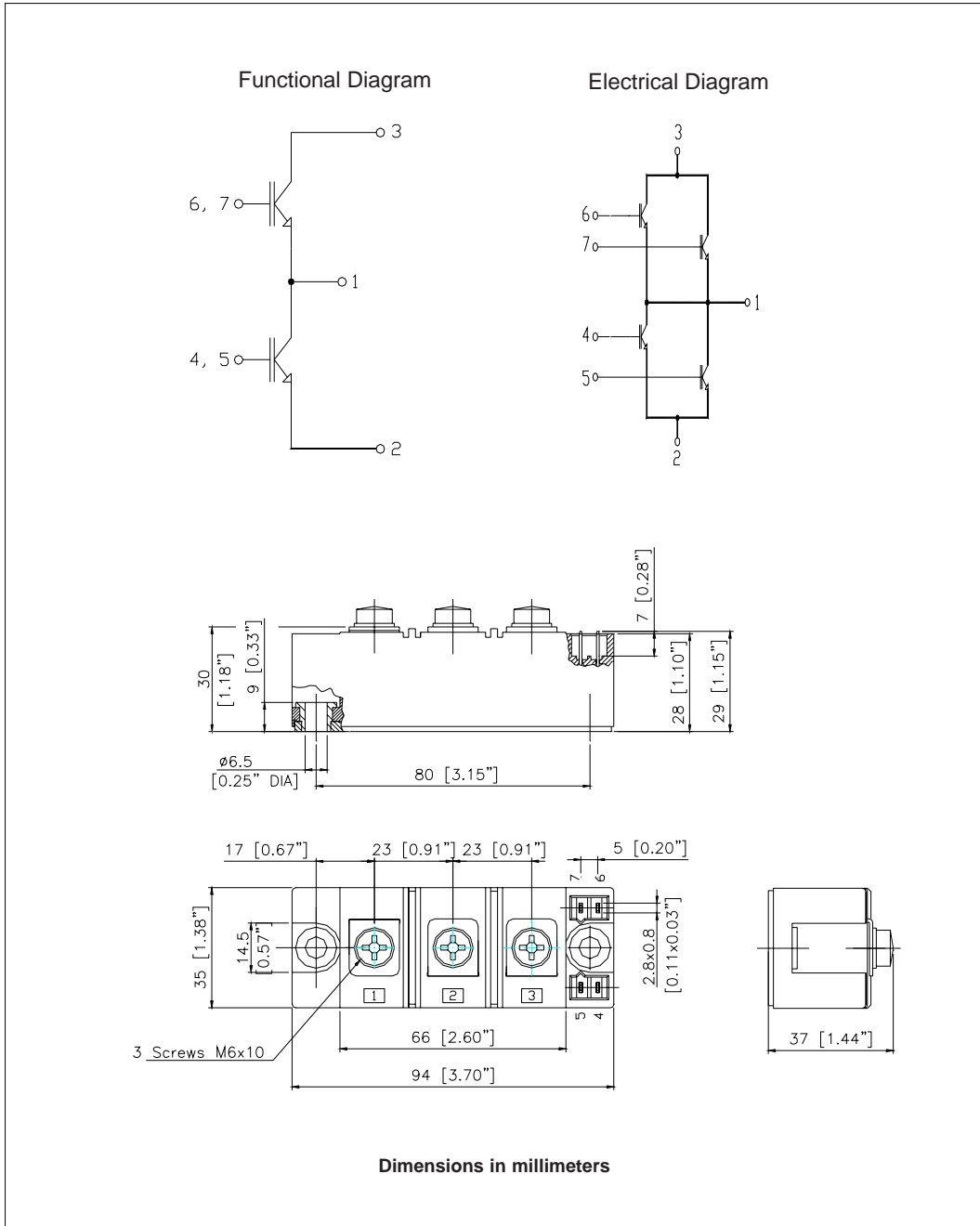


Fig. 7 - Typical Switching Losses vs Collector-to-Emitter Current

Outline Table



Ordering Information Table

Device Code															
	<table border="1" style="margin: auto;"> <tr> <td style="padding: 5px;">GA</td> <td style="padding: 5px;">200</td> <td style="padding: 5px;">H</td> <td style="padding: 5px;">S</td> <td style="padding: 5px;">60</td> <td style="padding: 5px;">S</td> <td style="padding: 5px;">1</td> </tr> <tr> <td style="text-align: center;">①</td> <td style="text-align: center;">②</td> <td style="text-align: center;">③</td> <td style="text-align: center;">④</td> <td style="text-align: center;">⑤</td> <td style="text-align: center;">⑥</td> <td style="text-align: center;">⑦</td> </tr> </table>	GA	200	H	S	60	S	1	①	②	③	④	⑤	⑥	⑦
GA	200	H	S	60	S	1									
①	②	③	④	⑤	⑥	⑦									
1	- Essential Part Number IGBT modules														
2	- Current rating (200 = 200A)														
3	- Circuit Configuration (H = Half Bridge without f/w diode)														
4	- Int-A-Pak														
5	- Voltage Code (60 = 600V)														
6	- Speed/ Type (S = Standard Speed IGBT)														
7	- Assy location IRCI														

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

International
IR Rectifier

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