

"Half-Bridge" IGBT INT-A-PAK (Standard Speed IGBT), 200 A



INT-A-PAK

FEATURES

- Generation 4 IGBT technology
- Standard: Optimized for hard switching speed DC to 1 kHz
- Very low conduction losses
- Industry standard package
- UL approved file E78996 
- Compliant to RoHS directive 2002/95/EC
- Designed and qualified for industrial level

RoHS
COMPLIANT

PRODUCT SUMMARY

V_{CES}	600 V
I_C DC	480 A
$V_{CE(on)}$ at 200 A, 25 °C	1.13 V

BENEFITS

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

ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	TEST CONDITIONS	MAX.	UNITS
Collector to emitter voltage	V_{CES}		600	V
Continuous collector current	I_C	$T_C = 25\text{ °C}$	480	A
		$T_C = 116\text{ °C}$	200	
Pulsed collector current	I_{CM}		800	
Peak switching current	I_{LM}		800	
Gate to emitter voltage	V_{GE}		± 20	V
RMS isolation voltage	V_{ISOL}	Any terminal to case, $t = 1$ minute	2500	
Maximum power dissipation	P_D	$T_C = 25\text{ °C}$	830	W
		$T_C = 85\text{ °C}$	430	

ELECTRICAL SPECIFICATIONS ($T_J = 25\text{ °C}$ unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNITS
Collector to emitter breakdown voltage	$V_{BR(CES)}$	$V_{GE} = 0\text{ V}$, $I_C = 1\text{ mA}$	600	-	-	V
Collector to emitter voltage	$V_{CE(on)}$	$V_{GE} = 15\text{ V}$, $I_C = 200\text{ A}$	-	1.13	1.21	
		$V_{GE} = 15\text{ V}$, $I_C = 200\text{ A}$, $T_J = 125\text{ °C}$	-	1.08	1.18	
Gate threshold voltage	$V_{GE(th)}$	$I_C = 0.25\text{ mA}$	3	4.5	6	
Collector to emitter leakage current	I_{CES}	$V_{GE} = 0\text{ V}$, $V_{CE} = 600\text{ V}$	-	0.025	1	mA
		$V_{GE} = 0\text{ V}$, $V_{CE} = 600\text{ V}$, $T_J = 125\text{ °C}$	-	-	10	
Gate to emitter leakage current	I_{GES}	$V_{GE} = \pm 20\text{ V}$	-	-	± 250	nA

SWITCHING CHARACTERISTICS ($T_J = 25\text{ }^{\circ}\text{C}$ unless otherwise specified)						
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNITS
Total gate charge	Q_g	$I_C = 200\text{ A}$ $V_{CC} = 400\text{ V}$ $V_{GE} = 15\text{ V}$	-	1600	1700	nC
Gate to emitter charge	Q_{ge}		-	260	340	
Gate to collector charge	Q_{gc}		-	580	670	
Turn-on switching loss	E_{on}	$I_C = 200\text{ A}$, $V_{CC} = 480\text{ V}$, $V_{GE} = 15\text{ V}$ $R_g = 10\text{ }\Omega$ Freewheeling diode: 30EPH06, $T_J = 25\text{ }^{\circ}\text{C}$	-	30	-	mJ
Turn-off switching loss	E_{off}		-	50	-	
Total switching loss	E_{ts}		-	80	-	
Turn-on switching loss	E_{on}	$I_C = 200\text{ A}$, $V_{CC} = 480\text{ V}$, $V_{GE} = 15\text{ V}$ $R_g = 10\text{ }\Omega$ Freewheeling diode: 30EPH06, $T_J = 125\text{ }^{\circ}\text{C}$	-	34	-	mJ
Turn-off switching loss	E_{off}		-	104	-	
Total switching loss	E_{ts}		-	138	151	
Input capacitance	C_{ies}	$V_{GE} = 0\text{ V}$ $V_{CC} = 30\text{ V}$ $f = 1.0\text{ MHz}$	-	32 500	-	pF
Output capacitance	C_{oes}		-	2080	-	
Reverse transfer capacitance	C_{res}		-	380	-	

THERMAL AND MECHANICAL SPECIFICATIONS					
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNITS
Operating junction temperature range	T_J	- 40	-	150	$^{\circ}\text{C}$
Storage temperature range	T_{Stg}	- 40	-	125	
Junction to case per leg	R_{thJC}	-	-	0.15	$^{\circ}\text{C/W}$
Case to sink	R_{thCS}	-	0.1	-	
Mounting torque	case to heatsink	-	-	4	Nm
	case to terminal 1, 2, 3	-	-	3	
Weight		-	185	-	g

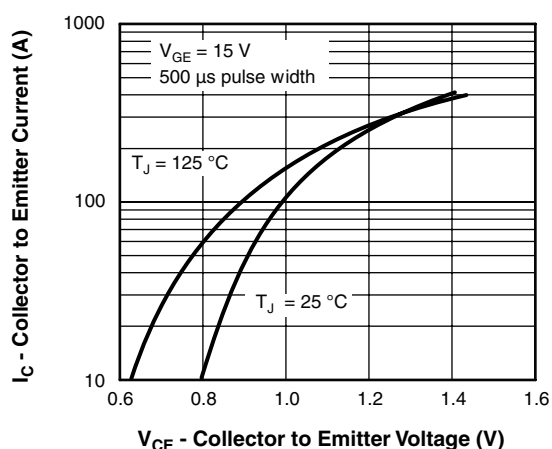


Fig. 1 - Typical Output Characteristics

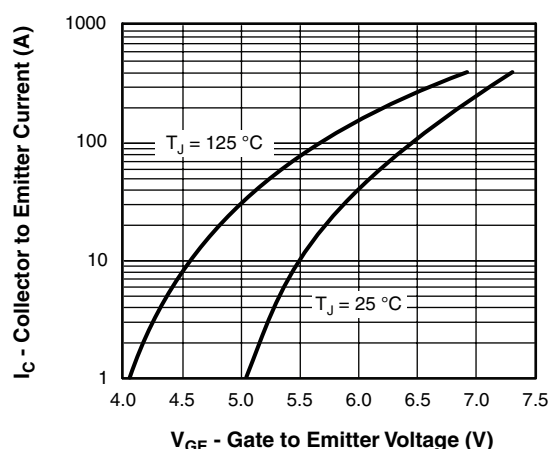


Fig. 2 - Typical Transfer Characteristics

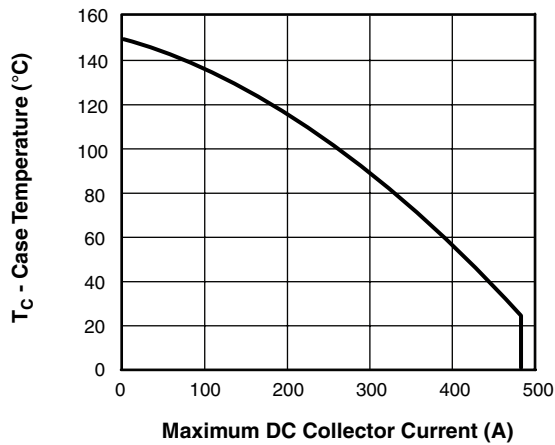


Fig. 3 - Case Temperature vs. Maximum Collector Current

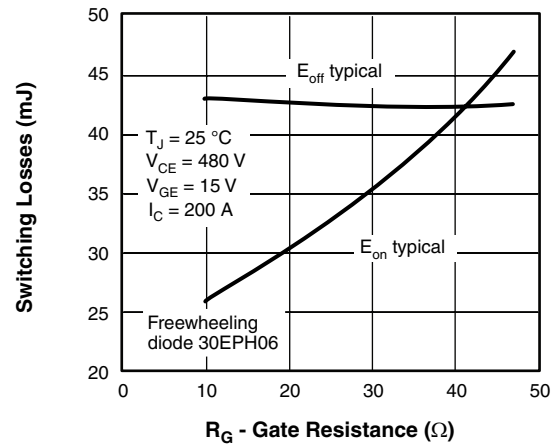


Fig. 6 - Typical Switching Losses vs. Gate Resistance

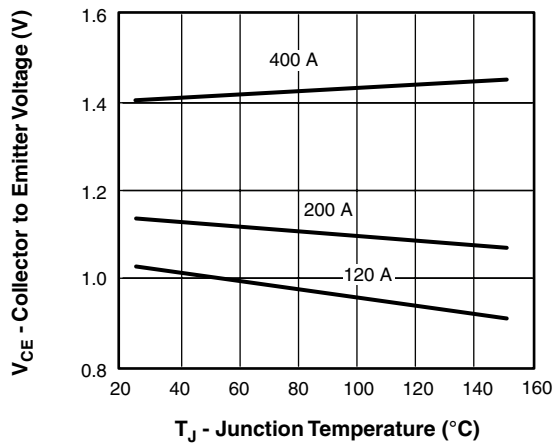


Fig. 4 - Typical Collector to Emitter Voltage vs. Junction Temperature

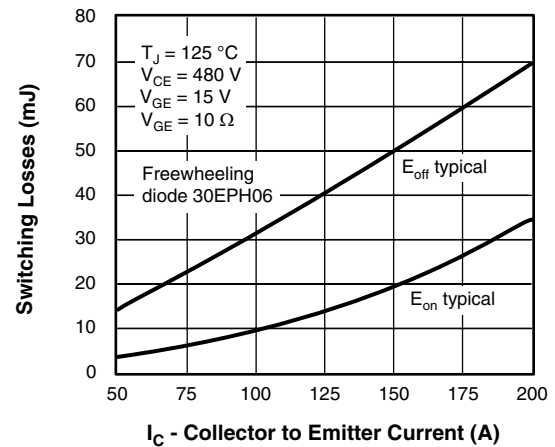


Fig. 7 - Typical Switching Losses vs. Collector to Emitter Current

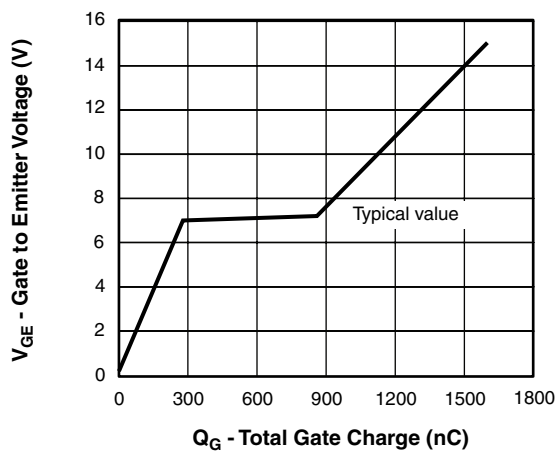
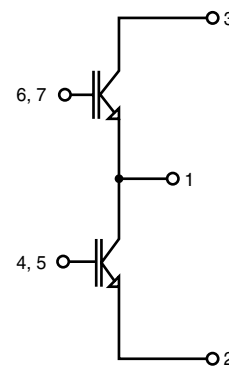
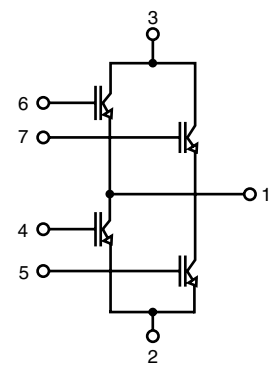


Fig. 5 - Typical Gate Charge vs. Gate to Emitter Voltage



Functional Diagram



Electrical Diagram

GA200HS60S1PbF



Vishay High Power Products "Half-Bridge" IGBT INT-A-PAK
(Standard Speed IGBT), 200 A

ORDERING INFORMATION TABLE

Device code	GA	200	H	S	60	S	1	PbF
	①	②	③	④	⑤	⑥	⑦	⑧
①	- Essential part number IGBT modules							
②	- Current rating (200 = 200 A)							
③	- Circuit configuration (H = Half bridge without f/w diode)							
④	- INT-A-PAK							
⑤	- Voltage code (60 = 600 V)							
⑥	- Speed/type (S = Standard speed IGBT)							
⑦	- Assy location Italy							
⑧	- PbF = Lead (Pb)-free							

LINKS TO RELATED DOCUMENTS	
Dimensions	www.vishay.com/doc?95067

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