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

INT-A-PAK

FEATURES

- Gen 4 IGBT technology
- Standard: optimized for hard switching speed
- Very low conduction losses
- Industry standard package
- UL approved file E78996
- Designed and qualified for industrial level
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

Pb-free

RoHS COMPLIANT

BENEFITS

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

PRIMARY CHARACTERISTICS	
V_{CES}	600 V
I_C DC	480 A
$V_{CE(on)}$ at 200 A, 25 °C	1.13 V
Speed	DC to 1 kHz
Package	INT-A-PAK
Circuit configuration	Half bridge

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 °C	480	A
		T_C = 116 °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 min	2500	
Maximum power dissipation	P_D	T_C = 25 °C	830	W
		T_C = 85 °C	430	
Operating junction temperature range	T_J		-40 to +150	°C
Storage temperature range	T_{Stg}		-40 to +125	

ELECTRICAL SPECIFICATIONS (T_J = 25 °C unless otherwise specified)						
Collector to emitter breakdown voltage	$V_{BR(CES)}$	V_{GE} = 0 V, I_C = 1 mA	600	-	-	V
Collector to emitter voltage	$V_{CE(on)}$	V_{GE} = 15 V, I_C = 200 A	-	1.13	1.21	
		V_{GE} = 15 V, I_C = 200 A, T_J = 125 °C	-	1.08	1.18	
Gate threshold voltage	$V_{GE(th)}$	I_C = 0.25 mA	3	4.5	6	
Collector to emitter leakage current	I_{CES}	V_{GE} = 0 V, V_{CE} = 600 V	-	0.025	1	mA
		V_{GE} = 0 V, V_{CE} = 600 V, T_J = 125 °C	-	-	10	
Gate to emitter leakage current	I_{GES}	V_{GE} = ± 20 V	-	-	± 250	nA

SWITCHING CHARACTERISTICS (T_J = 25 °C unless otherwise specified)						
PARAMETER	**SYMBOL**	**TEST CONDITIONS**	**MIN.**	**TYP.**	**MAX.**	**UNITS**
Total gate charge	Q_g	I_C = 200 A V_{CC} = 400 V V_{GE} = 15 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 A, V_{CC} = 480 V, V_{GE} = 15 V R_g = 10 Ω Freewheeling diode: 30EPH06, T_J = 25 °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 A, V_{CC} = 480 V, V_{GE} = 15 V R_g = 10 Ω Freewheeling diode: 30EPH06, T_J = 125 °C	-	34	-	mJ
Turn-off switching loss	E_{off}		-	104	-	
Total switching loss	E_{ts}		-	138	151	
Input capacitance	C_{ies}	V_{GE} = 0 V V_{CC} = 30 V f = 1.0 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	°C
Storage temperature range		T_{Stg}	-40	-	125	
Junction to case per leg		R_{thJC}	-	-	0.15	°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

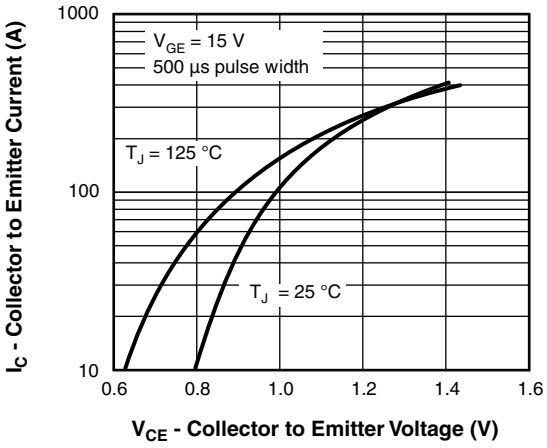


Fig. 1 - Typical Output Characteristics

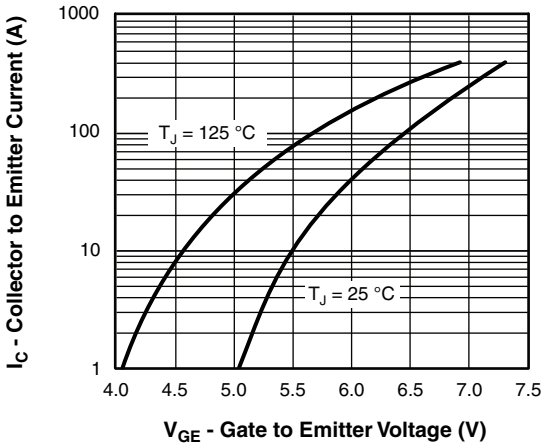


Fig. 2 - Typical Transfer Characteristics

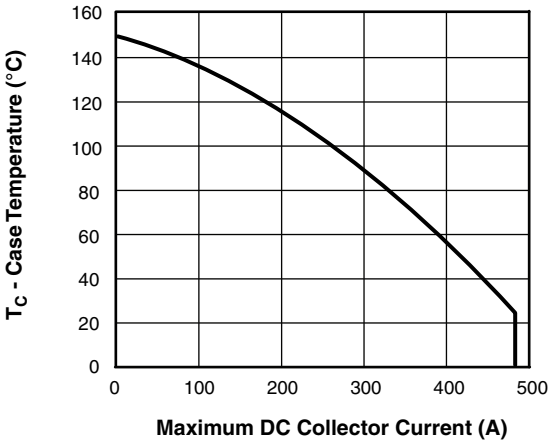


Fig. 3 - Case Temperature vs. Maximum Collector Current

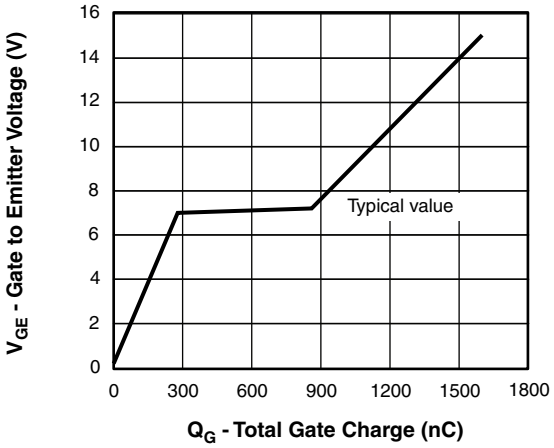


Fig. 5 - Typical Gate Charge vs. Gate to Emitter Voltage

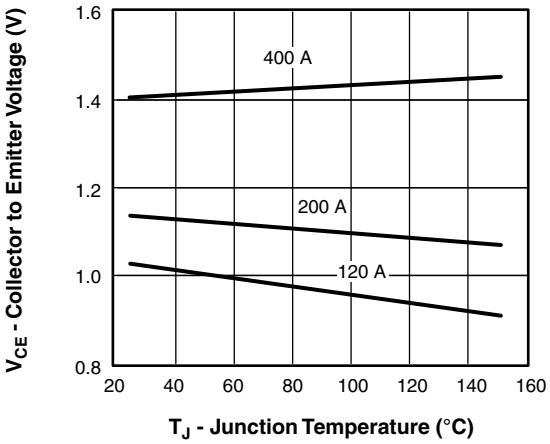


Fig. 4 - Typical Collector to Emitter Voltage vs. Junction Temperature

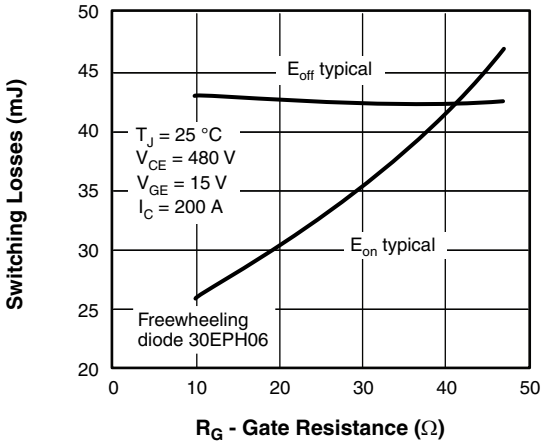


Fig. 6 - Typical Switching Losses vs. Gate Resistance

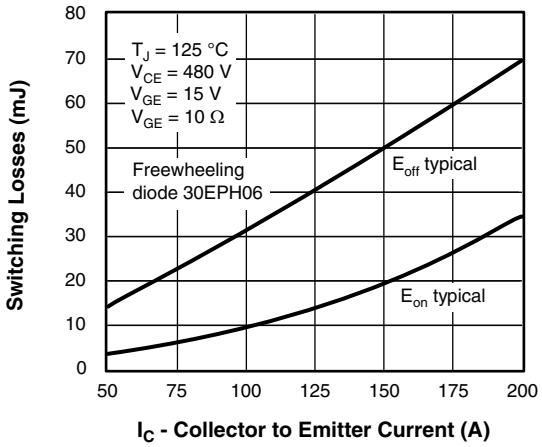


Fig. 7 - Typical Switching Losses vs. Collector to Emitter Current

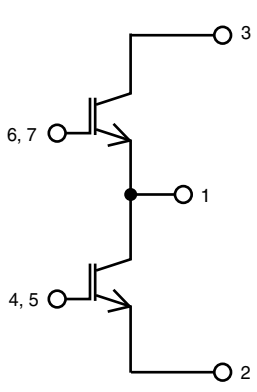
ORDERING INFORMATION TABLE

Device code

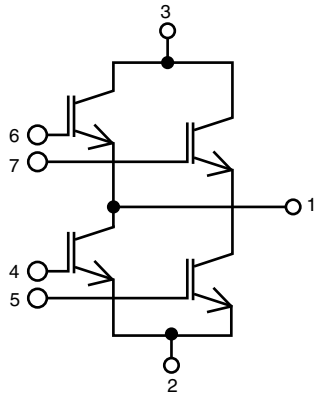
VS-	GA	200	H	S	60	S	1	PbF
1	2	3	4	5	6	7	8	9

- 1 - Vishay Semiconductors product
- 2 - Essential part number IGBT modules
- 3 - Current rating (200 = 200 A)
- 4 - Circuit configuration (H = half bridge without f/w diode)
- 5 - INT-A-PAK
- 6 - Voltage code (60 = 600 V)
- 7 - Speed/type (S = standard speed IGBT)
- 8 - Assy location Italy
- 9 - None = standard production; PbF = lead (Pb)-free

CIRCUIT CONFIGURATION



Functional Diagram

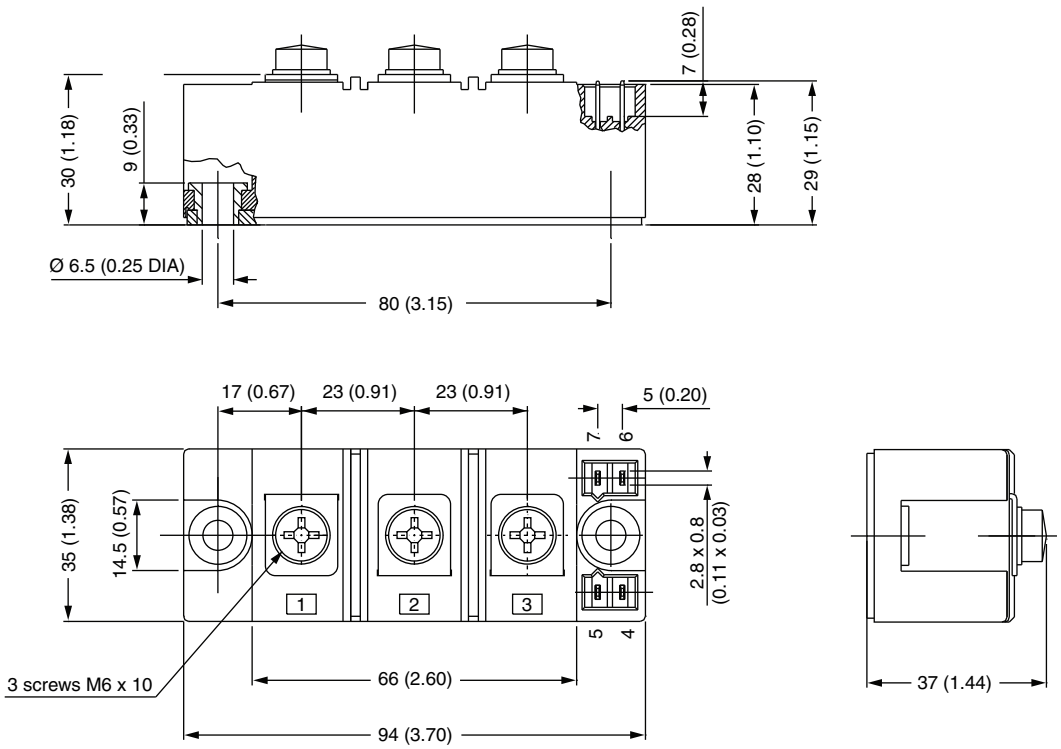


Electrical Diagram

LINKS TO RELATED DOCUMENTS	
Dimensions	www.vishay.com/doc?95173

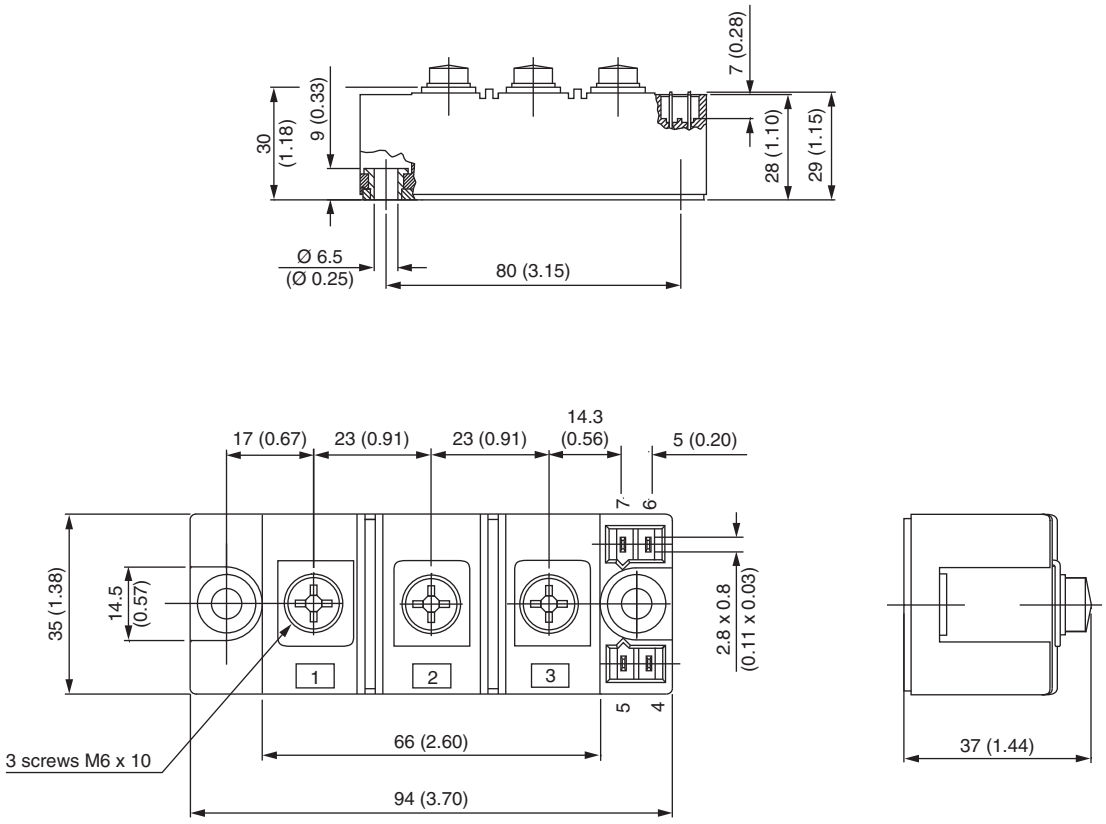
INT-A-PAK IGBT/Thyristor

DIMENSIONS in millimeters (inches)



INT-A-PAK IGBT

DIMENSIONS in millimeters (inches)



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