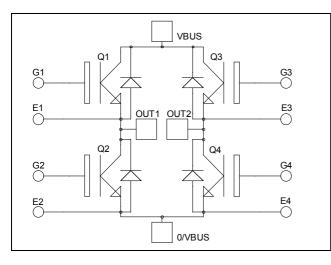
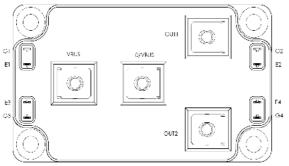


Full - bridge NPT IGBT Power Module





$V_{CES} = 600V$ $I_{C} = 180A$ @ Tc = 80°C

Application

- Welding converters
 - Switched Mode Power Supplies
- Uninterruptible Power Supplies
- Motor control

Features

- Non Punch Through (NPT) Fast IGBT
 - Low voltage drop
 - Low tail current
 - Switching frequency up to 100 kHz
 - Soft recovery parallel diodes
 - Low diode VF
 - Low leakage current
 - RBSOA and SCSOA rated
- Kelvin emitter for easy drive
- Very low stray inductance
 - Symmetrical design
 - M5 power connectors
- High level of integration

Benefits

- Outstanding performance at high frequency operation
- Stable temperature behavior
- Very rugged
- Direct mounting to heatsink (isolated package)
- Low junction to case thermal resistance
- Easy paralleling due to positive TC of VCEsat
- Low profile
- RoHS compliant

Absolute maximum ratings

Symbol	Parameter		Max ratings	Unit
V _{CES}	Collector - Emitter Breakdown Voltage		600	V
I _C	Continuous Collector Current	$T_c = 25^{\circ}C$	220	
	Continuous Conector Current	$T_c = 80^{\circ}C$	180	Α
I _{CM}	Pulsed Collector Current	$T_c = 25^{\circ}C$	630	
V _{GE}	Gate – Emitter Voltage		± 20	V
PD	Maximum Power Dissipation	$T_c = 25^{\circ}C$	833	W
RBSOA	Reverse Bias Safe Operating Area	$T_j = 150^{\circ}C$	400A @ 600V	

CAUTION: These Devices are sensitive to Electrostatic Discharge. Proper Handling Procedures Should Be Followed. See application note APT0502 on www.microsemi.com



All ratings (a) $T_j = 25^{\circ}C$ unless otherwise specified

Electrical Characteristics

Symbol	Characteristic	Test Conditions		Min	Тур	Max	Unit	
I	Zero Gate Voltage Collector Current	$V_{GE} = 0V$	$T_i = 25^{\circ}C$			300	μA	
I _{CES}	Zero Gate Voltage Collector Current	$V_{CE} = 600V$	$T_{i} = 125^{\circ}C$			1000	μΑ	
V _{CE(sat)}	Collector Emitter saturation Voltage	$V_{GE} = 15V$	$T_j = 25^{\circ}C$		2.0	2.5	V	
		$I_{\rm C} = 180 {\rm A}$	$T_{j} = 125^{\circ}C$		2.2		v	
V _{GE(th)}	Gate Threshold Voltage	$V_{GE} = V_{CE}, I_C = 2mA$		3		5	V	
I _{GES}	Gate – Emitter Leakage Current	$V_{GE} = 20 V, V_{CE} = 0V$				±200	nA	

Dynamic Characteristics

Symbol	Characteristic	Test Conditions		Min	Тур	Max	Unit
Cies	Input Capacitance	$V_{GE} = 0V$ $V_{CE} = 25V$ $f = 1MHz$			8.6		
C _{oes}	Output Capacitance				0.94		nF
C _{res}	Reverse Transfer Capacitance				0.8		
Qg	Total gate Charge	$V_{GS} = 15V$			660		nC
Q _{ge}	Gate – Emitter Charge	$V_{Bus} = 300V$			580		
Q _{gc}	Gate – Collector Charge	$I_{\rm C} = 180 {\rm A}$			400		
T _{d(on)}	Turn-on Delay Time	Inductive Switching (25°C)			26		
Tr	Rise Time	$V_{GE} = 15V$			25		
T _{d(off)}	Turn-off Delay Time	$V_{Bus} = 400V$ $I_{C} = 180A$ $R_{G} = 2.5 \Omega$			150		ns
T_{f}	Fall Time				30		
T _{d(on)}	Turn-on Delay Time	Inductive Switching (125°C) $V_{GE} = 15V$ $V_{Bus} = 400V$ $I_C = 180A$ $R_G = 2.5 \Omega$			26		ns
Tr	Rise Time				25		
T _{d(off)}	Turn-off Delay Time				170		
$T_{\rm f}$	Fall Time				40		
Eon	Turn-on Switching Energy	$V_{GE} = 15V$ $V_{Bus} = 400V$	$T_j = 125^{\circ}C$		8.6		
E _{off}	Turn-off Switching Energy	$I_{\rm C} = 180 \text{A}$ $R_{\rm G} = 2.5 \ \Omega$	$T_j = 125^{\circ}C$		7		mJ

Reverse diode ratings and characteristics

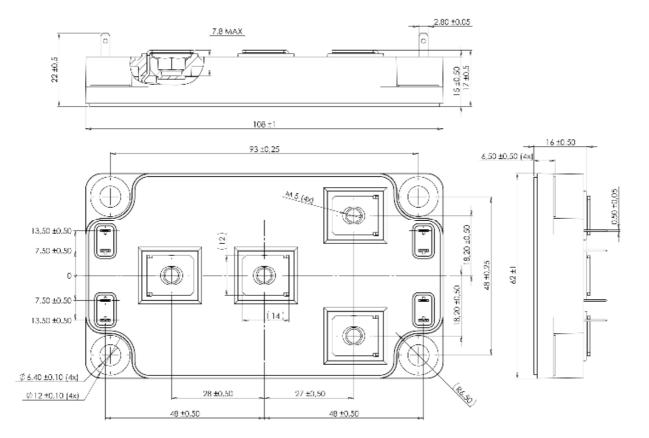
Symbol	Characteristic	Test Conditions		Min	Тур	Max	Unit
V _{RRM}	Maximum Peak Repetitive Reverse Voltage			600			V
т	Maximum Reverse Leakage Current	V _R =600V	$T_j = 25^{\circ}C$			350	μA
I _{RM}			$T_{j} = 125^{\circ}C$			750	μА
I _F	DC Forward Current		$T_c = 80^{\circ}C$		200		А
	Diode Forward Voltage	$I_{\rm F} = 200 {\rm A}$			1.6	1.8	
$V_{\rm F}$		$I_F = 400A$			1.9		V
		$I_{\rm F} = 200 {\rm A}$	$T_j = 125^{\circ}C$		1.4		
t _{rr}	Reverse Recovery Time	$I_{F} = 200A$ $V_{R} = 400V$ $di/dt = 400A/\mu s$	$T_j = 25^{\circ}C$		180		ns
			$T_{j} = 125^{\circ}C$		220		115
Q _{rr}	Reverse Recovery Charge		$T_j = 25^{\circ}C$		780		nC
			$T_j = 125^{\circ}C$		2900		ne



Thermal and package characteristics

Symbol	Characteristic			Min	Тур	Max	Unit
R _{thJC}	Junction to Case Thermal Resistance IGBT Diode				0.15	°C/W	
R _{th} JC			Diode			0.32	C/ W
V _{ISOL}	RMS Isolation Voltage, any terminal to case t =1 min, 50/60Hz			4000			V
T _J	Operating junction temperature range			-40		150	°C
T _{STG}	Storage Temperature Range			-40		125	
T _C	Operating Case Temperature			-40		100	
Torque	Mounting torque	To heatsink	M6	3		5	N.m
		For terminals	M5	2		3.5	19.111
Wt	Package Weight					300	g

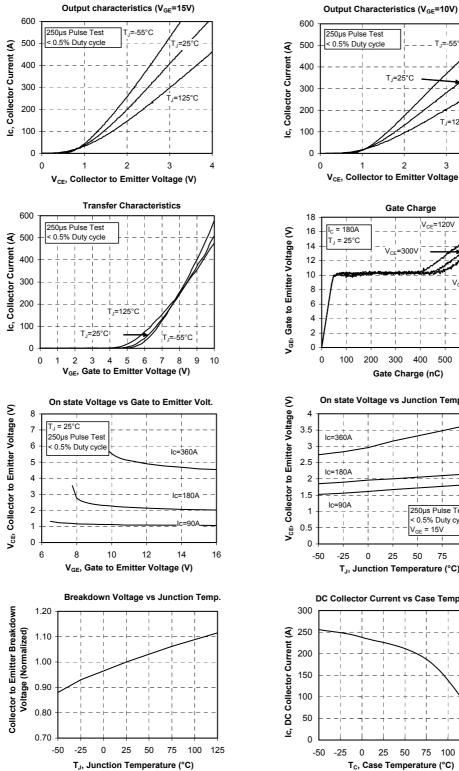
SP6 Package outline (dimensions in mm)

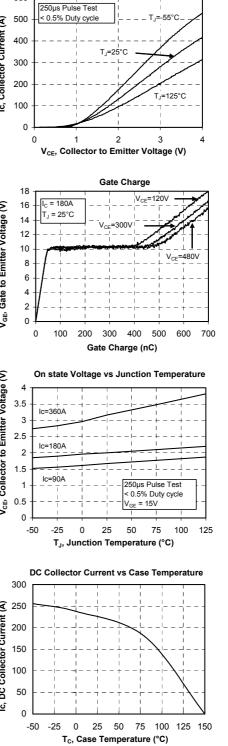


See application note APT0601 - Mounting Instructions for SP6 Power Modules on www.microsemi.com



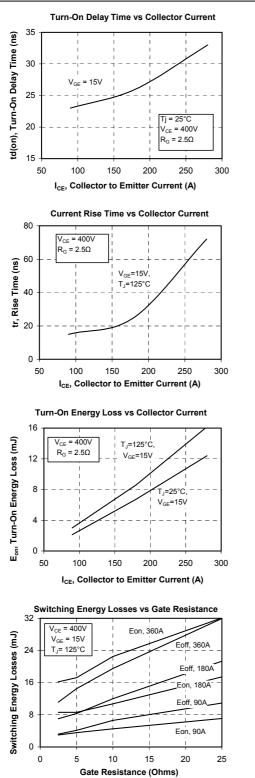
Typical Performance Curve

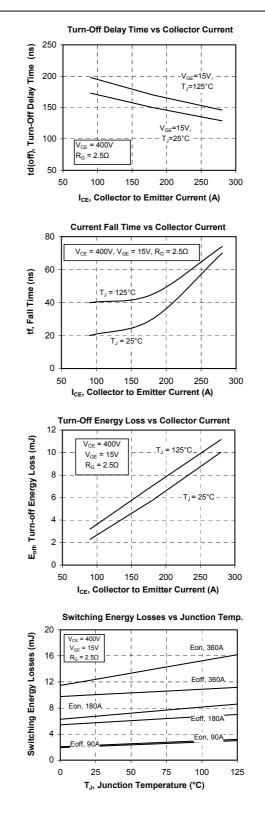




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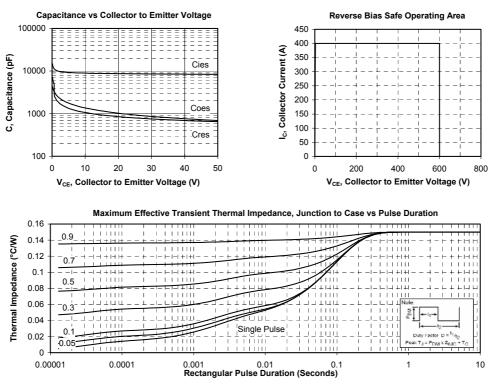


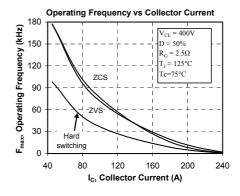




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