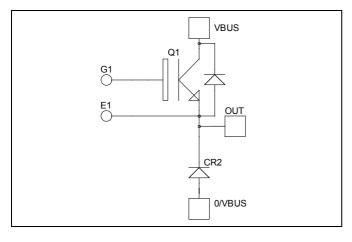
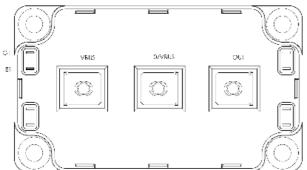


Buck chopper Trench + Field Stop IGBT3 Power Module





$$V_{CES} = 1700V$$

 $I_{C} = 225A$ @ $Tc = 80$ °C

Application

- AC and DC motor control
- Switched Mode Power Supplies

Features

- Trench + Field Stop IGBT3 Technology
 - Low voltage drop
 - Low tail current
 - Switching frequency up to 20 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

- 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		1700	V
$I_{\rm C}$	Continuous Collector Current	$T_C = 25$ °C	340	
	Continuous Conector Current	$T_C = 80$ °C	225	A
I_{CM}	Pulsed Collector Current	$T_C = 25$ °C	450	
V_{GE}	Gate – Emitter Voltage		±20	V
P_{D}	Maximum Power Dissipation	$T_C = 25$ °C	1250	W
RBSOA	Reverse Bias Safe Operating Area	$T_j = 125$ °C	450A @ 1600V	

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



All ratings @ $T_j = 25^{\circ}C$ unless otherwise specified

Electrical Characteristics

Symbol	Characteristic	Test Conditions		Min	Typ	Max	Unit
I_{CES}	Zero Gate Voltage Collector Current	$V_{GE} = 0V, V_{CE} = 1700V$				500	μΑ
V	Collector Emitter Saturation Voltage	$V_{GE} = 15V$	$T_j = 25^{\circ}C$		2.0	2.4	V
$V_{CE(sat)}$	Conector Emitter Saturation Voltage	$I_C = 225A$ $T_j =$	$T_j = 125$ °C		2.4		·
$V_{GE(th)}$	Gate Threshold Voltage	$V_{GE} = V_{CE}$, $I_C = 4mA$		5.0	5.8	6.5	V
I_{GES}	Gate – Emitter Leakage Current	$V_{GE} = 20V, V_{CE} = 0V$				600	nA

Dynamic Characteristics

Symbol	Characteristic	Test Conditions		Min	Typ	Max	Unit
Cies	Input Capacitance	$V_{GE} = 0V$ $V_{CE} = 25V$ $f = 1MHz$			20		
C_{oes}	Output Capacitance				0.8		nF
C_{res}	Reverse Transfer Capacitance				0.66		
$T_{d(on)}$	Turn-on Delay Time	Inductive Switching (25°C)			370		
T_{r}	Rise Time	$V_{GE} = 15V$			40		
$T_{d(off)}$	Turn-off Delay Time	$V_{Bus} = 900V$ $I_{C} = 225A$			650		ns
T_{f}	Fall Time	$R_G = 3.3\Omega$		180			
$T_{d(on)}$	Turn-on Delay Time	Inductive Switching (125°C) $V_{GE} = 15V$ $V_{Bus} = 900V$ $I_{C} = 225A$			400		ns
$T_{\rm r}$	Rise Time				50		
$T_{d(off)}$	Turn-off Delay Time				800		
T_{f}	Fall Time	$R_G = 3.3\Omega$			300		
Eon	Turn-on Switching Energy	$V_{GE} = 15V$ $V_{Bus} = 900V$	$T_j = 125$ °C		72		m I
$\mathrm{E}_{\mathrm{off}}$	Turn-off Switching Energy	$I_C = 225A$ $R_G = 3.3\Omega$	$T_j = 125$ °C		70.5		mJ

Chopper diode ratings and characteristics

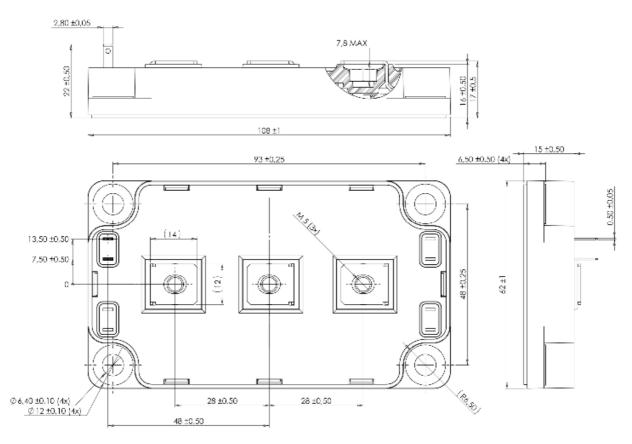
Symbol	Characteristic	Test Conditions		Min	Typ	Max	Unit
V_{RRM}	Maximum Peak Repetitive Reverse Voltage			1700			V
I_{RM}	Maximum Reverse Leakage Current	V _R =1700V	$T_j = 25$ °C			500	μА
*RM			$T_j = 125$ °C			750	μ21
I_F	DC Forward Current		Tc = 80°C		225		Α
$V_{\rm F}$	Diode Forward Voltage	$I_F = 225A$	$T_j = 25^{\circ}C$		1.8	2.2	V
V F	Blode I of ward Voltage		$T_{i} = 125^{\circ}C$		1.9		
t_{rr}	Reverse Recovery Time	$I_F = 225A$ $V_R = 900V$ $di/dt = 2400A/\mu s$	$T_j = 25$ °C		385		ns μC
чт			$T_j = 125$ °C		490		
0	Davianca Dagayany Changa		$T_j = 25^{\circ}C$		57		
Q_{rr}	Reverse Recovery Charge		$T_j = 125$ °C		93		μС
E_{r}	Reverse Recovery Energy		$T_j = 25^{\circ}C$		26		mJ
ı	Reverse Recovery Ellergy		$T_j = 125$ °C		52		1113



Thermal and package characteristics

Symbol	Characteristic			Min	Тур	Max	Unit		
R_{thJC}	Junction to Case Thermal Resistance IGBT Diode				0.1	°C/W			
			Diode			0.18	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	0		
T_{STG}	Storage Temperature Range			-40		125	°C		
$T_{\rm C}$	Operating Case Temperature			-40		100			
Torque	Mounting torque	To heatsink	M6	3		5	N.m		
		For terminals	M5	2		3.5			
Wt	Package Weight					300	g		

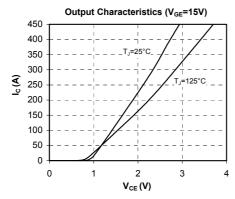
SP6 Package outline (dimensions in mm)

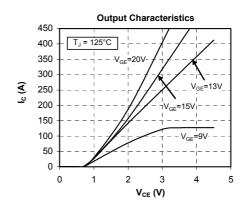


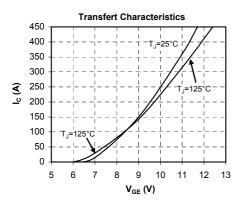
 $See \ application \ note \ APT0601 - Mounting \ Instructions \ for \ SP6 \ Power \ Modules \ on \ www.microsemi.com$

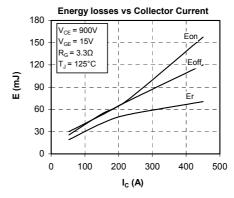


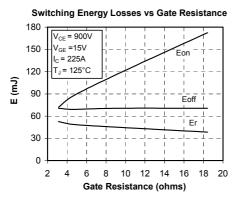
Typical Performance Curve

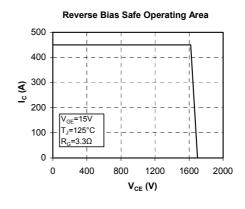


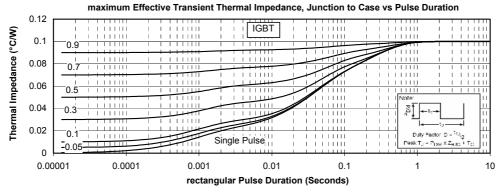




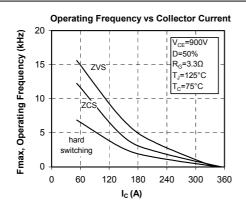


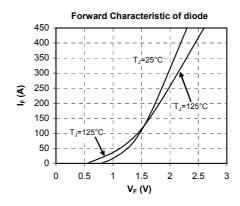


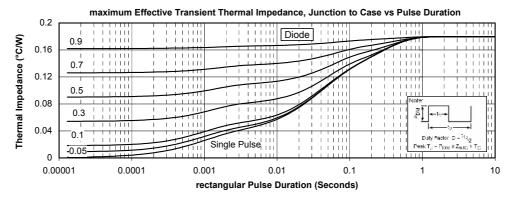














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