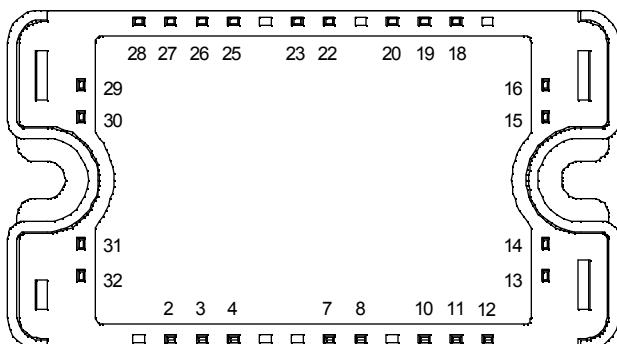
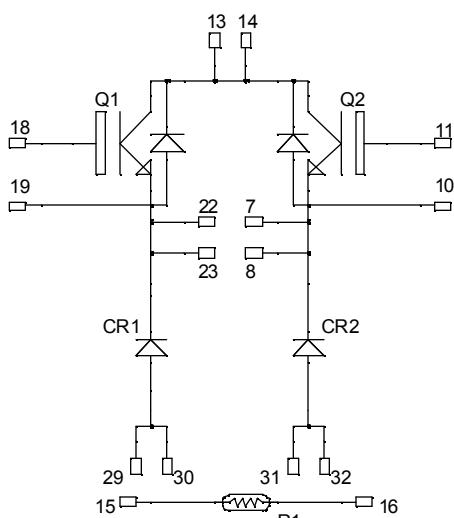


**Dual Buck chopper
Trench + Field Stop IGBT®
Power Module**

**V_{CES} = 600V
I_C = 100A* @ T_c = 80°C**



All multiple inputs and outputs must be shorted together
Example: 13/14 ; 29/30 ; 22/23 ...

Absolute maximum ratings

Symbol **Parameter**

Max ratings

Unit

V _{CES}	Collector - Emitter Breakdown Voltage	600	V
I _C	Continuous Collector Current	T _c = 25°C	150 *
		T _c = 80°C	100 *
I _{CM}	Pulsed Collector Current	T _c = 25°C	200
V _{GE}	Gate – Emitter Voltage		±20
P _D	Maximum Power Dissipation	T _c = 25°C	340
RBSOA	Reverse Bias Safe Operating Area	T _j = 150°C	200A @ 550V

* Specification of IGBT device but output current must be limited to 75A to not exceed a delta of temperature greater than 30°C for the connectors.

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

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

Electrical Characteristics

Symbol	Characteristic	Test Conditions		Min	Typ	Max	Unit
I_{CES}	Zero Gate Voltage Collector Current	$V_{GE} = 0\text{V}$, $V_{CE} = 600\text{V}$				250	μA
$V_{CE(\text{sat})}$	Collector Emitter Saturation Voltage	$V_{GE} = 15\text{V}$	$T_j = 25^\circ\text{C}$		1.5	1.9	V
		$I_C = 100\text{A}$	$T_j = 150^\circ\text{C}$		1.7		
$V_{GE(\text{th})}$	Gate Threshold Voltage	$V_{GE} = V_{CE}$, $I_C = 1.5 \text{ mA}$		5.0	5.8	6.5	V
I_{GES}	Gate – Emitter Leakage Current	$V_{GE} = 20\text{V}$, $V_{CE} = 0\text{V}$				400	nA

Dynamic Characteristics

Symbol	Characteristic	Test Conditions		Min	Typ	Max	Unit
C_{ies}	Input Capacitance	$V_{GE} = 0\text{V}$ $V_{CE} = 25\text{V}$ $f = 1\text{MHz}$		6100			pF
C_{oes}	Output Capacitance			390			
C_{res}	Reverse Transfer Capacitance			190			
$T_{d(on)}$	Turn-on Delay Time	$V_{GE} = \pm 15\text{V}$ $V_{Bus} = 300\text{V}$ $I_C = 100\text{A}$ $R_G = 3.3\Omega$		115			ns
T_r	Rise Time			45			
$T_{d(off)}$	Turn-off Delay Time			225			
T_f	Fall Time			55			
$T_{d(on)}$	Turn-on Delay Time	$V_{GE} = \pm 15\text{V}$ $V_{Bus} = 300\text{V}$ $I_C = 100\text{A}$ $R_G = 3.3\Omega$		130			ns
T_r	Rise Time			50			
$T_{d(off)}$	Turn-off Delay Time			300			
T_f	Fall Time			70			
E_{on}	Turn on Energy	$V_{GE} = \pm 15\text{V}$ $V_{Bus} = 300\text{V}$ $I_C = 100\text{A}$ $R_G = 3.3\Omega$	$T_j = 25^\circ\text{C}$	0.4			mJ
			$T_j = 150^\circ\text{C}$	0.875			
E_{off}	Turn off Energy		$T_j = 25^\circ\text{C}$	2.5			mJ
			$T_j = 150^\circ\text{C}$	3.5			

Chopper diode ratings and characteristics

Symbol	Characteristic	Test Conditions		Min	Typ	Max	Unit
V_{RRM}	Maximum Peak Repetitive Reverse Voltage			600			V
I_{RM}	Maximum Reverse Leakage Current	$V_R = 600\text{V}$	$T_j = 25^\circ\text{C}$			250	μA
			$T_j = 150^\circ\text{C}$			500	
I_F	DC Forward Current		$T_c = 80^\circ\text{C}$		100		A
V_F	Diode Forward Voltage	$I_F = 100\text{A}$ $V_{GE} = 0\text{V}$	$T_j = 25^\circ\text{C}$		1.6	2	V
			$T_j = 150^\circ\text{C}$		1.5		
t_{rr}	Reverse Recovery Time		$T_j = 25^\circ\text{C}$		125		ns
			$T_j = 150^\circ\text{C}$		220		
Q_{rr}	Reverse Recovery Charge	$I_F = 100\text{A}$ $V_R = 300\text{V}$ $di/dt = 2000\text{A}/\mu\text{s}$	$T_j = 25^\circ\text{C}$		4.7		μC
			$T_j = 150^\circ\text{C}$		9.9		
E_r	Reverse Recovery Energy		$T_j = 25^\circ\text{C}$		1.1		mJ
			$T_j = 150^\circ\text{C}$		2.4		

Temperature sensor NTC (see application note APT0406 on www.microsemi.com for more information).

Symbol **Characteristic**
Min **Typ** **Max** **Unit**

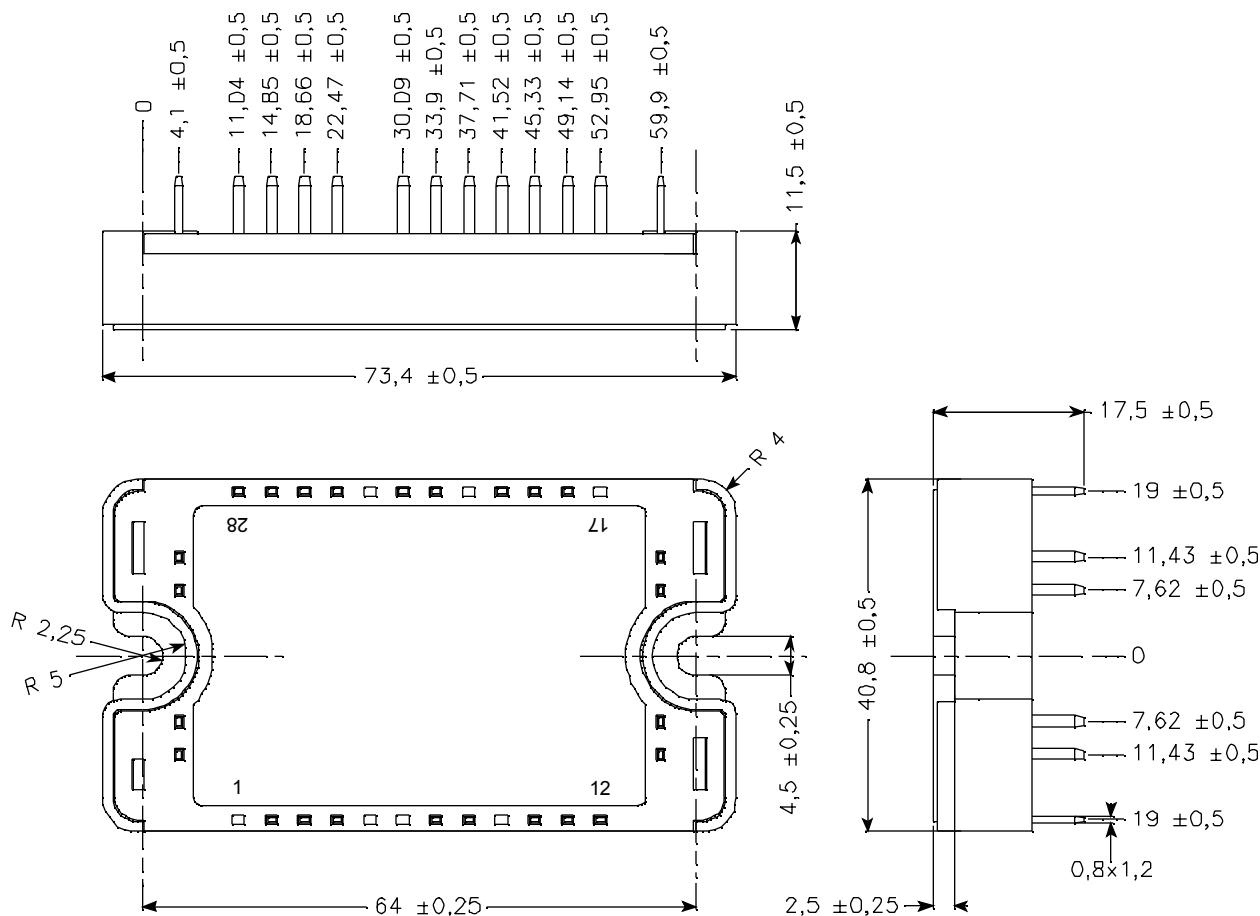
R ₂₅	Resistance @ 25°C		50		kΩ
B _{25/85}	T ₂₅ = 298.15 K		3952		K

$$R_T = \frac{R_{25}}{\exp\left[B_{25/85}\left(\frac{1}{T_{25}} - \frac{1}{T}\right)\right]}$$

T: Thermistor temperature
R_T: Thermistor value at T

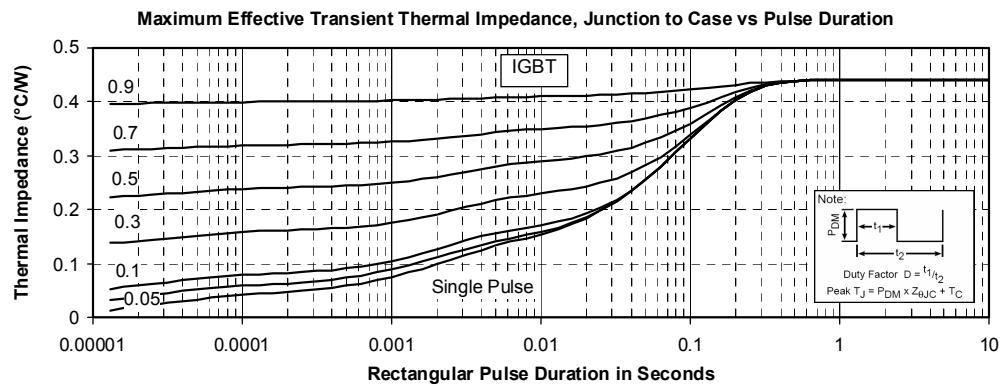
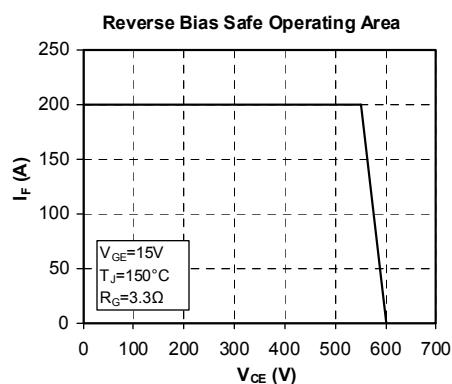
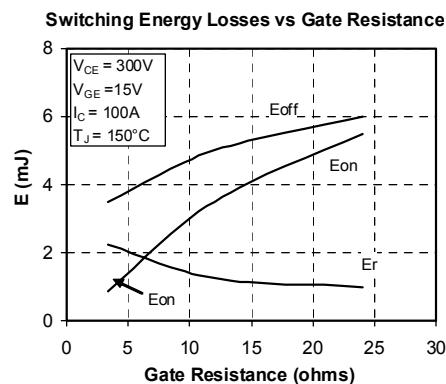
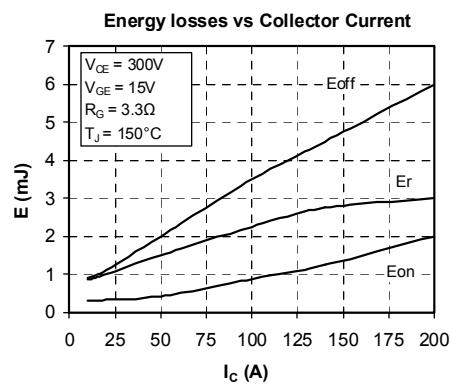
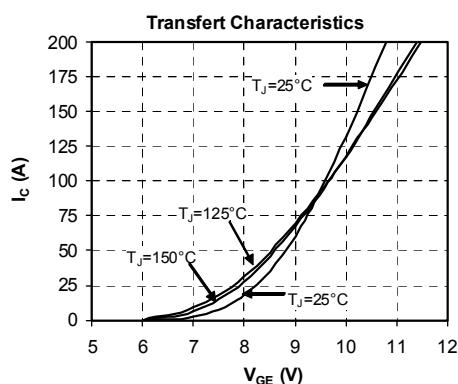
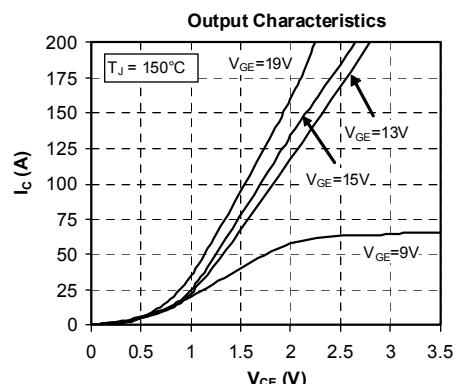
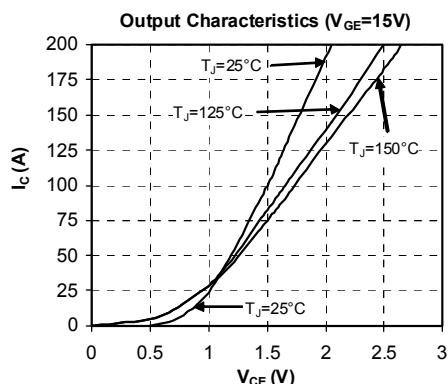
Thermal and package characteristics
Symbol **Characteristic**
Min **Typ** **Max** **Unit**

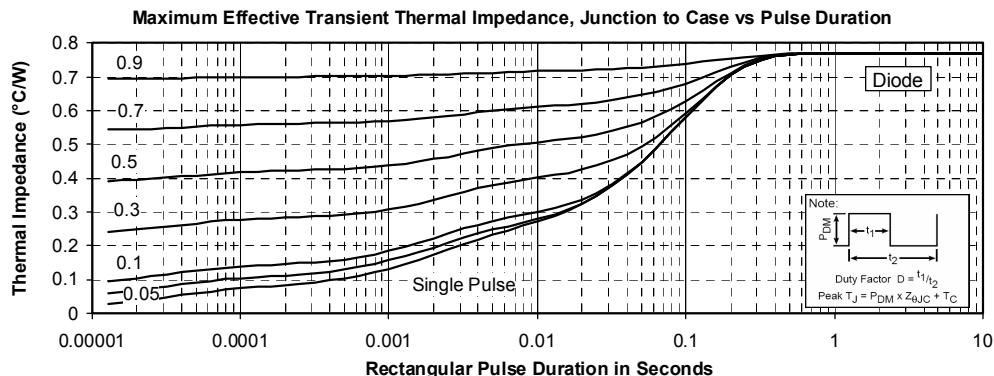
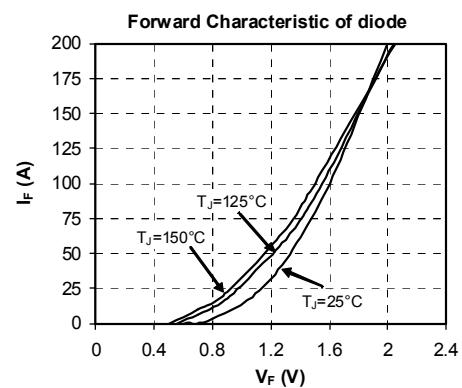
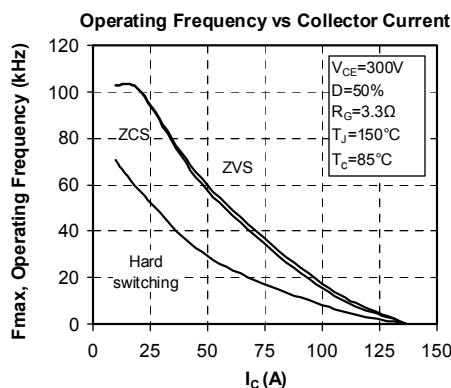
R _{thJC}	Junction to Case Thermal Resistance	IGBT		0.44	°C/W	
		Diode		0.77		
V _{ISOL}	RMS Isolation Voltage, any terminal to case t = 1 min, I isol < 1mA, 50/60Hz	2500			V	
T _J	Operating junction temperature range	-40		175		
T _{STG}	Storage Temperature Range	-40		125	°C	
T _C	Operating Case Temperature	-40		100		
Torque	Mounting torque	To heatsink	M4	2.5	4.7	N.m
Wt	Package Weight			110	g	

SP3 Package outline (dimensions in mm)

 See application note 1901 - Mounting Instructions for SP3 Power Modules on www.microsemi.com



Typical Performance Curve





Microsemi reserves the right to change, without notice, the specifications and information contained herein

Microsemi's products are covered by one or more of U.S patents 4,895,810 5,045,903 5,089,434 5,182,234 5,019,522 5,262,336 6,503,786 5,256,583 4,748,103 5,283,202 5,231,474 5,434,095 5,528,058 and foreign patents pending. All Rights Reserved.