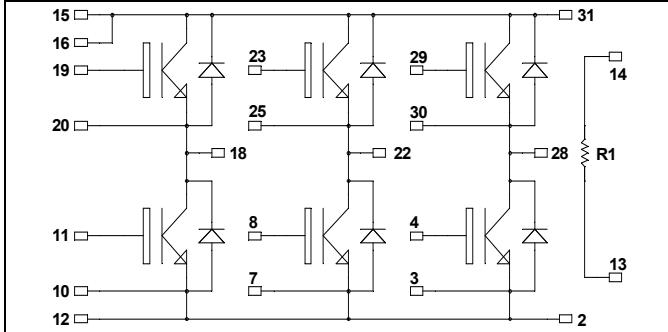
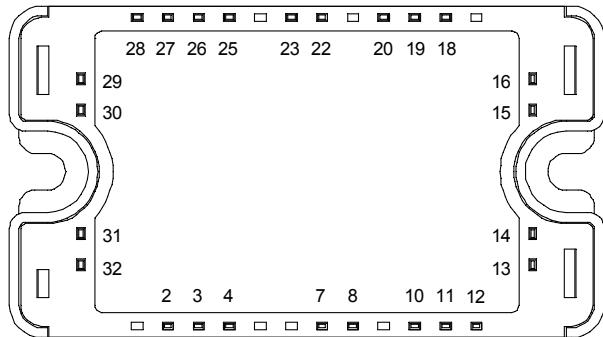


**3 Phase bridge
Trench + Field Stop IGBT3
Power Module**

**V_{CES} = 600V
I_C = 50A* @ T_c = 80°C**



It is recommended to connect a decoupling capacitor between pins 31 & 2 to reduce switching overvoltages, if DC Power is connected between pins 15, 16 & 12.
Pins 15 & 16 must be shorted together.



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	A
		T _c = 80°C	
I _{CM}	Pulsed Collector Current	T _c = 25°C	100
V _{GE}	Gate – Emitter Voltage	±20	V
P _D	Maximum Power Dissipation	T _c = 25°C	176
RBSOA	Reverse Bias Safe Operating Area	T _j = 150°C	100A @ 550V

* Specification of IGBT device but output current must be limited to 40A at T_c=80°C and 65A at T_c=25°C not to exceed a connectors temperature greater than 120°C.

 **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
		$I_C = 50\text{A}$	$T_j = 150^\circ\text{C}$		1.7		
$V_{GE(\text{th})}$	Gate Threshold Voltage	$V_{GE} = V_{CE}$, $I_C = 600\mu\text{A}$		5.0	5.8	6.5	V
I_{GES}	Gate – Emitter Leakage Current	$V_{GE} = 20\text{V}$, $V_{CE} = 0\text{V}$				600	nA

Dynamic Characteristics

Symbol	Characteristic	Test Conditions		Min	Typ	Max	Unit
C_{ies}	Input Capacitance	$V_{GE} = 0\text{V}$ $V_{CE} = 25\text{V}$ $f = 1\text{MHz}$		3150			pF
C_{oes}	Output Capacitance			200			
C_{res}	Reverse Transfer Capacitance			95			
$T_{d(on)}$	Turn-on Delay Time	$V_{GE} = \pm 15\text{V}$ $V_{Bus} = 300\text{V}$ $I_C = 50\text{A}$ $R_G = 8.2\Omega$	Inductive Switching (25°C)	110			ns
T_r	Rise Time			45			
$T_{d(off)}$	Turn-off Delay Time			200			
T_f	Fall Time			40			
$T_{d(on)}$	Turn-on Delay Time	$V_{GE} = \pm 15\text{V}$ $V_{Bus} = 300\text{V}$ $I_C = 50\text{A}$ $R_G = 8.2\Omega$	Inductive Switching (150°C)	120			ns
T_r	Rise Time			50			
$T_{d(off)}$	Turn-off Delay Time			250			
T_f	Fall Time			60			
E_{on}	Turn-on Switching Energy	$V_{GE} = \pm 15\text{V}$ $V_{Bus} = 300\text{V}$ $I_C = 50\text{A}$	$T_j = 25^\circ\text{C}$	0.3			mJ
			$T_j = 150^\circ\text{C}$	0.43			
E_{off}	Turn-off Switching Energy	$I_C = 50\text{A}$ $R_G = 8.2\Omega$	$T_j = 25^\circ\text{C}$	1.35			mJ
			$T_j = 150^\circ\text{C}$	1.75			

Reverse diode ratings and characteristics

Symbol	Characteristic	Test Conditions		Min	Typ	Max	Unit	
V_{RRM}	Maximum Peak Repetitive Reverse Voltage	$V_R = 600\text{V}$		600			V	
I_{RM}	Maximum Reverse Leakage Current		$T_j = 25^\circ\text{C}$			250	μA	
			$T_j = 150^\circ\text{C}$			500		
I_F	DC Forward Current		$T_c = 80^\circ\text{C}$		50		A	
V_F	Diode Forward Voltage	$I_F = 50\text{A}$ $V_{GE} = 0\text{V}$	$T_j = 25^\circ\text{C}$		1.6	2	V	
			$T_j = 150^\circ\text{C}$		1.5			
t_{rr}	Reverse Recovery Time	$I_F = 50\text{A}$ $V_R = 300\text{V}$ $di/dt = 1800\text{A}/\mu\text{s}$	$T_j = 25^\circ\text{C}$		100		ns	
			$T_j = 150^\circ\text{C}$		150			
Q_{rr}	Reverse Recovery Charge		$T_j = 25^\circ\text{C}$		2.6		μC	
			$T_j = 150^\circ\text{C}$		5.4			
E_r	Reverse Recovery Energy		$T_j = 25^\circ\text{C}$		0.6		mJ	
			$T_j = 150^\circ\text{C}$		1.2			

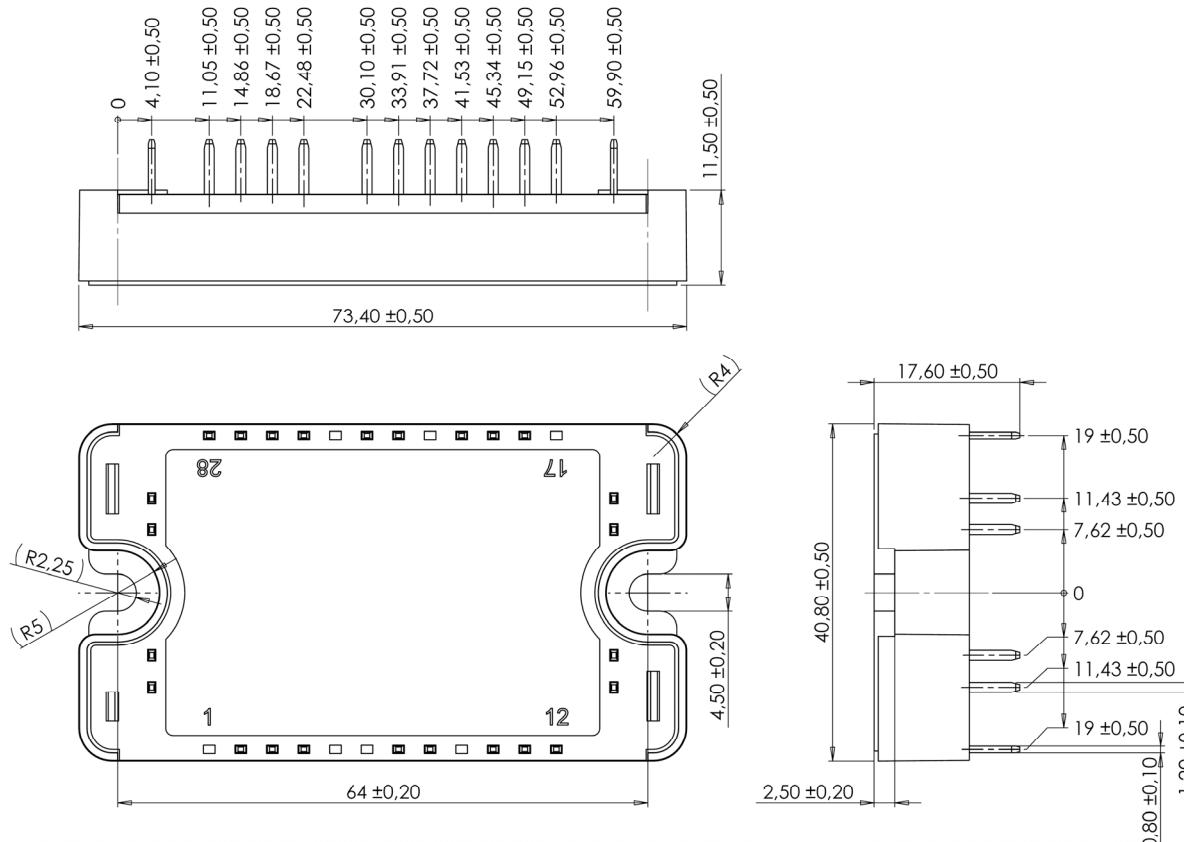
Temperature sensor NTC (see application note APT0406 on www.microsemi.com for more information).

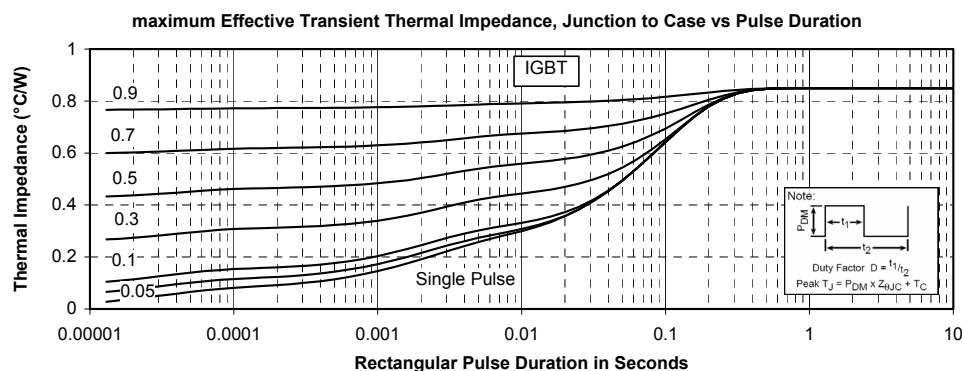
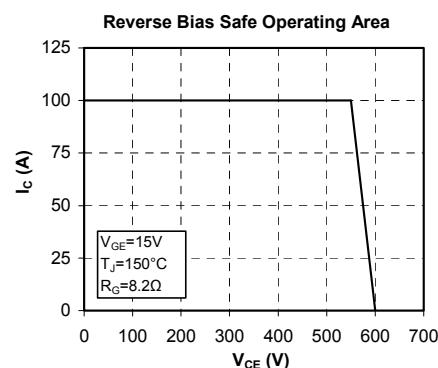
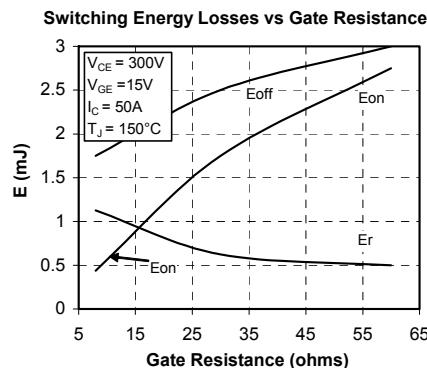
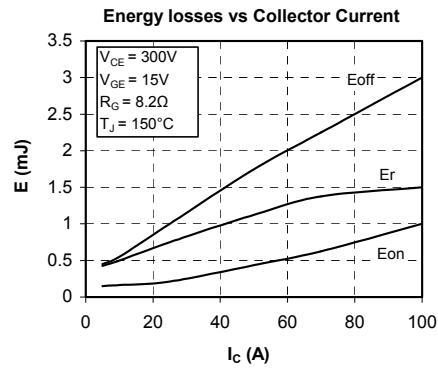
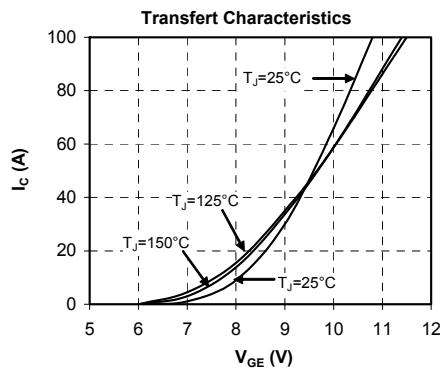
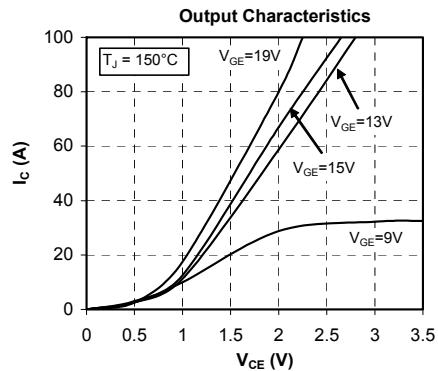
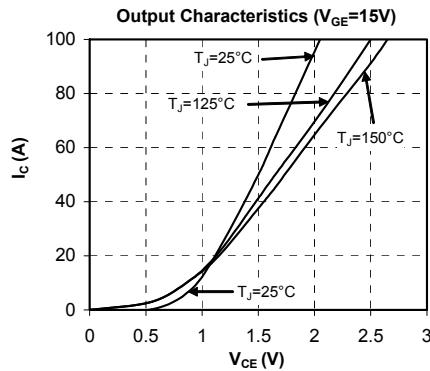
Symbol	Characteristic	Min	Typ	Max	Unit
R ₂₅	Resistance @ 25°C		50		kΩ
B _{25/85}	T ₂₅ = 298.15 K		3952		K

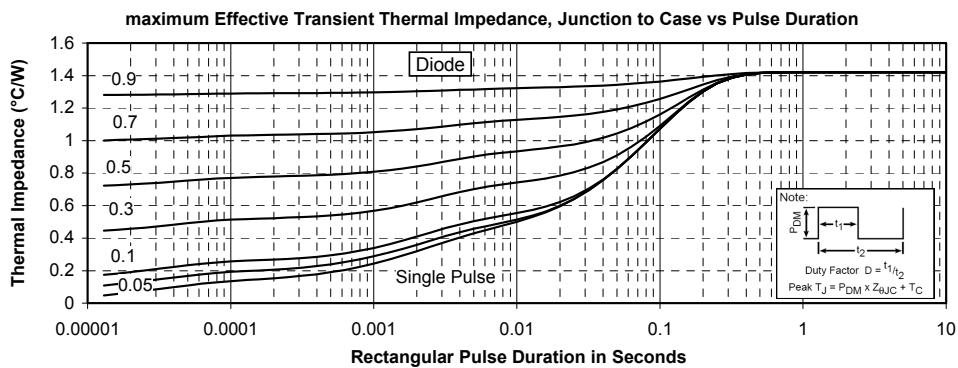
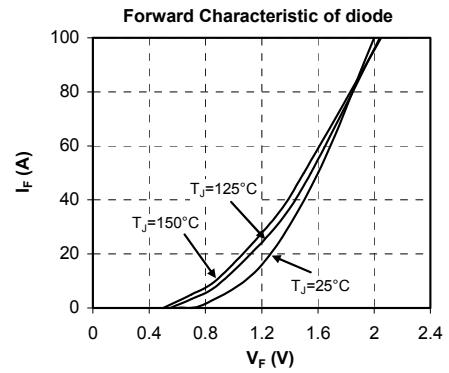
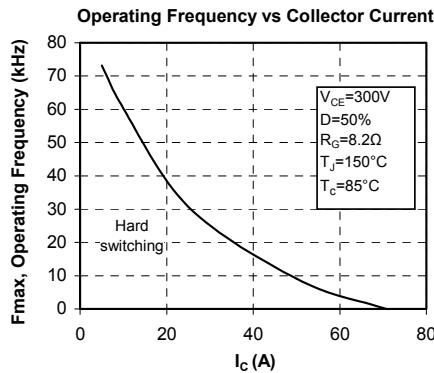
$$R_T = \frac{R_{25}}{\exp\left[B_{25/85}\left(\frac{1}{T_{25}} - \frac{1}{T}\right)\right]} \quad \begin{array}{l} T: \text{Thermistor temperature} \\ R_T: \text{Thermistor value at } T \end{array}$$

Thermal and package characteristics

Symbol	Characteristic	Min	Typ	Max	Unit
R _{thJC}	Junction to Case Thermal Resistance			0.85	°C/W
				1.42	
V _{ISOL}	RMS Isolation Voltage, any terminal to case t = 1 min, 50/60Hz	4000			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	3 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




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