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With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

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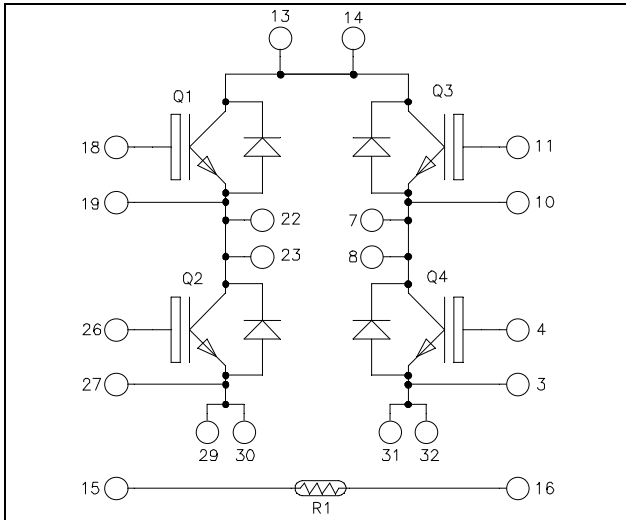
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**Full bridge
Trench + Field Stop IGBT4
Power module**

**$V_{CES} = 1200V$
 $I_C = 60A @ T_c = 80^\circ C$**


Application

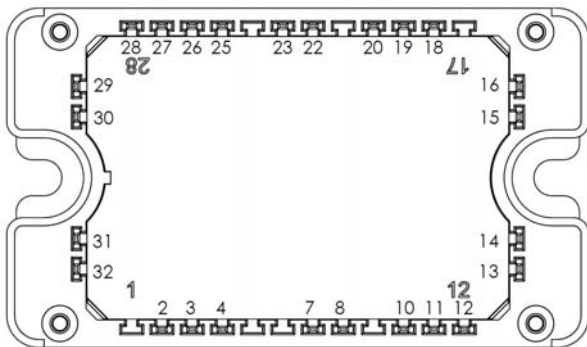
- Welding converters
- Switched Mode Power Supplies
- Uninterruptible Power Supplies
- Motor control

Features

- **Trench + Field Stop IGBT 4**
 - Low voltage drop
 - Low leakage current
 - Low switching losses
 - Low leakage current
 - RBSOA and SCSOA rated
- Kelvin emitter for easy drive
- Very low stray inductance
- Internal thermistor for temperature monitoring

Benefits

- Outstanding performance at high frequency operation
- Direct mounting to heatsink (isolated package)
- Low junction to case thermal resistance
- Solderable terminals both for power and signal for easy PCB mounting
- Low profile
- Easy paralleling due to positive TC of V_{CEsat}
- Each leg can be easily paralleled to achieve a phase leg of twice the current capability
- RoHS compliant



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

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

Absolute maximum ratings (per IGBT)

Symbol	Parameter	Max ratings	Unit
V_{CES}	Collector - Emitter Voltage	1200	V
I_C	Continuous Collector Current	$T_c = 25^\circ C$	80
		$T_c = 80^\circ C$	60
I_{CM}	Pulsed Collector Current	$T_c = 25^\circ C$	100
V_{GE}	Gate - Emitter Voltage	± 20	V
P_D	Power Dissipation	$T_c = 25^\circ C$	280
RBSOA	Reverse Bias Safe Operating Area	$T_j = 150^\circ C$	100A @ 1100V

CAUTION: These Devices are sensitive to Electrostatic Discharge. Proper Handling Procedures Should Be Followed.

Electrical Characteristics (per IGBT)

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
I _{CEs}	Zero Gate Voltage Collector Current	V _{GE} = 0V, V _{CE} = 1200V			250	μA
V _{CE(sat)}	Collector Emitter saturation Voltage	V _{GE} = 15V I _C = 50A		1.85 2.25	2.25	V
V _{GE(th)}	Gate Threshold Voltage	V _{GE} = V _{CE} , I _C = 1.6mA	5.0	5.8	6.5	V
I _{GES}	Gate – Emitter Leakage Current	V _{GE} = 20V, V _{CE} = 0V			400	nA

Dynamic Characteristics (per IGBT)

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
C _{ies}	Input Capacitance	V _{GE} = 0V		2770		pF
C _{oes}	Output Capacitance	V _{CE} = 25V		205		
C _{res}	Reverse Transfer Capacitance	f = 1MHz		160		
Q _G	Gate charge	V _{GE} = ±15V ; V _{CE} = 600V I _C = 50A		0.38		μC
T _{d(on)}	Turn-on Delay Time	Inductive Switching (25°C) V _{GE} = ±15V V _{CE} = 600V I _C = 50A R _G = 8.2Ω		130		ns
T _r	Rise Time			20		
T _{d(off)}	Turn-off Delay Time			300		
T _f	Fall Time			45		
T _{d(on)}	Turn-on Delay Time	Inductive Switching (150°C) V _{GE} = ±15V V _{CE} = 600V I _C = 50A R _G = 8.2Ω		150		ns
T _r	Rise Time			35		
T _{d(off)}	Turn-off Delay Time			350		
T _f	Fall Time			80		
E _{on}	Turn-on Switching Energy	V _{GE} = ±15V V _{CE} = 600V I _C = 50A R _G = 8.2Ω	T _J = 25°C	3.8		mJ
			T _J = 150°C	5.5		
E _{off}	Turn-off Switching Energy	I _C = 50A R _G = 8.2Ω	T _J = 25°C	2.5		mJ
			T _J = 150°C	4.5		
I _{sc}	Short Circuit data	V _{GE} ≤ 15V ; V _{Bus} = 900V t _p ≤ 10μs ; T _J = 150°C		200		A
R _{thJC}	Junction to Case Thermal Resistance				0.53	°C/W

Reverse diode ratings and characteristics (per diode)

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
V _{RRM}	Peak Repetitive Reverse Voltage				1200	V
I _{RM}	Reverse Leakage Current	V _R = 1200V			100	μA
I _F	DC Forward Current	T _c = 80°C		60		A
V _F	Diode Forward Voltage	I _F = 60A		2.5	3	V
		I _F = 120A		3		
		I _F = 60A T _J = 125°C		1.8		
t _{rr}	Reverse Recovery Time	I _F = 60A V _R = 800V di/dt = 200A/μs	T _J = 25°C	265		ns
			T _J = 125°C	350		
Q _{rr}	Reverse Recovery Charge	di/dt = 200A/μs	T _J = 25°C	560		nC
			T _J = 125°C	2890		
R _{thJC}	Junction to Case Thermal Resistance				0.9	°C/W

Thermal and package characteristics

Symbol	Characteristic	Min	Max	Unit		
V _{ISOL}	RMS Isolation Voltage, any terminal to case t=1 min, 50/60Hz	4000		V		
T _J	Operating junction temperature range	-40	175	°C		
T _{JOP}	Recommended junction temperature under switching conditions	-40	T _{Jmax} -25			
T _{STG}	Storage Temperature Range	-40	125			
T _C	Operating Case Temperature	-40	125			
Torque	Mounting torque	To heatsink	M4	2	3	N.m
Wt	Package Weight				110	g

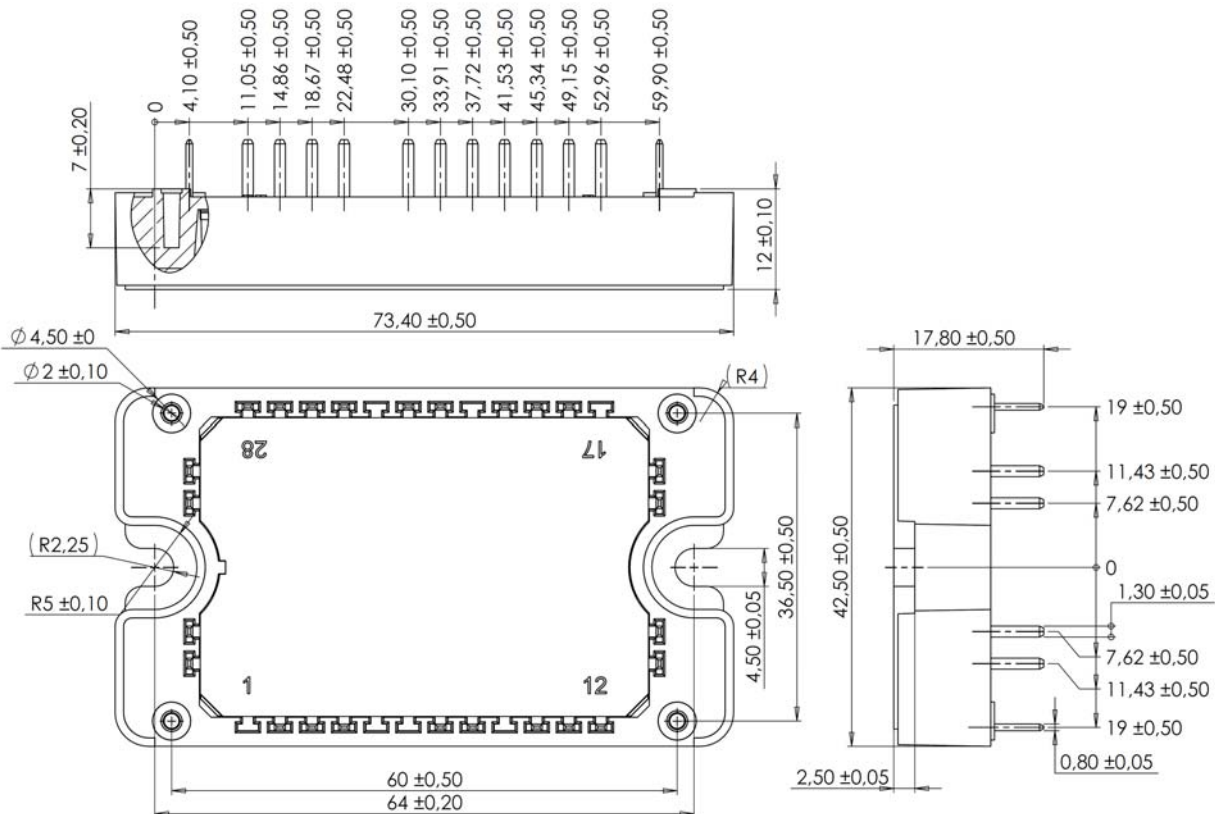
Temperature sensor NTC (see application note APT0406 on www.microsemi.com for more information).

Symbol	Characteristic	Min	Typ	Max	Unit
R ₂₅	Resistance @ 25°C		50		kΩ
ΔR ₂₅ /R ₂₅			5		%
B _{25/85}	T ₂₅ = 298.15 K		3952		K
ΔB/B				4	%

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

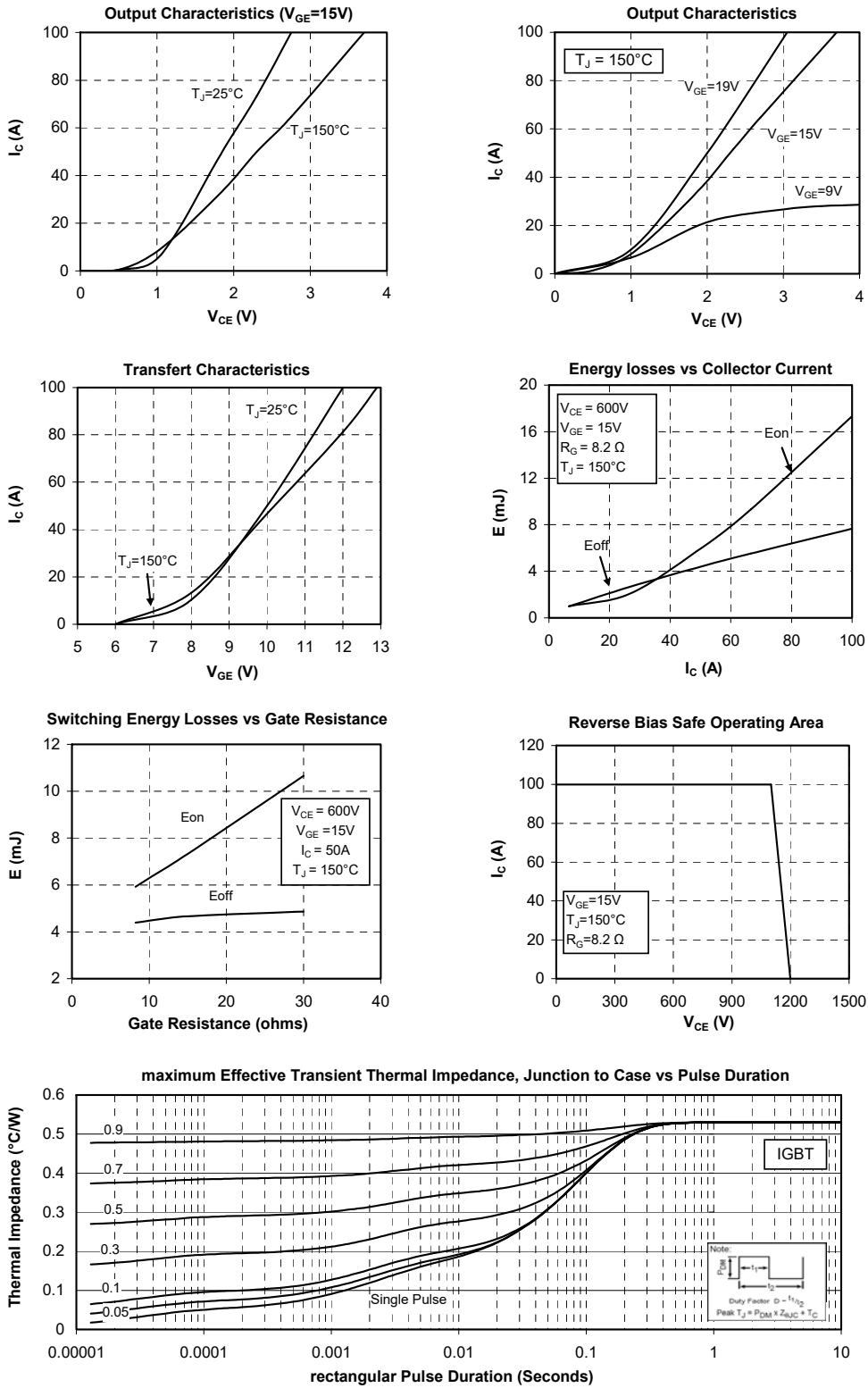
T: Thermistor temperature
 R_T: Thermistor value at T

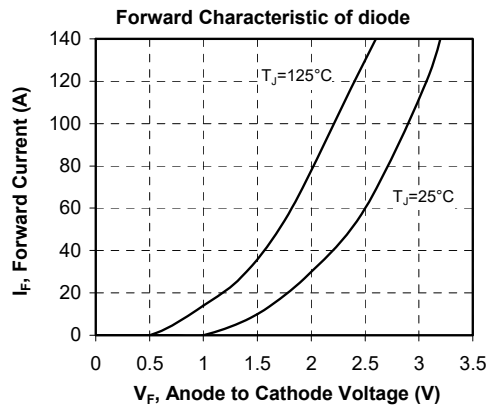
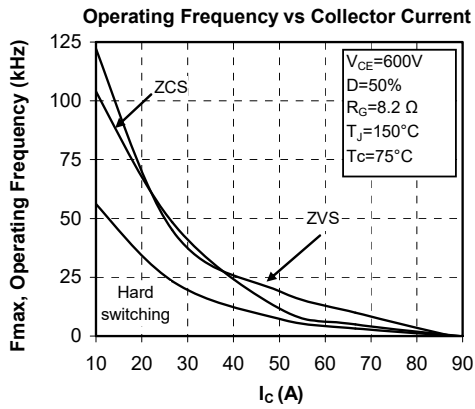
Package outline (dimensions in mm)



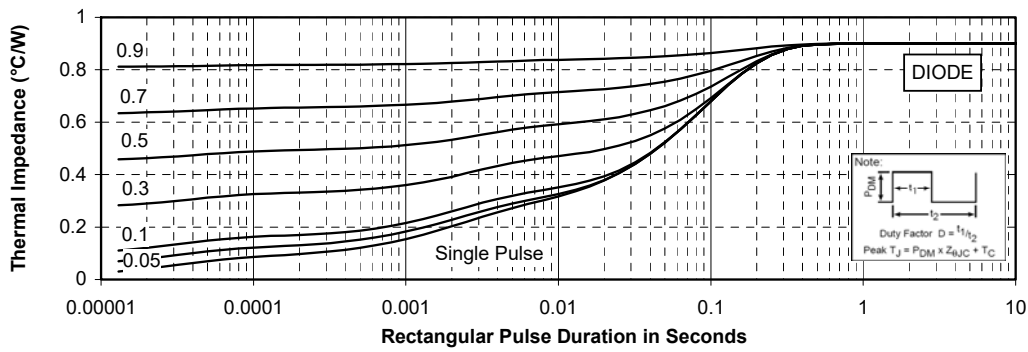
See application note 1906 - Mounting Instructions for SP3F Power Modules on www.microsemi.com

Typical Performance Curve





maximum Effective Transient Thermal Impedance, Junction to Case vs Pulse Duration



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