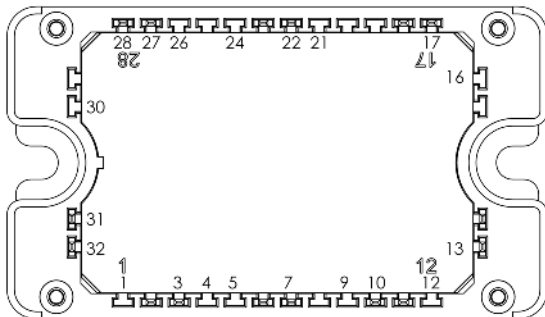
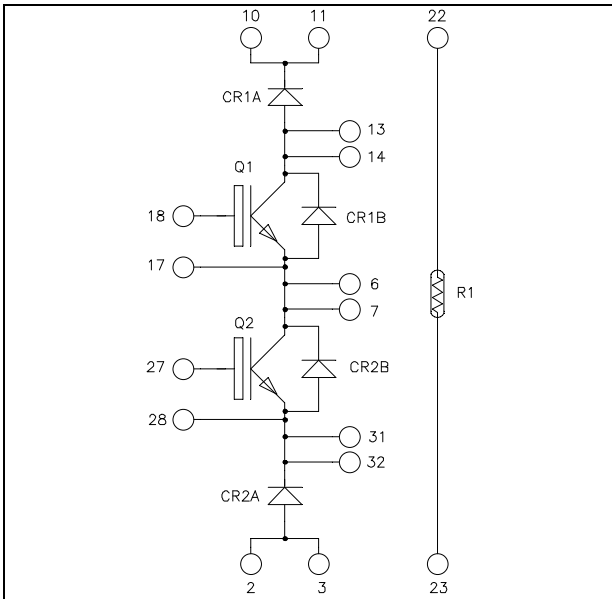


**Boost buck chopper
Trench + Field Stop IGBT3
Power Module**

**$V_{CES} = 600V$
 $I_C = 100A^* @ T_c = 80^\circ C$**



All multiple inputs and outputs must be shorted together
 Example: 10/11 ; 13/14 ; 6/7 ...

Application

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

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
- Very low stray inductance
- Kelvin emitter for easy drive
- Internal thermistor for temperature monitoring
- High level of integration

Benefits

- 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
- RoHS Compliant

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

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

Absolute maximum ratings (Per IGBT)

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	V
P _D	Maximum Power Dissipation	T _C = 25°C	340
RBSOA	Reverse Bias Safe Operating Area	T _J = 150°C	200A @ 550V

* Specification of device but output current must be limited due to size of output pins.

Electrical Characteristics (Per IGBT)

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
I _{CES}	Zero Gate Voltage Collector Current	V _{GE} = 0V, V _{CE} = 600V			250	μA
V _{CE(sat)}	Collector Emitter Saturation Voltage	V _{GE} = 15V I _C = 100A	T _J = 25°C	1.5	1.9	V
			T _J = 150°C		1.7	
V _{GE(th)}	Gate Threshold Voltage	V _{GE} = V _{CE} , I _C = 1.5 mA	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 V _{CE} = 25V f = 1MHz		6100		pF
C _{oes}	Output Capacitance			390		
C _{res}	Reverse Transfer Capacitance			190		
Q _G	Gate charge	V _{GE} = ±15V ; V _{CE} = 300V I _C = 100A		1.1		μC
T _{d(on)}	Turn-on Delay Time	Inductive Switching (25°C) V _{GE} = ±15V V _{Bus} = 300V I _C = 100A R _G = 3.3Ω		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	Inductive Switching (150°C) V _{GE} = ±15V V _{Bus} = 300V I _C = 100A R _G = 3.3Ω		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} = ±15V V _{Bus} = 300V I _C = 100A	T _J = 25°C	0.4		mJ
			T _J = 150°C	0.875		
E _{off}	Turn off Energy	R _G = 3.3Ω	T _J = 25°C	2.5		mJ
			T _J = 150°C	3.5		
I _{sc}	Short Circuit data	V _{GE} ≤ 15V ; V _{Bus} = 360V t _p ≤ 6μs ; T _J = 150°C		500		A

Reverse diode ratings and characteristics (Per diode)

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 =600V			150	μA
					400	
I _F	DC Forward Current			100		A
V _F	Diode Forward Voltage	I _F = 100A V _{GE} = 0V		1.6	2	V
				1.5		
t _{rr}	Reverse Recovery Time			100		ns
				150		
Q _{rr}	Reverse Recovery Charge	I _F = 100A V _R = 300V di/dt = 2500A/μs		5.1		μC
				10.7		
E _r	Reverse Recovery Energy			1.2		mJ
				2.4		

Thermal and package characteristics

Symbol	Characteristic	Min	Typ	Max	Unit	
R _{thJC}	Junction to Case Thermal Resistance	Per IGBT		0.44	°C/W	
		Per Diode		0.77		
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 _{STG}	Storage Temperature Range	-40		125		
T _C	Operating Case Temperature	-40		100		
Torque	Mounting torque	To heatsink	M4	2	3	N.m
Wt	Package Weight				110	g

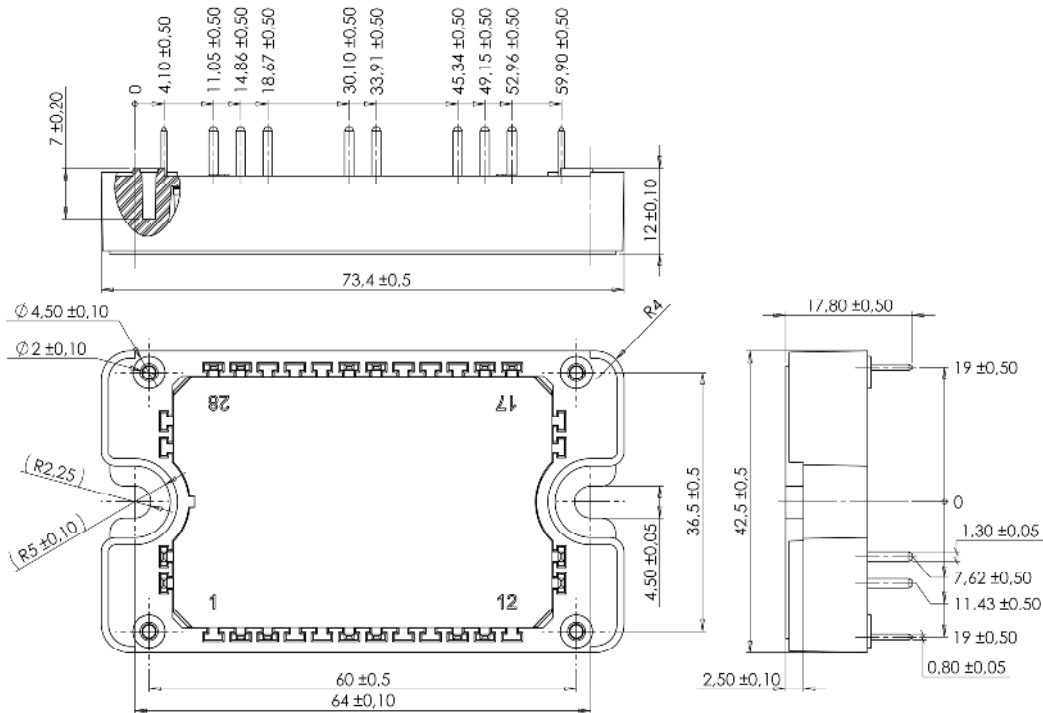
Temperature sensor NTC

Symbol	Characteristic	Min	Typ	Max	Unit
R ₂₅	Resistance @ 25°C		22		kΩ
ΔR ₂₅ /R ₂₅	Resistance tolerance			5	%
ΔB/B	Beta tolerance			3	
B _{25/100}	T ₂₅ = 298.16 K		3980		K

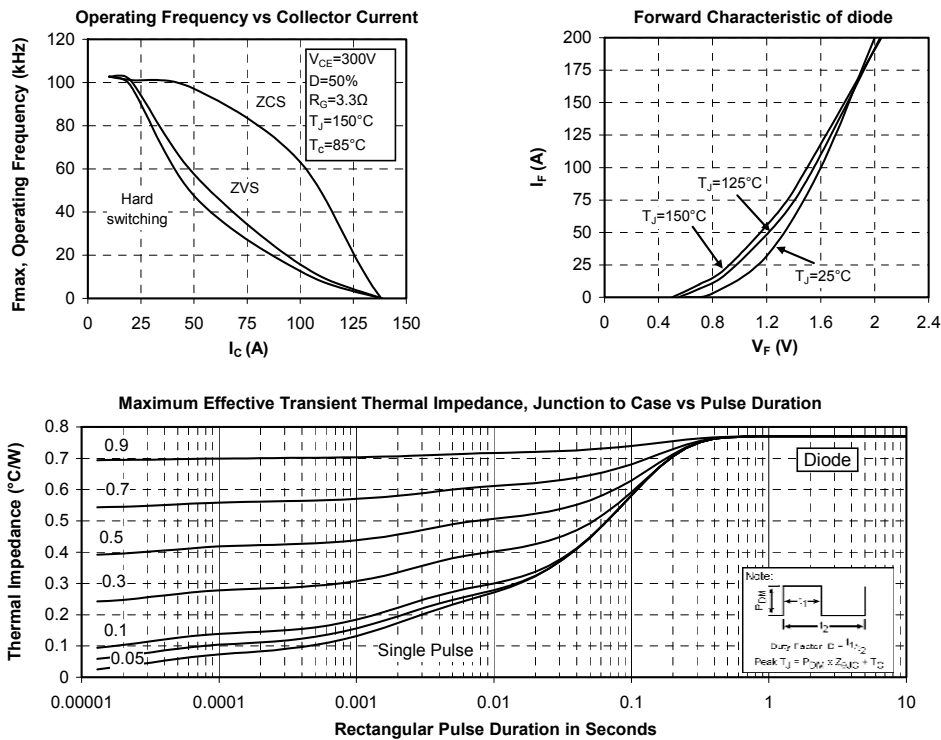
$$R_T = \frac{R_{25}}{\exp \left[B_{25/100} \left(\frac{1}{T_{25}} - \frac{1}{T} \right) \right]}$$

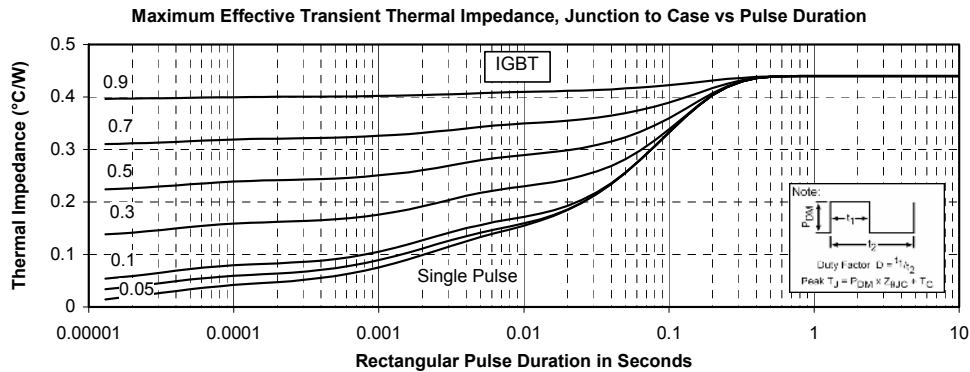
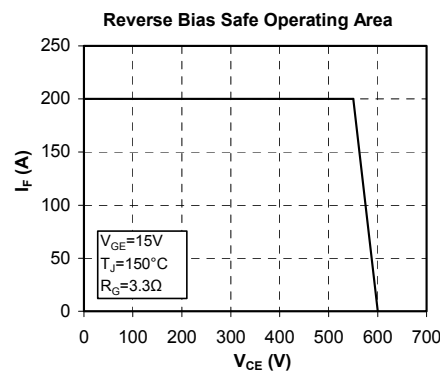
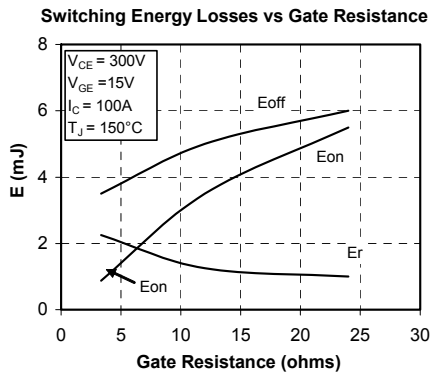
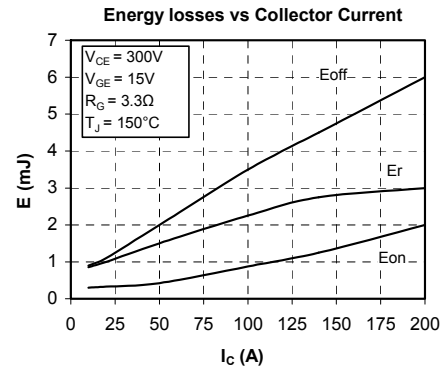
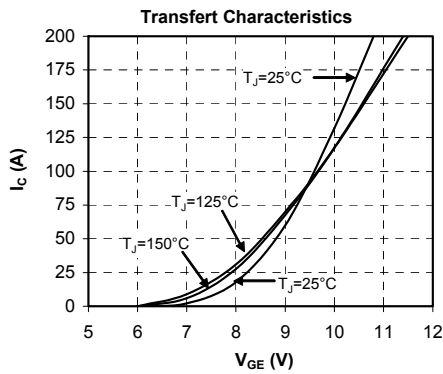
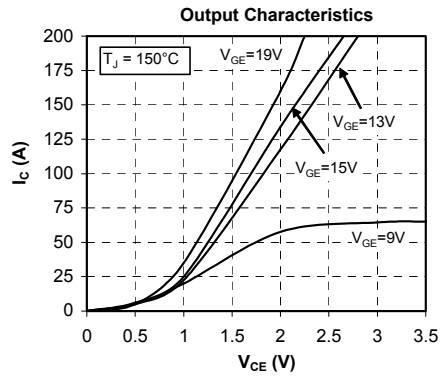
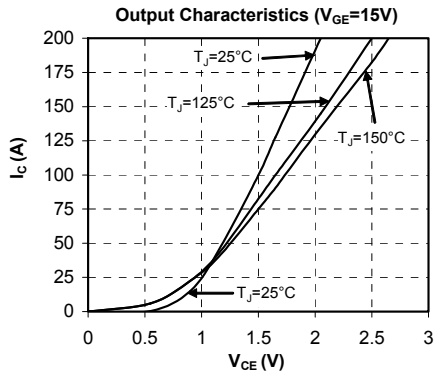
T: Thermistor temperature
 R_T: Thermistor value at T

SP3F Package outline (dimensions in mm)



Typical Performance Curve





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