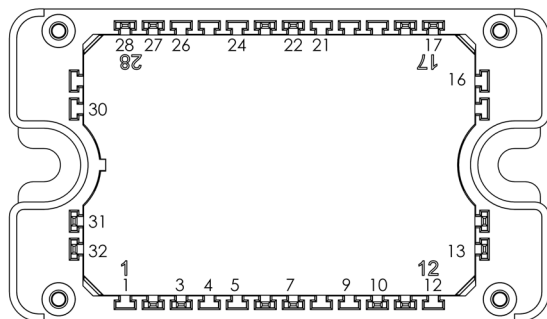
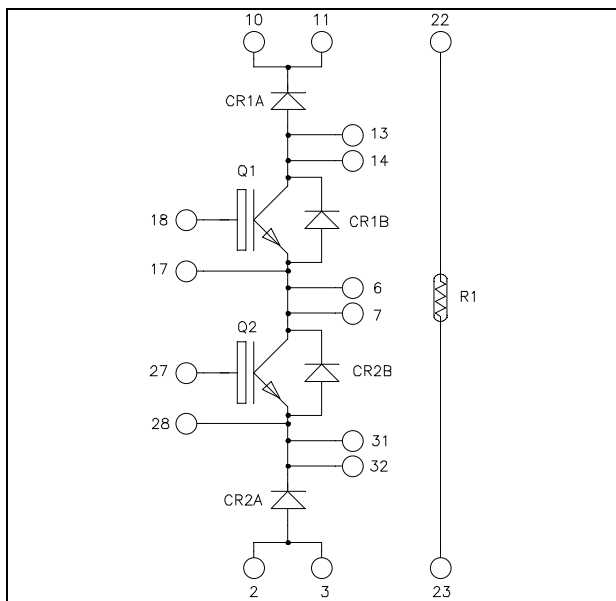


***Boost buck chopper
Trench + Field Stop IGBT3
Power Module***

$$V_{CES} = 600V$$

$$I_C = 100A^* @ T_c = 80^{\circ}C$$



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	$T_C = 25^\circ\text{C}$ 150* $T_C = 80^\circ\text{C}$ 100*	A
I_{CM}	Pulsed Collector Current	$T_C = 25^\circ\text{C}$ 200	
V_{GE}	Gate – Emitter Voltage	± 20	V
P_D	Maximum Power Dissipation	$T_C = 25^\circ\text{C}$ 340	W
RBSOA	Reverse Bias Safe Operating Area	$T_j = 150^\circ\text{C}$ 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	$V_{GE} = 15V$ $I_C = 100A$ $T_j = 25^\circ\text{C}$ $T_j = 150^\circ\text{C}$		1.5 1.7	1.9	V
$V_{GE(th)}$	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	$V_{GE} = 20V, V_{CE} = 0V$			400	nA

Dynamic Characteristics (Per IGBT)

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
C_{ies}	Input Capacitance	$V_{GE} = 0V$		6100		pF
C_{oes}	Output Capacitance	$V_{CE} = 25V$		390		
C_{res}	Reverse Transfer Capacitance	$f = 1\text{MHz}$		190		
Q_G	Gate charge	$V_{GE} = \pm 15V; V_{CE} = 300V$ $I_C = 100A$		1.1		μC
$T_{d(on)}$	Turn-on Delay Time	Inductive Switching (25°C) $V_{GE} = \pm 15V$ $V_{Bus} = 300V$ $I_C = 100A$ $R_G = 3.3\Omega$		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	Inductive Switching (150°C) $V_{GE} = \pm 15V$ $V_{Bus} = 300V$ $I_C = 100A$ $R_G = 3.3\Omega$		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	$V_{GE} = \pm 15V$ $V_{Bus} = 300V$ $I_C = 100A$ $R_G = 3.3\Omega$ $T_j = 25^\circ\text{C}$ $T_j = 150^\circ\text{C}$		0.4 0.875		mJ
E_{off}	Turn off Energy	$T_j = 25^\circ\text{C}$ $T_j = 150^\circ\text{C}$		2.5 3.5		
I_{sc}	Short Circuit data	$V_{GE} \leq 15V; V_{Bus} = 360V$ $t_p \leq 6\mu\text{s}; T_j = 150^\circ\text{C}$		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	T _j = 25°C T _j = 150°C			150 400	μA
I _F	DC Forward Current		T _c = 80°C		100		A
V _F	Diode Forward Voltage	I _F = 100A V _{GE} = 0V	T _j = 25°C T _j = 150°C		1.6 1.5	2	V
t _{rr}	Reverse Recovery Time	I _F = 100A V _R = 300V di/dt = 2500A/μs	T _j = 25°C T _j = 150°C		100 150		ns
Q _{rr}	Reverse Recovery Charge		T _j = 25°C T _j = 150°C		5.1 10.7		μC
E _r	Reverse Recovery Energy		T _j = 25°C T _j = 150°C		1.2 2.4		mJ

Thermal and package characteristics

Symbol	Characteristic	Test Conditions		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

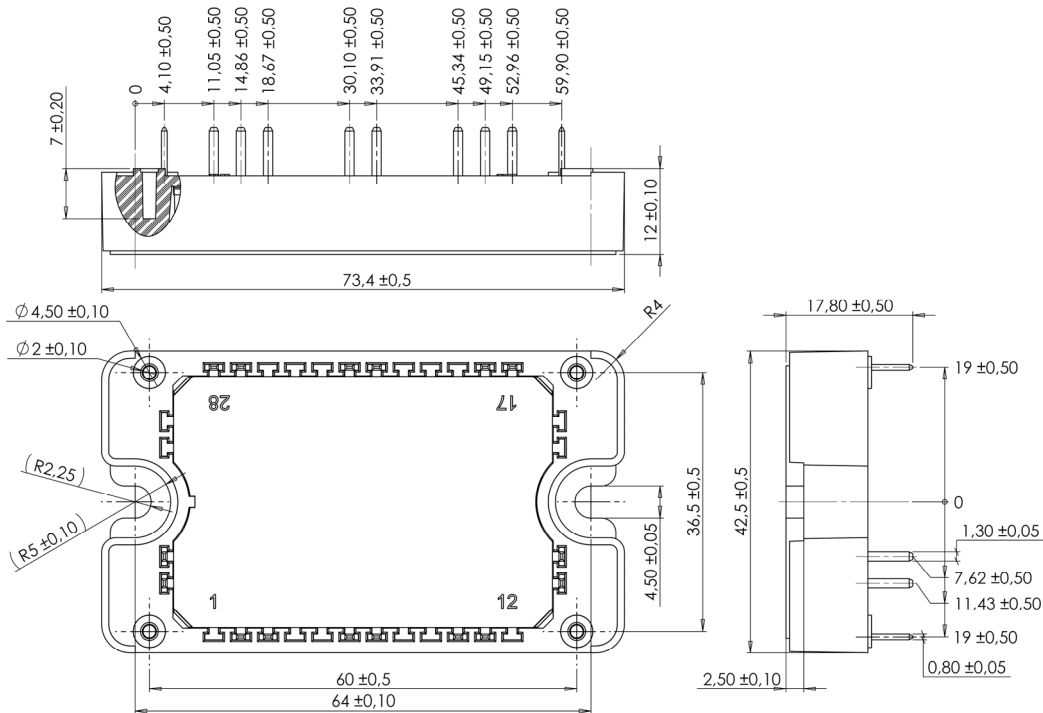
Temperature sensor NTC

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

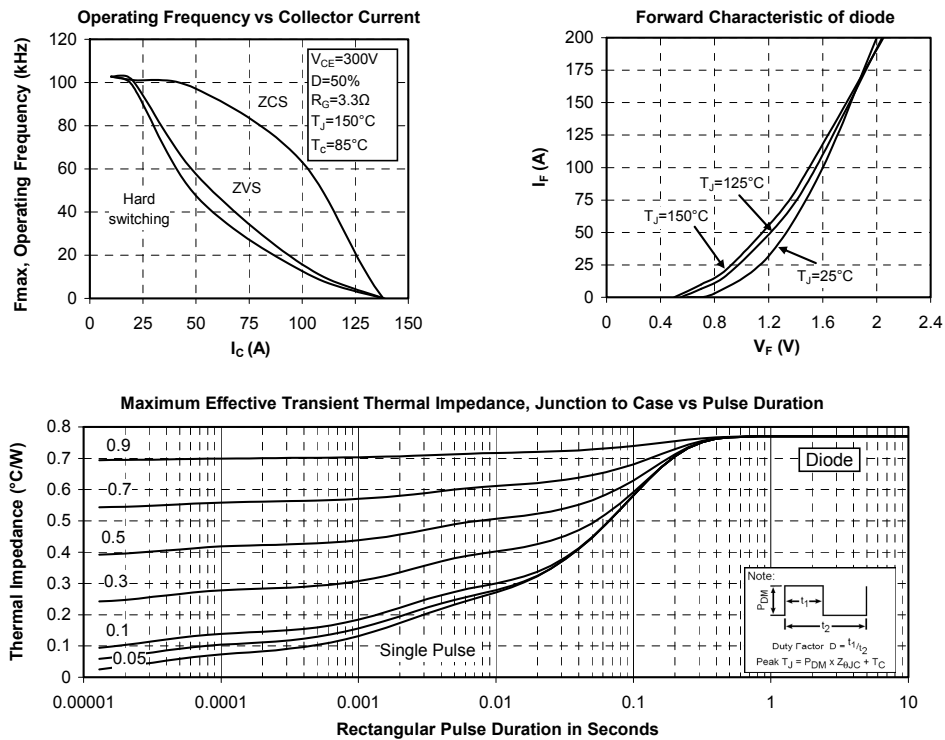
$$R_T = \frac{R_{25}}{\exp \left[B_{25/100} \left(\frac{1}{T_{25}} - \frac{1}{T} \right) \right]}$$

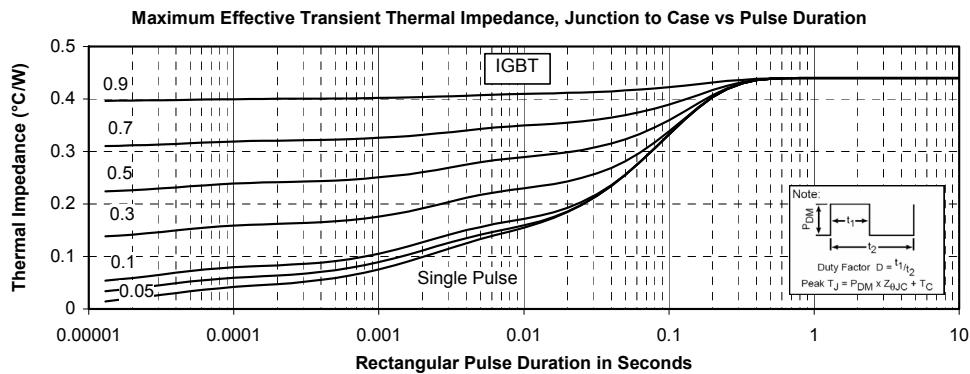
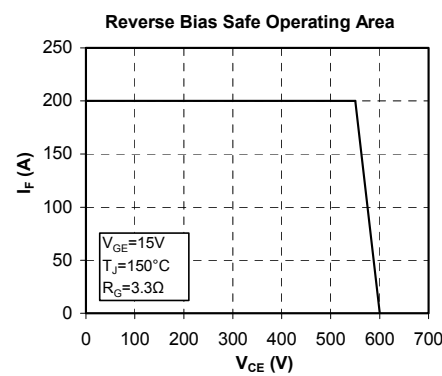
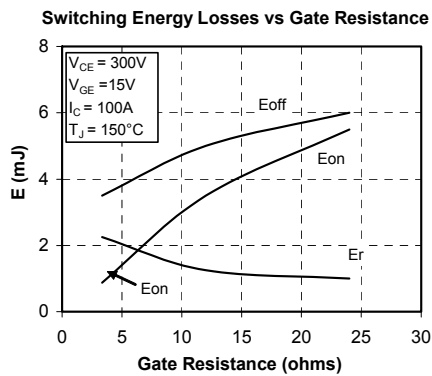
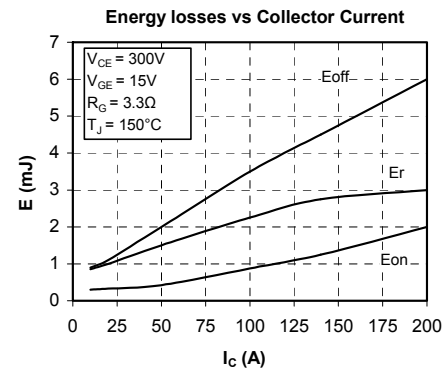
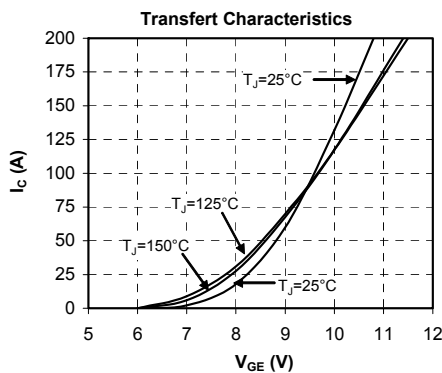
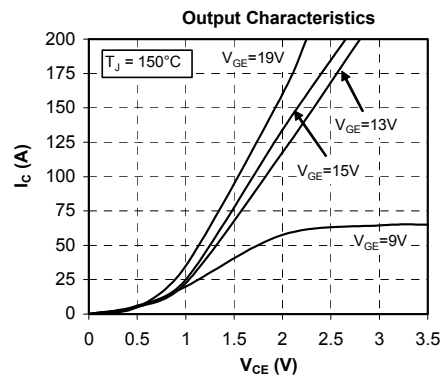
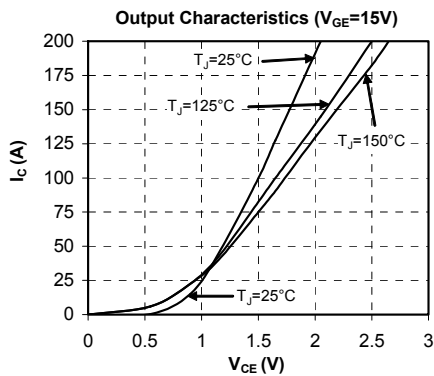
T: Thermistor temperature
R_T: Thermistor value at T

SP3F Package outline (dimensions in mm)



Typical Performance Curve





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