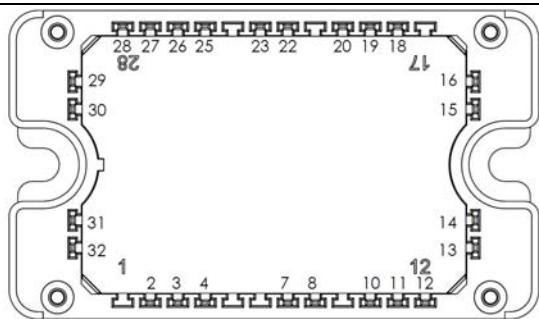
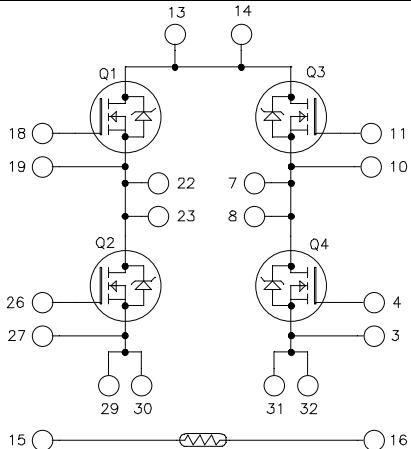


**Full - Bridge
MOSFET Power Module**
 $V_{DSS} = 100V$
 $R_{DSon} = 19m\Omega$ typ @ $T_j = 25^\circ C$
 $I_D = 70A$ @ $T_c = 25^\circ C$


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

Application

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

Features

- **Power MOS V® FREDFETs**
 - Low R_{DSon}
 - Low input and Miller capacitance
 - Low gate charge
 - Fast intrinsic diode
 - Avalanche energy rated
 - Very rugged
- Kelvin source 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
- Each leg can be easily paralleled to achieve a phase leg of twice the current capability
- RoHS Compliant

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

Absolute maximum ratings (per MOSFET)

Symbol	Parameter	Max ratings	Unit
V_{DSS}	Drain - Source Voltage	100	V
I_D	Continuous Drain Current	$T_c = 25^\circ C$	70
		$T_c = 80^\circ C$	50
I_{DM}	Pulsed Drain current	300	
V_{GS}	Gate - Source Voltage	± 30	V
R_{DSon}	Drain - Source ON Resistance	21	$m\Omega$
P_D	Power Dissipation	$T_c = 25^\circ C$	208
I_{AR}	Avalanche current (repetitive and non repetitive)	75	A
E_{AR}	Repetitive Avalanche Energy	30	
E_{AS}	Single Pulse Avalanche Energy	1500	mJ

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

Electrical Characteristics (per MOSFET)

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
I _{DSS}	Zero Gate Voltage Drain Current	V _{GS} = 0V, V _{DS} = 100V			250	µA
R _{D(on)}	Drain – Source on Resistance	V _{GS} = 10V, I _D = 35A		19	21	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{GS} = V _{DS} , I _D = 1mA	2		4	V
I _{GSS}	Gate – Source Leakage Current	V _{GS} = ±30 V, V _{DS} = 0V			±150	nA

Dynamic Characteristics (per MOSFET)

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
C _{iss}	Input Capacitance	V _{GS} = 0V V _{DS} = 25V f = 1MHz		5100		pF
C _{oss}	Output Capacitance			1900		
C _{rss}	Reverse Transfer Capacitance			800		
Q _g	Total gate Charge	V _{GS} = 10V V _{Bus} = 100V I _D = 70A		200		nC
Q _{gs}	Gate – Source Charge			40		
Q _{gd}	Gate – Drain Charge			92		
T _{d(on)}	Turn-on Delay Time	Inductive switching @ 125°C V _{GS} = 15V V _{Bus} = 66V I _D = 70A R _G = 5Ω		35		ns
T _r	Rise Time			70		
T _{d(off)}	Turn-off Delay Time			95		
T _f	Fall Time			125		
E _{on}	Turn-on Switching Energy	Inductive switching @ 25°C V _{GS} = 15V, V _{Bus} = 66V I _D = 70A, R _G = 5Ω		276		µJ
E _{off}	Turn-off Switching Energy			302		
E _{on}	Turn-on Switching Energy	Inductive switching @ 125°C V _{GS} = 15V, V _{Bus} = 66V I _D = 70A, R _G = 5Ω		304		µJ
E _{off}	Turn-off Switching Energy			320		
R _{thJC}	Junction to Case Thermal Resistance				0.6	°C/W

Source - Drain diode ratings and characteristics (per MOSFET)

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
I _S	Continuous Source current (Body diode)		T _c = 25°C		70	A
			T _c = 80°C		50	
V _{SD}	Diode Forward Voltage	V _{GS} = 0V, I _S = - 70A			1.3	V
dv/dt	Peak Diode Recovery ①				5	V/ns
t _{rr}	Reverse Recovery Time	I _S = -70A V _{Bus} = 66V dI _S /dt = 100A/µs	T _j = 25°C		200	ns
			T _j = 125°C		350	
Q _{rr}	Reverse Recovery Charge	I _S = -70A V _{Bus} = 66V dI _S /dt = 100A/µs	T _j = 25°C	0.5		µC
			T _j = 125°C	1		

① dv/dt numbers reflect the limitations of the circuit rather than the device itself.

 I_S ≤ - 70A di/dt ≤ 700A/µs V_R ≤ V_{DSS} T_j ≤ 150°C

Thermal and package characteristics

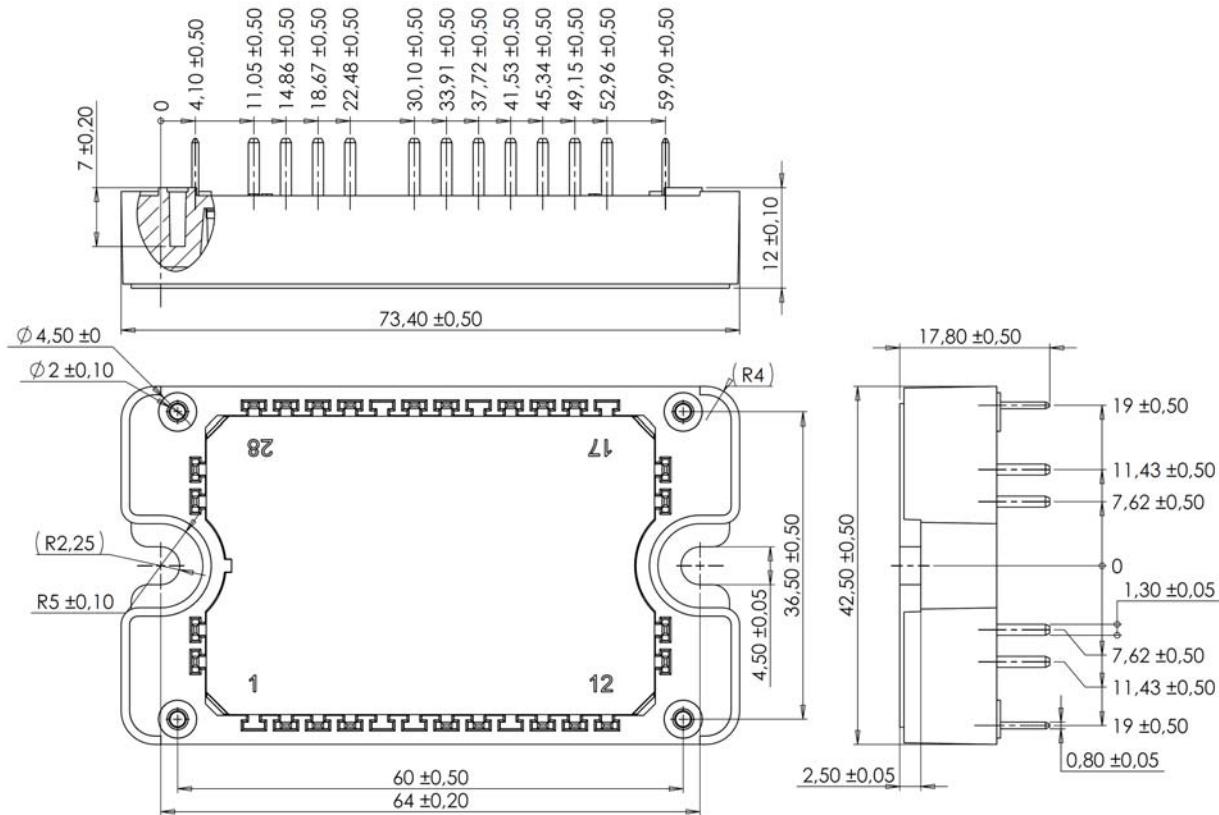
Symbol	Characteristic		Min	Max	Unit
V_{ISOL}	RMS Isolation Voltage, any terminal to case $t = 1$ min, 50/60Hz		4000		V
T_J	Operating junction temperature range		-40	150	
T_{JOP}	Recommended junction temperature under switching conditions		-40	$T_{Jmax} - 25$	$^{\circ}C$
T_{STG}	Storage Temperature Range		-40	125	
T_C	Operating Case Temperature		-40	125	
Torque	Mounting torque	To heatsink	M4	2	3
Wt	Package Weight			110	g

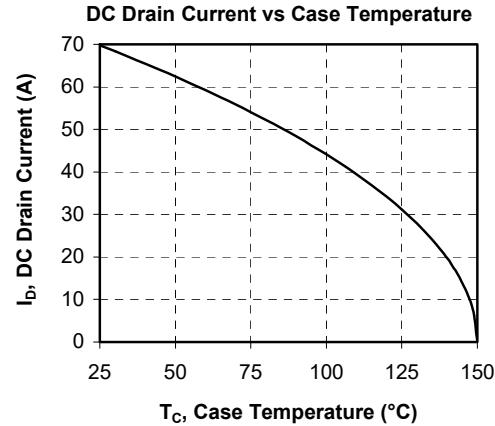
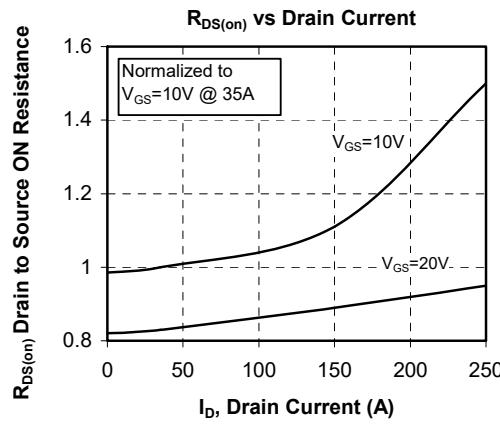
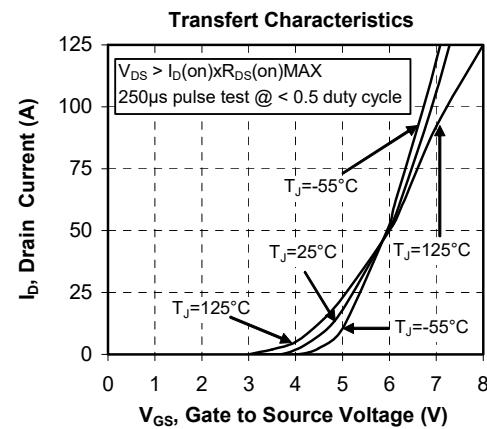
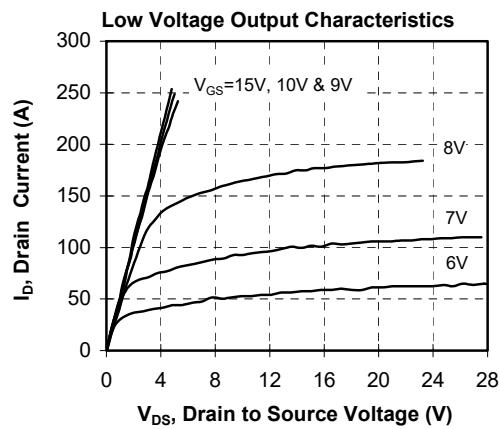
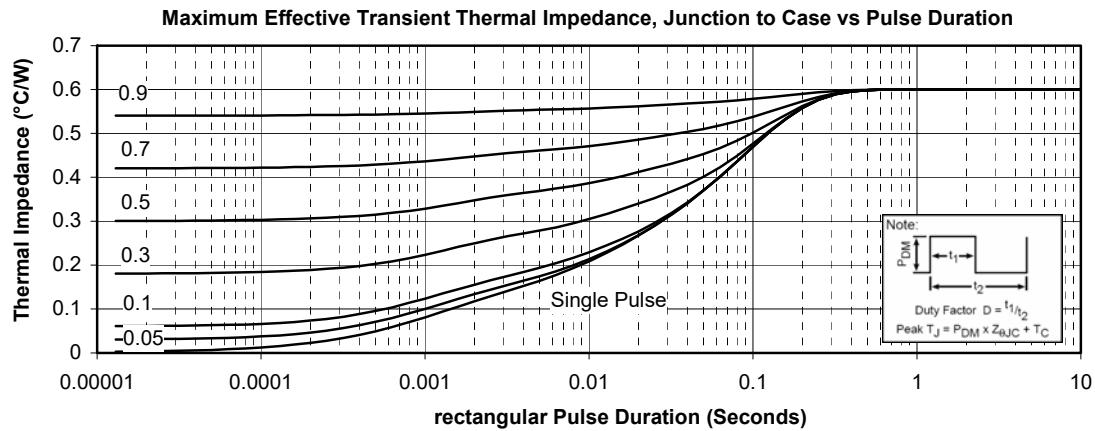
Temperature sensor NTC (see application note APT0406 on www.microsemi.com for more information).

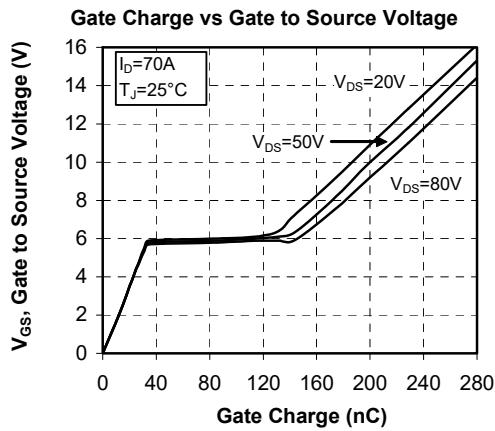
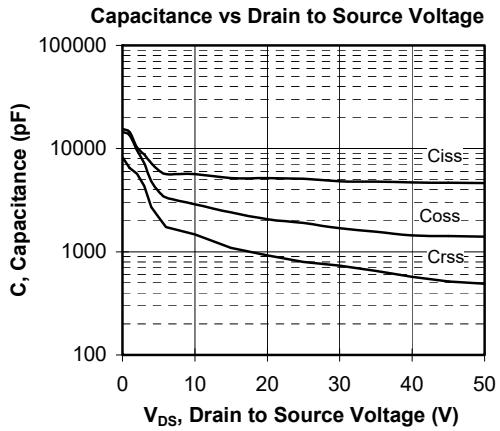
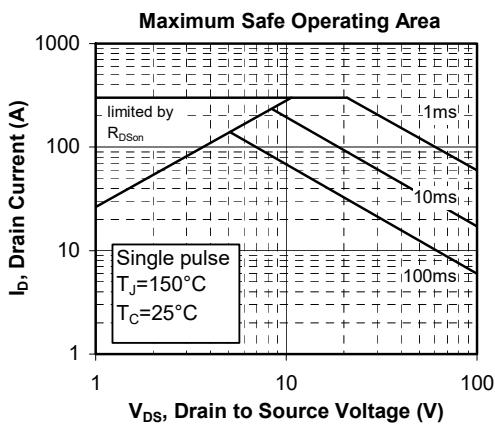
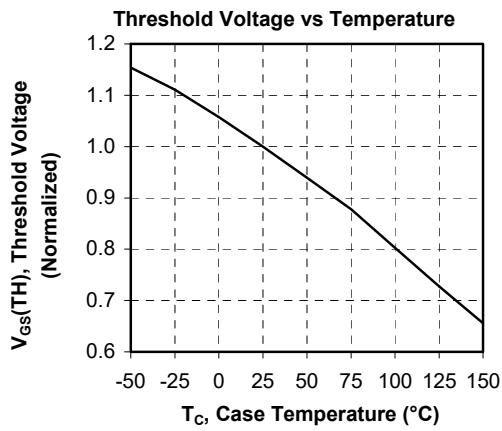
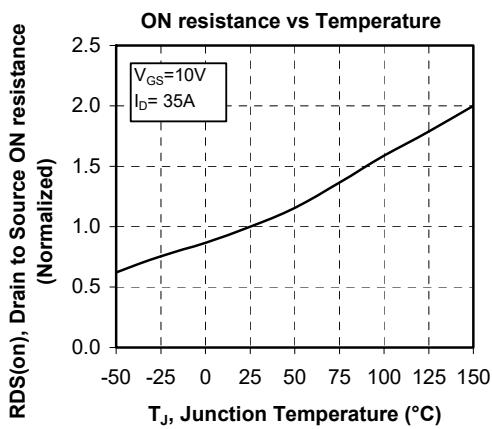
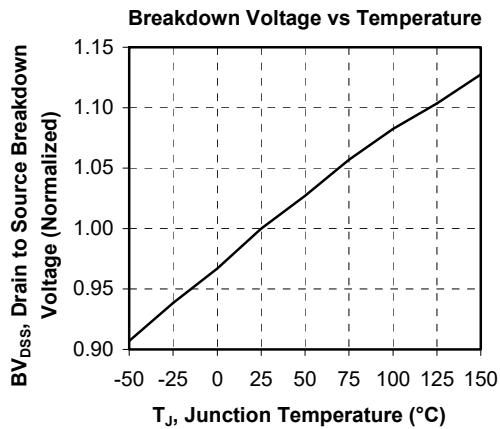
Symbol	Characteristic		Min	Typ	Max	Unit
R_{25}	Resistance @ 25°C			50		kΩ
$\Delta R_{25}/R_{25}$				5		%
$B_{25/85}$	$T_{25} = 298.15$ K			3952		K
$\Delta B/B$		$T_C=100^{\circ}C$		4		%

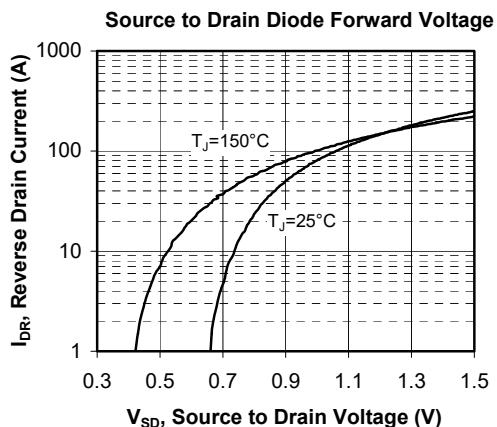
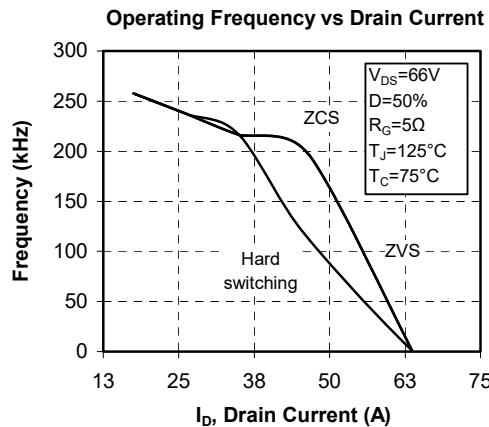
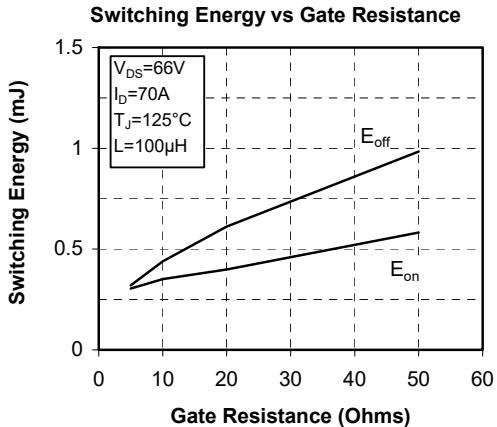
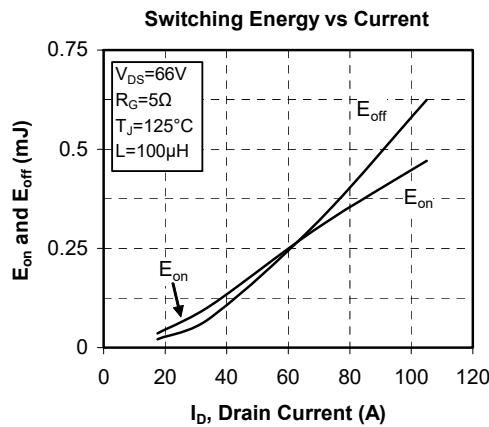
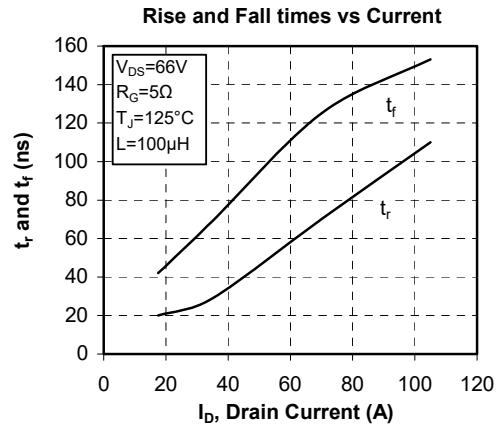
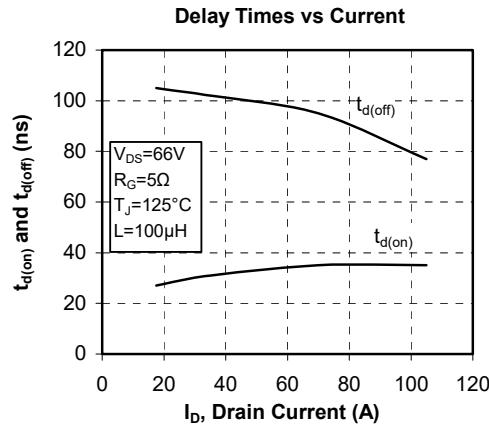
$$R_T = \frac{R_{25}}{\exp \left[B_{25/85} \left(\frac{1}{T_{25}} - \frac{1}{T} \right) \right]} \quad T: \text{Thermistor temperature}$$

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






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