

Linear MOSFET Power Module

$$V_{DSS} = 600V$$

$$R_{DSon} = 125m\Omega \text{ typ @ } T_j = 25^\circ C$$

$$I_D = 45A^* @ T_c = 25^\circ C$$

Application

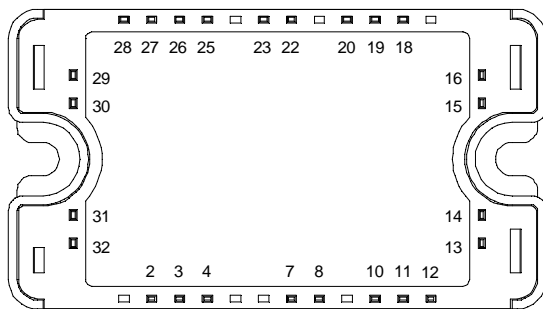
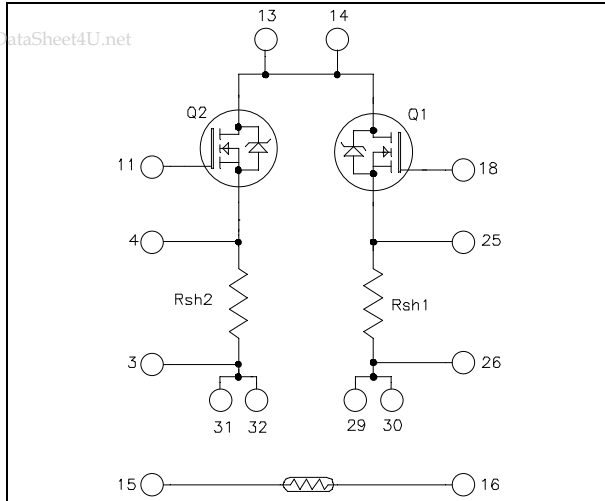
- Electronic load dedicated to power supplies and battery discharge testing

Features

- Linear MOSFET
- Very low stray inductance
- Internal thermistor for temperature monitoring
- High level of integration
- AlN substrate for improved thermal performance

Benefits

- Direct mounting to heatsink (isolated package)
- easy series and parallels combinations for power and voltage improvements
- Low junction to case thermal resistance
- Solderable terminals both for power and signal for easy PCB mounting
- Low profile
- RoHS Compliant



Pins 13/14 ; 29/30 ; 31/32 must be shorted together

Absolute maximum ratings (per leg)

Symbol	Parameter	Max ratings	Unit
V_{DSS}	Drain - Source Breakdown Voltage	600	V
I_D	Continuous Drain Current	$T_c = 25^\circ C$	45*
		$T_c = 80^\circ C$	33*
I_{DM}	Pulsed Drain current	172	A
V_{GS}	Gate - Source Voltage	± 30	V
R_{DSon}	Drain - Source ON Resistance	150	m Ω
P_D	Maximum Power Dissipation 1	$T_c = 25^\circ C$	568
I_{AR}	Avalanche current (repetitive and non repetitive)	45	A
E_{AR}	Repetitive Avalanche Energy	50	mJ
E_{AS}	Single Pulse Avalanche Energy	3000	

* Output current must be limited to 31A @ $T_c=25^\circ C$ and 22A @ $T_c=80^\circ C$ to not exceed the shunt specification.

1 In saturation mode

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 (per leg)

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS} = 600\text{V}; V_{GS} = 0\text{V}$			25	μA
		$T_j = 25^\circ\text{C}$				
$R_{DS(on)}$	Drain – Source on Resistance	$V_{GS} = 10\text{V}, I_D = 22.5\text{A}$		125	150	$\text{m}\Omega$
		$T_j = 125^\circ\text{C}$				
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS} = V_{DS}, I_D = 2.5\text{mA}$	2		4	V
I_{GSS}	Gate – Source Leakage Current	$V_{GS} = \pm 30\text{V}$			± 100	nA

Dynamic Characteristics (per leg)

Symbol	Characteristic	Test Conditions	Min	Typ	Max	Unit
C_{iss}	Input Capacitance	$V_{GS} = 0\text{V}$		7600		pF
C_{oss}	Output Capacitance	$V_{DS} = 25\text{V}$		1280		
C_{rss}	Reverse Transfer Capacitance	$f = 1\text{MHz}$		620		

Shunt Electrical Characteristics (per leg)

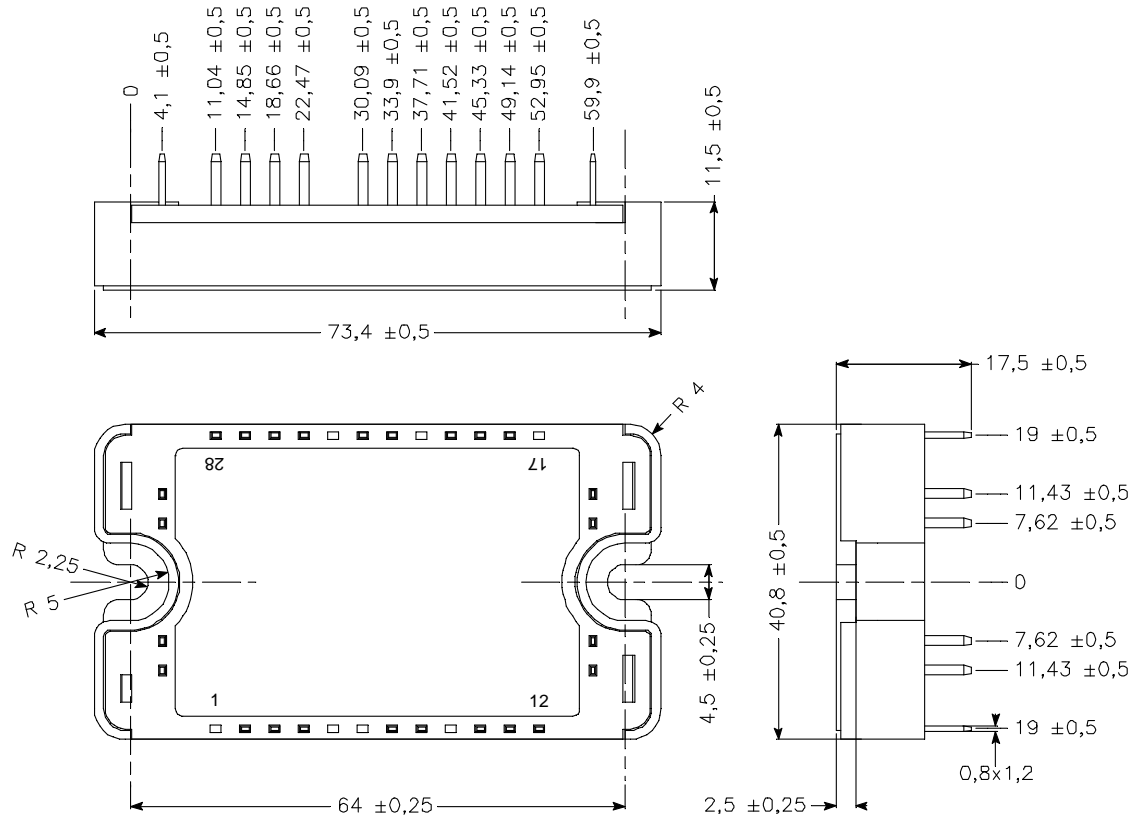
Symbol	Characteristic	Min	Typ	Max	Unit
R_{sh}	Resistance value		20		$\text{m}\Omega$
T_{sh}	Tolerance		2		%
P_{sh}	Load capacity	$T_C = 25^\circ\text{C}$		20	W
		$T_C = 80^\circ\text{C}$		10	
I_{sh}	Current capacity	$T_C = 25^\circ\text{C}$		31	A
		$T_C = 80^\circ\text{C}$		22	

Temperature sensor PTC

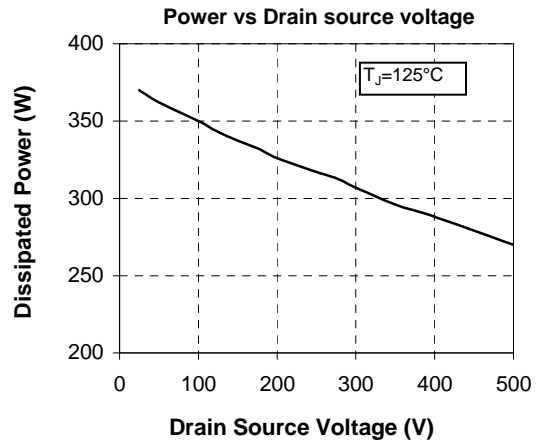
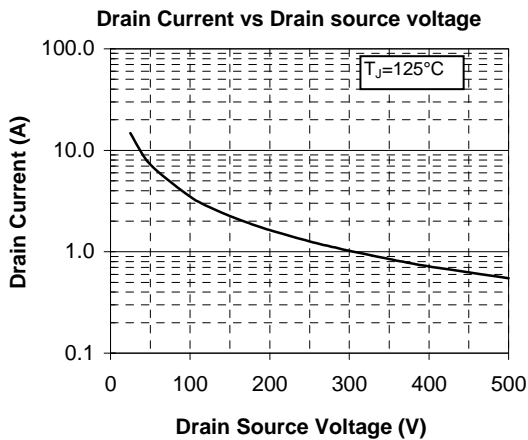
Symbol	Characteristic	Min	Typ	Max	Unit
R_{25}	Resistance @ 25°C	1980		2020	Ω
R_{100}/R_{25}	Resistance ratio	$T_{amb} = 100^\circ\text{C} \& 25^\circ\text{C}$	1.676	1.696	1.716
R_{-55}/R_{25}	Resistance ratio	$T_{amb} = -55^\circ\text{C} \& 25^\circ\text{C}$	0.48	0.49	0.50
B	Temperature coefficient		7900		ppm/K

Thermal and package characteristics

Symbol	Characteristic	Min	Typ	Max	Unit	
R_{thJC}	Junction to Case Thermal Resistance	MOSFET (per leg)		0.22	$^\circ\text{C}/\text{W}$	
V_{ISOL}	RMS Isolation Voltage, any terminal to case $t = 1\text{min}$, $I_{isol} < 1\text{mA}$, 50/60Hz	4000			V	
T_j	Operating junction temperature range	-40		150	$^\circ\text{C}$	
T_{STG}	Storage Temperature Range	-40		125		
T_C	Operating Case Temperature	-40		100		
Torque	Mounting torque	To heatsink	M4	2.5	4.7	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 (linear mode) (per leg)


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