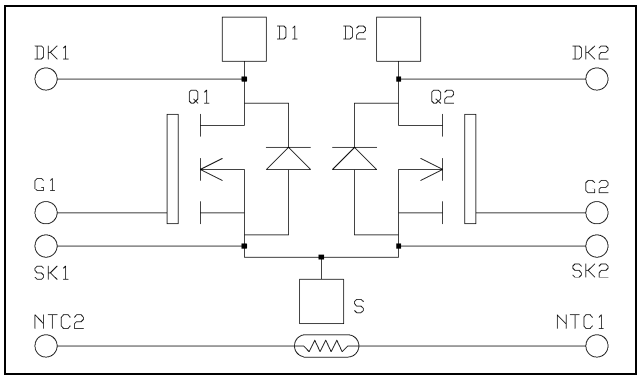
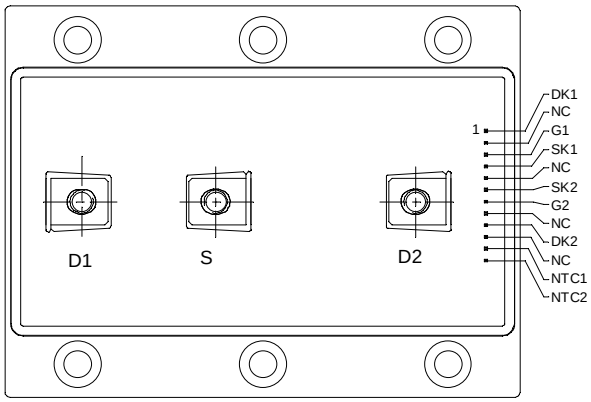
Dual common source MOSFET Power Module

V_{DSS} = 200V
R_{DSon} = 5mΩ max @ Tj = 25°C
I_D = 333A @ Tc = 25°C





Application

- AC Switches
- Switched Mode Power Supplies
- Uninterruptible Power Supplies

Features

- Power MOS V® MOSFETs
  - Low R_{DSon}
  - Low input and Miller capacitance
  - Low gate charge
  - Avalanche energy rated
  - Very rugged
- Kelvin source for easy drive
- Kelvin Drain for VDS monitoring
- Very low stray inductance
  - Symmetrical design
  - M5 power connectors
- Internal thermistor for temperature monitoring
- High level of integration

Benefits

- Outstanding performance at high frequency operation
- Direct mounting to heatsink (isolated package)
- Low junction to case thermal resistance
- Solderable terminals for signal and M5 for power for easy PCB mounting
- RoHS Compliant

Absolute maximum ratings

Symbol	*Parameter*		*Max ratings*	*Unit*
V_{DSS}	Drain - Source Breakdown Voltage		200	V
I_D	Continuous Drain Current	T_c = 25°C	333	A
		T_c = 80°C	249	
I_{DM}	Pulsed Drain current		700	
V_{GS}	Gate - Source Voltage		±30	V
R_{DSon}	Drain - Source ON Resistance		5	mΩ
P_D	Maximum Power Dissipation	T_c = 25°C	1250	W
I_{AR}	Avalanche current (repetitive and non repetitive)		333	A
E_{AR}	Repetitive Avalanche Energy		30	mJ
E_{AS}	Single Pulse Avalanche Energy		1300	

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°C unless otherwise specified

Electrical Characteristics

Symbol	*Characteristic*	*Test Conditions*		*Min*	*Typ*	*Max*	*Unit*
I_{DSS}	Zero Gate Voltage Drain Current	V_{GS} = 0V,V_{DS} = 200V	T_j = 25°C			300	µA
		V_{GS} = 0V,V_{DS} = 160V	T_j = 125°C			2000	
$R_{DS(on)}$	Drain – Source on Resistance	V_{GS} = 10V, I_D = 166.5A				5	mΩ
$V_{GS(th)}$	Gate Threshold Voltage	V_{GS} = V_{DS}, I_D = 8mA		2		4	V
I_{GSS}	Gate – Source Leakage Current	V_{GS} = ±30 V, V_{DS} = 0V				±250	nA

Dynamic Characteristics

Symbol	*Characteristic*	*Test Conditions*	*Min*	*Typ*	*Max*	*Unit*
C_{iss}	Input Capacitance	V_{GS} = 0V V_{DS} = 25V f = 1MHz		40.8		nF
C_{oss}	Output Capacitance			9.1		
C_{rss}	Reverse Transfer Capacitance			3.1		
Q_g	Total gate Charge	V_{GS} = 10V V_{Bus} = 100V I_D = 333A		1184		nC
Q_{gs}	Gate – Source Charge			376		
Q_{gd}	Gate – Drain Charge			600		
$T_{d(on)}$	Turn-on Delay Time	**Resistive Switching** V_{GS} = 15V V_{Bus} = 100V I_D = 333A R_G = 0.22 Ω		15		ns
T_r	Rise Time			25		
$T_{d(off)}$	Turn-off Delay Time			50		
T_f	Fall Time			10		

Source - Drain diode ratings and characteristics

Symbol	*Characteristic*	*Test Conditions*		*Min*	*Typ*	*Max*	*Unit*
I_S	Continuous Source current (Body diode)		Tc = 25°C			333	A
			Tc = 80°C			249	
V_{SD}	Diode Forward Voltage	V_{GS} = 0V, I_S = - 333A				1.3	V
t_{rr}	Reverse Recovery Time	I_S = - 333A, V_R = 100V di_S/dt = 800A/µs			160		ns
Q_{rr}	Reverse Recovery Charge	I_S = - 333A, V_R = 100V di_S/dt = 800A/µs			10.4		µC

Thermal and package characteristics

Symbol	*Characteristic*			*Min*	*Typ*	*Max*	*Unit*
R_{thJC}	Junction to Case Thermal Resistance					0.1	°C/W
V_{ISOL}	RMS Isolation Voltage, any terminal to case t =1 min, I isol<1mA, 50/60Hz			2500			V
T_J	Operating junction temperature range			-40		150	°C
T_{STG}	Storage Temperature Range			-40		125	
T_C	Operating Case Temperature			-40		100	
Torque	Mounting torque	To heatsink	M5	2		3.5	N.m
		For terminals	M5	2		3.5	
Wt	Package Weight					550	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
$B_{25/85}$	T_{25} = 298.15 K		3952		K

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

T: Thermistor temperature
R_T: Thermistor value at T

Package outline (dimensions in mm)