

P-Channel Enhancement Mode Power MOSFET

Description

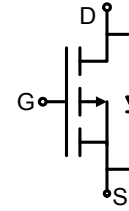
The HM2319PR uses advanced trench technology to provide excellent $R_{DS(ON)}$. This device is suitable for use as a load switch and battery protection applications.

General Features

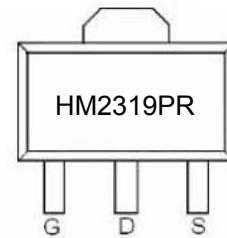
- $V_{DS} = -40V, I_D = -6.0A$
 $R_{DS(ON)} < 126m\Omega @ V_{GS} = -4.5V$
 $R_{DS(ON)} < 85m\Omega @ V_{GS} = -10V$
- High power and current handling capability
- Lead free product is acquired
- Surface mount package

Application

- Battery applications
- Load switch



Schematic diagram



SOT-89 -3L top view

Package Marking and Ordering Information

Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
HM2319PR	HM2319PR	SOT89-3L	Ø180mm	8 mm	3000 units

Absolute Maximum Ratings ($T_A = 25^\circ C$ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	-40	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous	I_D	-6.0	A
Drain Current-Pulsed (Note 1)	I_{DM}	-18	A
Maximum Power Dissipation	P_D	2.0	W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 To 150	$^\circ C$

Thermal Characteristic

Thermal Resistance, Junction-to-Ambient (Note 2)	$R_{\theta JA}$	62.5	$^\circ C/W$
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Electrical Characteristics ($T_A = 25^\circ C$ unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0V, I_D = -250\mu A$	-40	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -40V, V_{GS} = 0V$	-	-	-1	μA

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Gate-Body Leakage Current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V	-	-	±100	nA
On Characteristics (Note 3)						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =-250μA	-1	-1.5	-3	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =-10V, I _D =-5A	-	73	85	mΩ
		V _{GS} =-4.5V, I _D =-6A	-	98	126	mΩ
Forward Transconductance	g _{FS}	V _{DS} =-5V, I _D =-4.1A	10	-	-	S
Dynamic Characteristics (Note4)						
Input Capacitance	C _{iss}	V _{DS} =-20V, V _{GS} =0V, F=1.0MHz	-	650	-	PF
Output Capacitance	C _{oss}		-	90	-	PF
Reverse Transfer Capacitance	C _{rss}		-	70	-	PF
Switching Characteristics (Note 4)						
Turn-on Delay Time	t _{d(on)}	V _{DD} =-20V, ,R _L =2Ω V _{GS} =-10V,R _{GEN} =3Ω	-	9	-	nS
Turn-on Rise Time	t _r		-	8	-	nS
Turn-Off Delay Time	t _{d(off)}		-	28	-	nS
Turn-Off Fall Time	t _f		-	10	-	nS
Total Gate Charge	Q _g	V _{DS} =-20V, I _D =-3.1A, V _{GS} =-10V	-	14	-	nC
Gate-Source Charge	Q _{gs}		-	2.9	-	nC
Gate-Drain Charge	Q _{gd}		-	3.8	-	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage (Note 3)	V _{SD}	V _{GS} =0V, I _S =-2.5A	-	0.8	1.2	V
Diode Forward Current (Note 2)	I _S		-	-	-6.0	A

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, $t \leq 10$ sec.
3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
4. Guaranteed by design, not subject to production

Typical Electrical and Thermal Characteristics

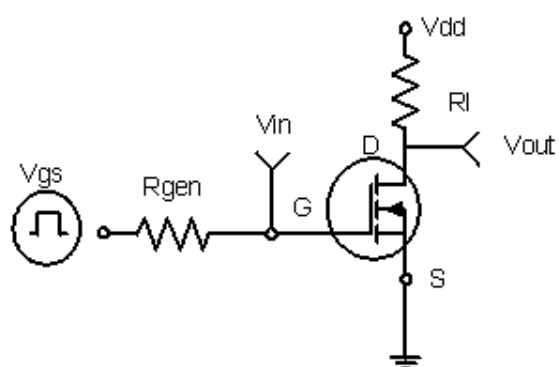


Figure 1: Switching Test Circuit

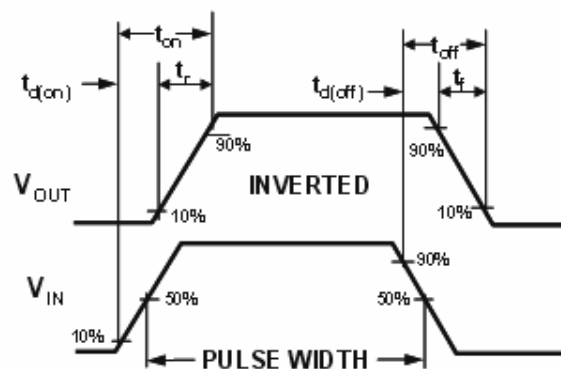
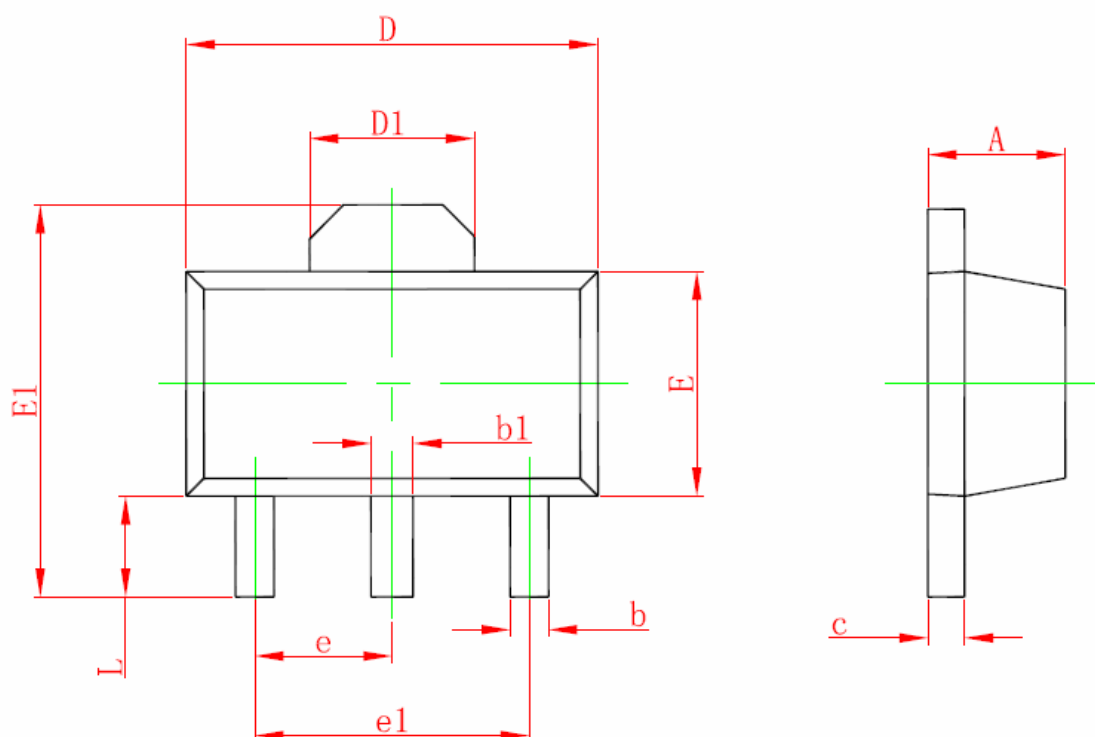


Figure 2: Switching Waveforms

SOT-89-3L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.400	1.600	0.055	0.063
b	0.320	0.520	0.013	0.020
b1	0.400	0.580	0.016	0.023
c	0.350	0.440	0.014	0.017
D	4.400	4.600	0.173	0.181
D1	1.550 REF.		0.061 REF.	
E	2.300	2.600	0.091	0.102
E1	3.940	4.250	0.155	0.167
e	1.500 TYP.		0.060 TYP.	
e1	3.000 TYP.		0.118 TYP.	
L	0.900	1.200	0.035	0.047

Notes

1. All dimensions are in millimeters.
2. Tolerance $\pm 0.10\text{mm}$ (4 mil) unless otherwise specified
3. Package body sizes exclude mold flash and gate burrs. Mold flash at the non-lead sides should be less than 5 mils.
4. Dimension L is measured in gauge plane.
5. Controlling dimension is millimeter, converted inch dimensions are not necessarily exact.