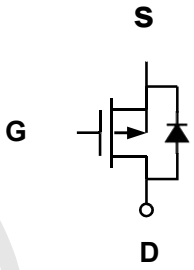
P-Channel Enhancement Mode Power MOSFET

Description

The MX2319 uses advanced trench technology to provide excellent RDS(ON), low gate charge and operation with gatevoltages as low as 2.5V. This device is suitable for use as a load switching application and a wide variety of other applications.

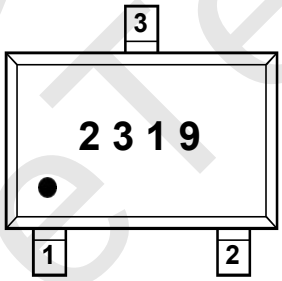


Schematic diagram

General Features

VDS >=-18V,ID = -7A
RDS(ON)(Typ.) =17mΩ@ VGS=-4.5V
RDS(ON) (Typ.)= 22mΩ @ VGS=-2.5V

Asvanced trench MOSFET process technology
Ultra low on-resistance with low gate charge



Marking and pin Assignment

Application

- PWM applications
- Load switch

SOT-23-3 (TOP VIEW)

Absolute Maximum Ratings (TA=25℃ unless otherwise noted)

parameter	symbol	limit	unit
Drain-source voltage	V_{DS}	-18	V
Gate-source voltage	V_{GS}	±12	V
Drain current-continuous	I_D	-7	A
Drain Current-Pulsed (Note 1)	I_{DM}	-24	A
Maximum power dissipation	P_D	1.4	W
Operating junction Temperature range	Tj	-55—150	℃

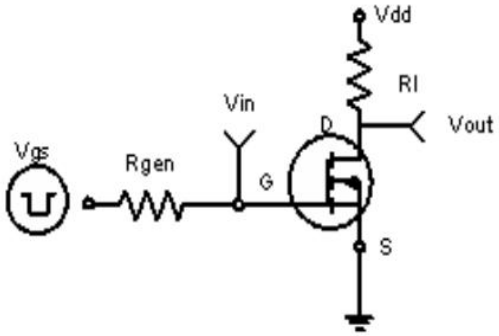
Electrical Characteristics (TA=25℃ unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V I_D=-250μA	-18	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-16V,V_{GS}=0V	-	-	-1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±12V,V_{DS}=0V	-	-	±100	nA
On Characteristics (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=-250μA	-0.4	-0.7	-1.0	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=-4.5V, I_D=-6A	-	17	20	mΩ
		V_{GS}=-2.5V, I_D=-5A	-	22	28	
Forward Transconductance	g_{FS}	V_{DS}=-5V, I_D=-8A	-	33	-	S
Drain-Source Diode Characteristics						
Diode Forward Voltage (Note 3)	V_{SD}	V_{GS}=0V,I_S=-1A	-	-	-1.2	V
Diode Forward Current (Note 2)	I_S		-	-	-3.5	A
Dynamic Characteristics (Note4)						
Input Capacitance	C_{lss}	V_{DS}=-6V,V_{GS}=0V, F=1.0MHz	-	1370	-	PF
Output Capacitance	C_{oss}		-	350	-	PF
Reverse Transfer Capacitance	C_{rss}		-	258	-	PF
Switching Characteristics (Note 4)						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=-6V, R_L=0.75Ω V_{GS}=-4.5V, R_{GEN}=3Ω	-	11	-	nS
Turn-on Rise Time	t_r		-	25	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	70	-	nS
Turn-Off Fall Time	t_f		-	42	-	nS
Total Gate Charge	Q_g	V_{DS}=-6V,I_D=-8A,V_{GS}=-4.5V	-	13	-	nC
Gate-Source Charge	Q_{gs}		-	2	-	nC
Gate-Drain Charge	Q_{gd}		-	3	-	nC

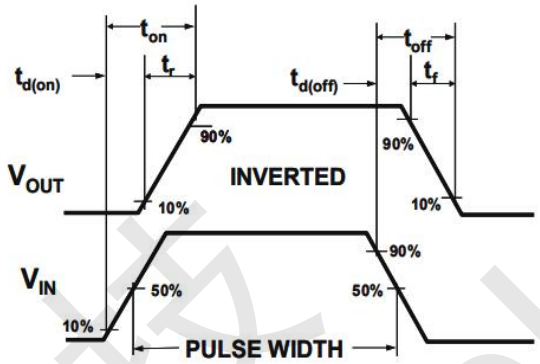
otes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2.Surface Mounted on FR4 Board, t ≤ 10 sec.
3.Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
4.Guaranteed by design, not subject to produc

Typical Performance Characteristics



Switching Test Circuit



Switching Waveforms

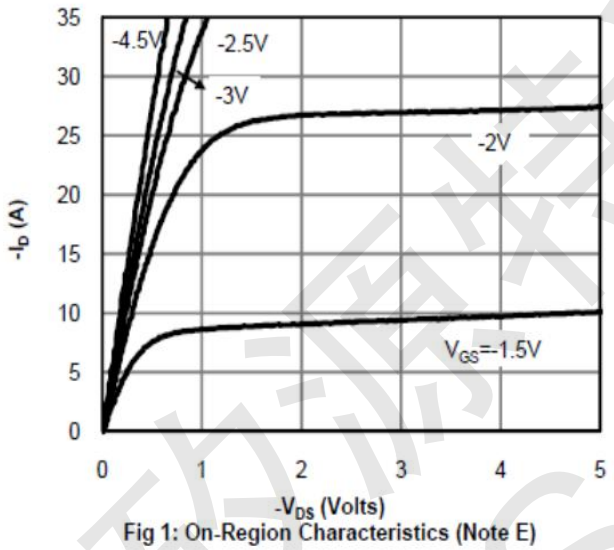


Fig 1: On-Region Characteristics (Note E)

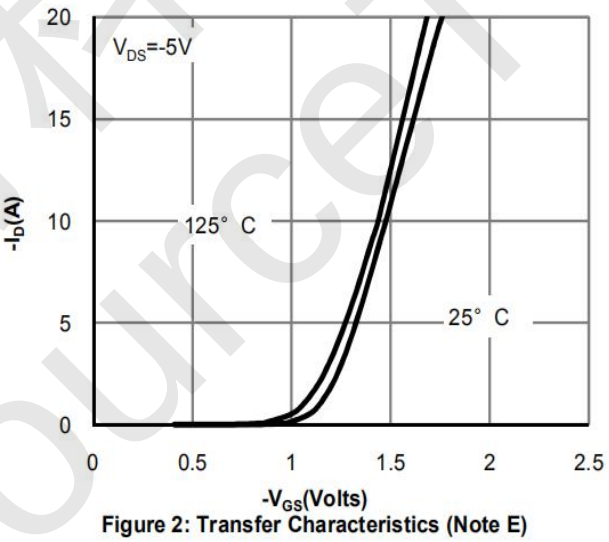


Figure 2: Transfer Characteristics (Note E)

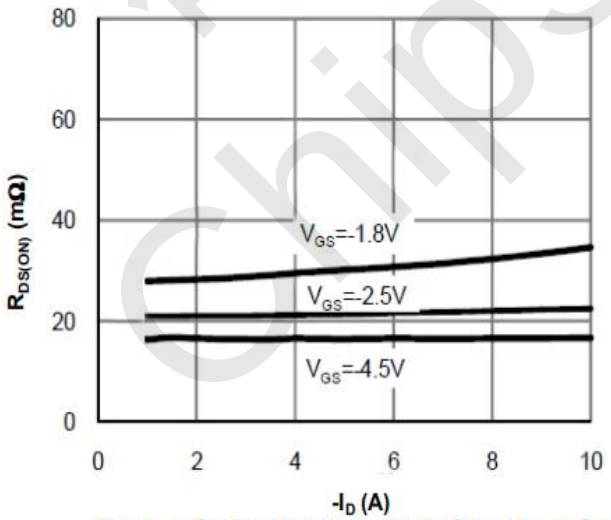


Figure 3: On-Resistance vs. Drain Current and Gate Voltage (Note E)

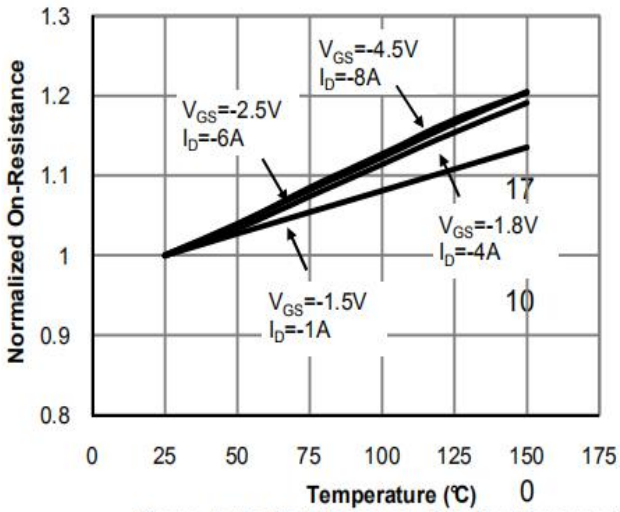


Figure 4: On-Resistance vs. Junction Temperature (Note E)

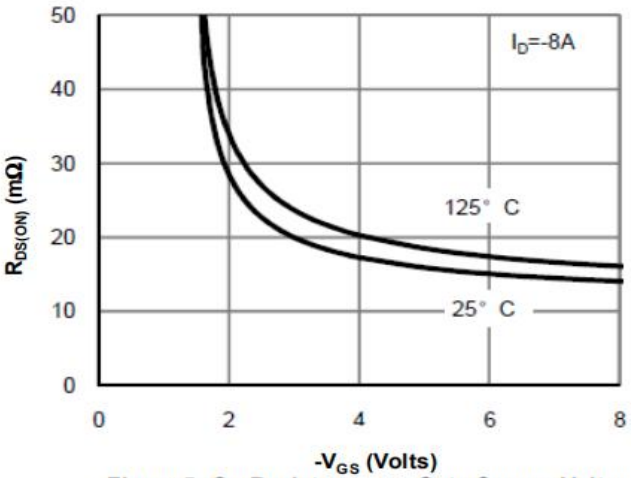


Figure 5: On-Resistance vs. Gate-Source Voltage (Note E)

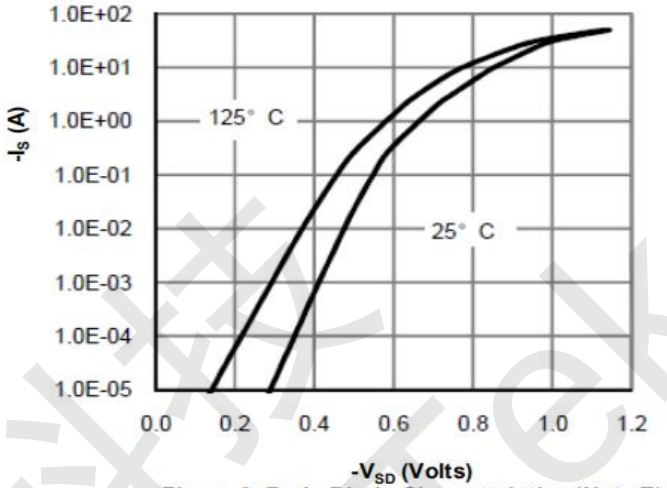


Figure 6: Body-Diode Characteristics (Note E)

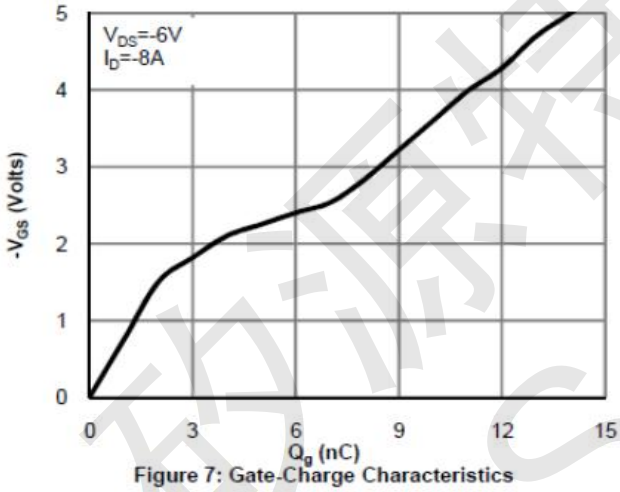


Figure 7: Gate-Charge Characteristics

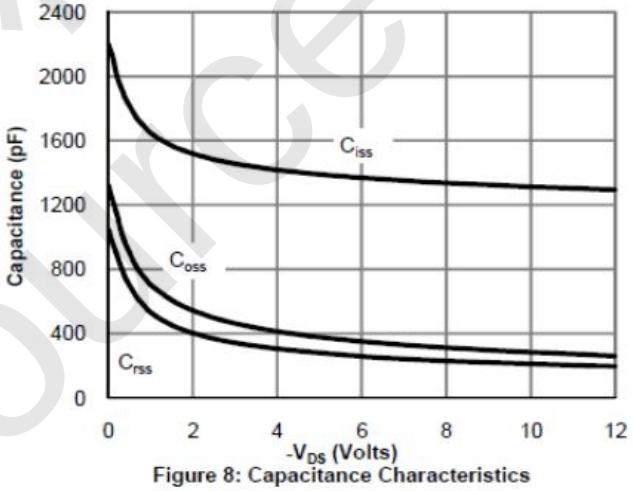


Figure 8: Capacitance Characteristics

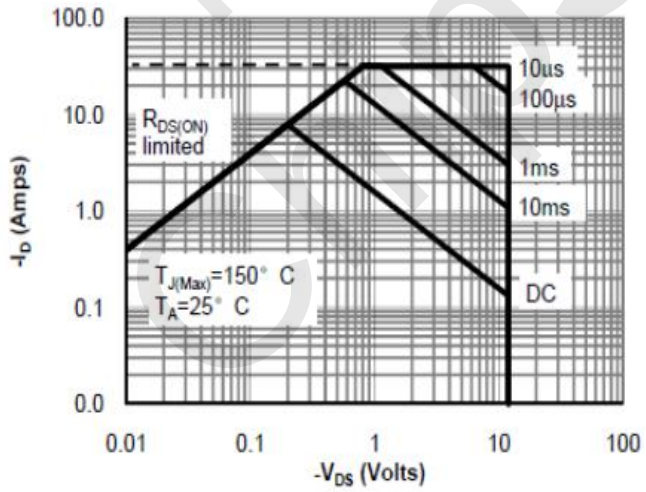


Figure 9: Maximum Forward Biased Safe Operating Area (Note F)

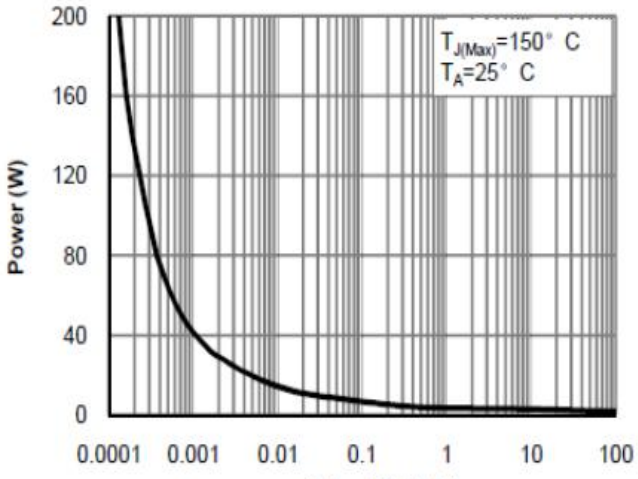


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note H)

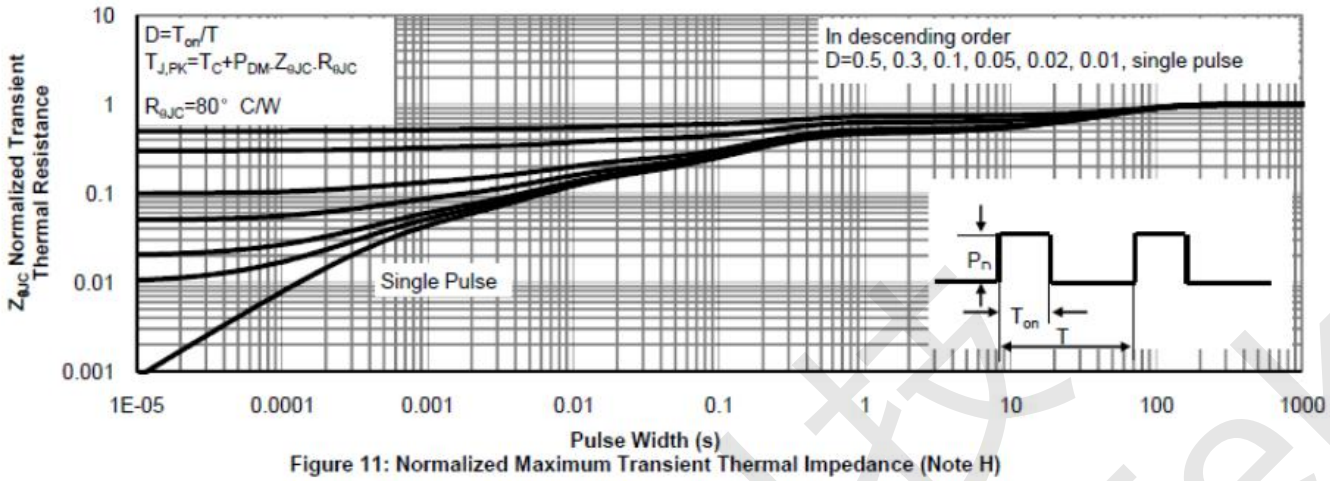
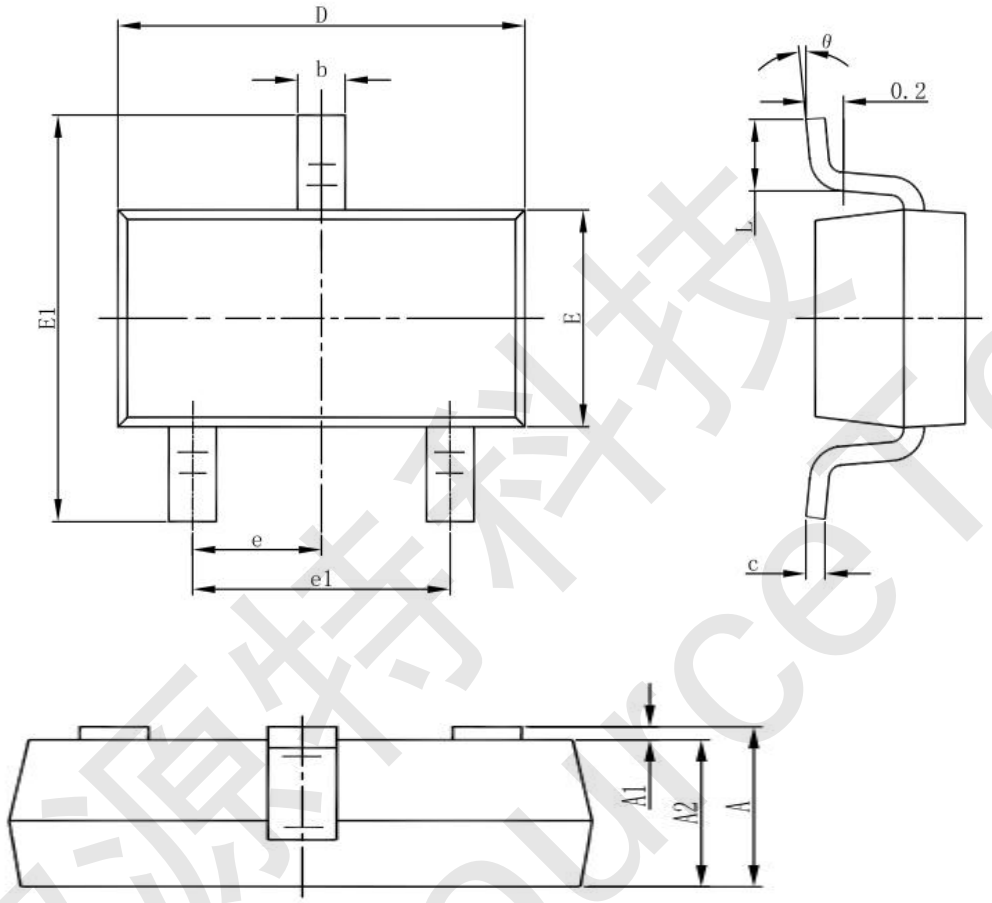


Figure 11: Normalized Maximum Transient Thermal Impedance (Note H)

SOT-23 PACKAGE INFORMATION



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°