

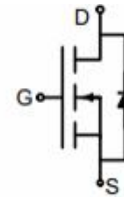
2302 N-channel Enhancement Mode Power MOSFET

General Features

- $V_{DS} = 20V, I_D = 2.8A$
 $R_{DS(ON)} : 45m\Omega @ V_{GS}=2.5V$
 $R_{DS(ON)} : 35m\Omega @ V_{GS}=4.5V$
- High power and current handling capability
- Lead free product is acquired
- Surface mount package

Application

- PWM applications
- Load switch
- Power management



Schematic diagram



SOT-23 top view

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

Symbol	Parameter	Value	Units
V_{DS}	Drain-Source voltage	20	V
V_{GS}	Gate-Source voltage	± 12	V
I_D	Drain current	2.8	A
I_{DM}	Drain Current -Pulsed (Note 1)	12	A
P_D	Power Dissipation	0.8	W
T_J	Junction Temperature	150	$^\circ C$
T_{stg}	Storage Temperature	-55-150	$^\circ C$

Thermal Characteristic

$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient (Note 2)	156	$^\circ C/W$
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ELECTRICAL CHARACTERISTICS ($T_A=25^\circ C$ unless otherwise specified)

Parameter	Symbol	Test conditions	MIN	TYP	MAX	UNIT
Off Characteristics						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS}=0V, I_D=250\mu A$	20			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=20V, V_{GS}=0V$			1	μA
Gate-body Leakage	I_{GSS}	$V_{DS}=0V, V_{GS}=\pm 12V$			± 100	nA

On Characteristics (Note 3)						
Gate-Threshold Voltage	Vth(GS)	VDS= VGS, ID=250 uA	0.4		1.0	V
Drain-Source On-Resistance	RDS(ON)	VGS=4. 5V, ID=2.8A		35	50	m Ω
		VGS=2. 5V, ID=2.0A		45	80	m Ω
Forward Trans conductance	Gfs	VDS=5. 0V, ID=2.0A	4			s
Dynamic Characteristics (Note4)						
Input Capacitance	Ciss	VDS=10. 0V, VGS=0V, f=1MHz		240		pF
Output Capacitance	Coss			45		
Reverse Transfer Capacitance	Crss			13		
Switching Characteristics (Note 4)						
Turn-on Delay Time	td(on)	VDD=10. 0V, RL=2.9Ω , VGS=4. 5V,RGEN=10Ω		2.3		nS
Turn-on Rise Time	tr			3.1		nS
Turn-off Delay Time	td(off)			20		nS
Turn-off Fall Time	tr			2.5		nS
Total Gate Charge	Qg	VDS=10. 0V, ID=2. 5A, VGS=4. 5V,		2.7		nC
Gate-Source Charge	Qgs			0.4		nC
Gate-Drain Charge	Qgd			0.5		nC
Drain-Source Diode Characteristics						
Diode Forward Voltage(Note 3)	VSD	VGS=0V, ID=2.8A			1.2	V
Diode Forward Current(Note 2)	Is				2.8	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 μ s, Duty Cycle $\leq$ 2%.
4. Guaranteed by design, not subject to production

Typical Characteristics

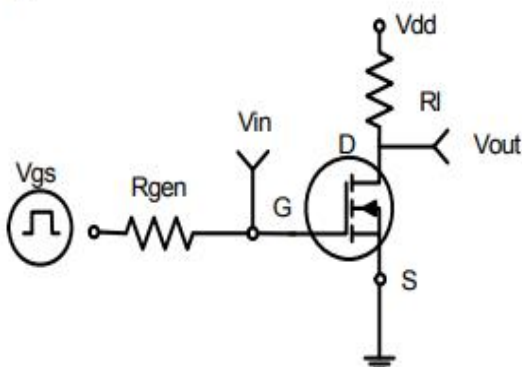


Figure 1: Switching Test Circuit

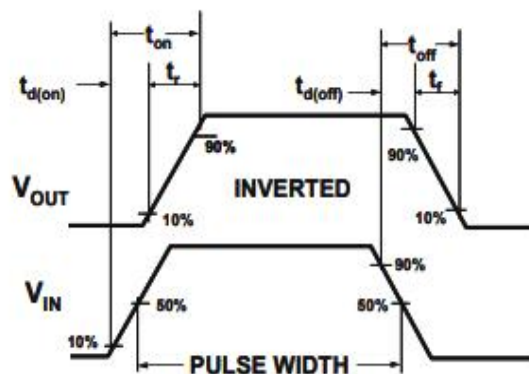


Figure 2: Switching Waveforms

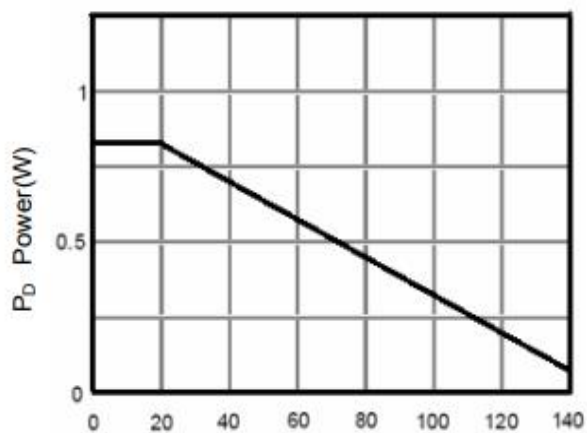


Figure 3 Power Dissipation

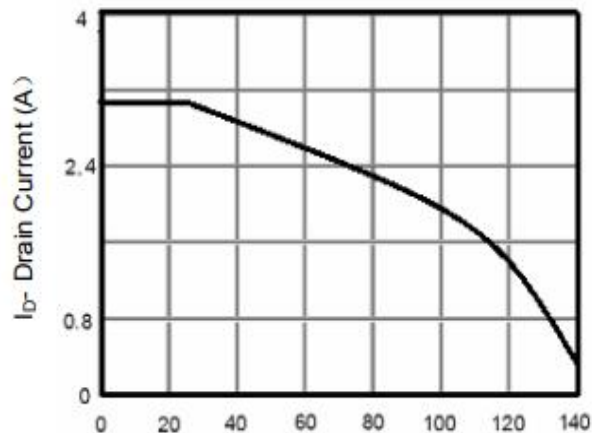


Figure 4 Drain Current

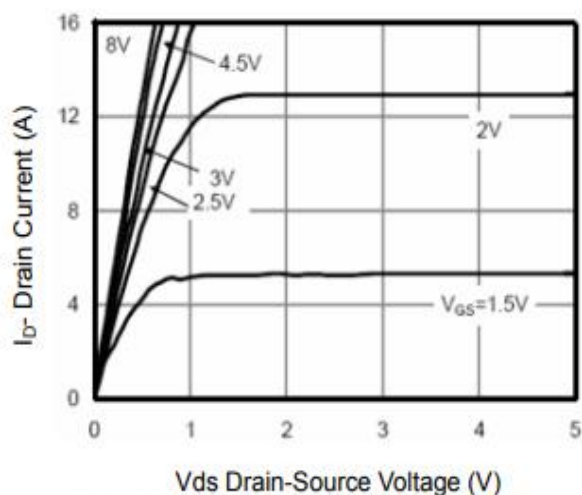


Figure 5 Output Characteristics

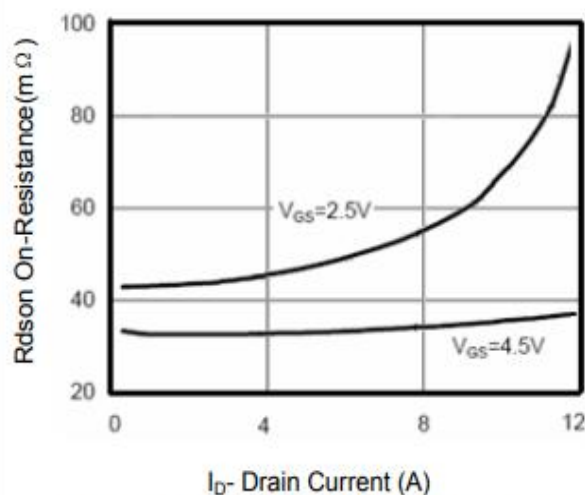
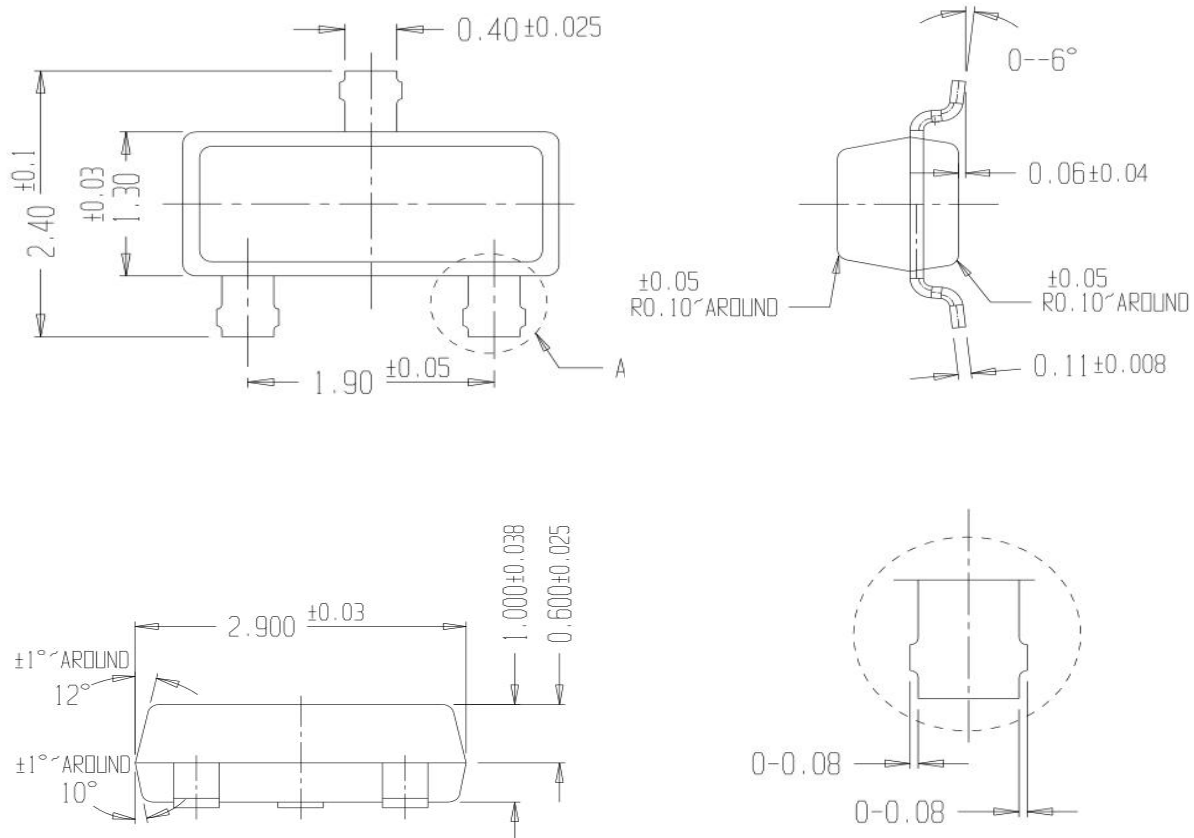


Figure 6 Drain-Source On-Resistance

SOT-23 Package information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	MIN	MAX	MIN	MAX
A	0.962	1.038	0.038	0.040
A1	0.575	0.625	0.023	0.025
b	0.40	0.60	0.016	0.024
c	0.08	0.15	0.003	0.06
D	2.87	2.93	0.113	0.115
E	1.27	1.33	0.05	0.052
E1	2.3	2.5	0.090	0.098
e 1	1.85	1.95	0.073	0.077
L	0.31	0.44	0.012	0.017
L1	0.50	0.60	0.020	0.024
e	0.02	0.1	0.000	0.004