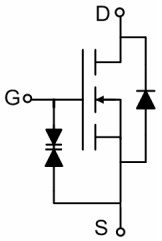
N-Channel Enhancement Mode Power MOSFET

General Features

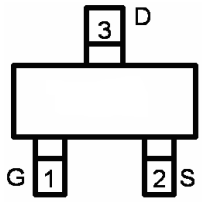
- V_{DS} = 30V,I_D = 0.2A
  $R_{DS(ON)}$ < 4Ω @ V_{GS}=4.5V
  $R_{DS(ON)}$ < 8Ω @ V_{GS}=2.5V
  ESD Rating：HBM 2300V
- High power and current handing capability
- Lead free product is acquired
- Surface mount package

Application

- Direct logic-level interface: TTL/CMOS
- Drivers: relays, solenoids, lLamps, hammers,display, memories, transistors, etc.
- Battery operated systems
- Solid-state relays



Schematic diagram



Marking and pin assignment

SOT-323 top view

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

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous	I_D	0.2	A
Drain Current-Pulsed (Note 1)	I_{DM}	0.58	A
Maximum Power Dissipation	P_D	0.35	W
Operating Junction and Storage Temperature Range	T_J,T_{STG}	-55 To 150	℃

Thermal Characteristic

Thermal Resistance,Junction-to-Ambient (Note 2)	$R_{\theta JA}$	350	℃/W

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	30	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=30V,V_{GS}=0V	-	-	1	μA

Gate-Body Leakage Current	I_{GSS}	V_{GS}=±10V,V_{DS}=0V	-	-	±500	nA
		V_{GS}=±12V,V_{DS}=0V	-	-	±10	uA
On Characteristics (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS},I_D=250μA	0.8	1.1	1.5	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=4.5V, I_D=0.2A	-	2	4	Ω
		V_{GS}=2.5V, I_D=0.1A	-	4	8	Ω
Forward Transconductance	g_{FS}	V_{DS}=10V,I_D=0.2A	0.2	-	-	S
Dynamic Characteristics (Note4)						
Input Capacitance	C_{lss}	V_{DS}=20V,V_{GS}=0V, F=1.0MHz	-	30	-	PF
Output Capacitance	C_{oss}		-	15	-	PF
Reverse Transfer Capacitance	C_{rss}		-	6	-	PF
Switching Characteristics (Note 4)						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=20V,I_D=0.2A V_{GS}=10V,R_{GEN}=6Ω	-	-	5	nS
Turn-on Rise Time	t_r		-	-	5	nS
Turn-Off Delay Time	$t_{d(off)}$		-	-	60	nS
Turn-Off Fall Time	t_f		-	-	35	nS
Total Gate Charge	Q_g	V_{DS}=20V,I_D=0.2A, V_{GS}=10V	-	-	2.4	nC
Drain-Source Diode Characteristics						
Diode Forward Voltage (Note 3)	V_{SD}	V_{GS}=0V,I_S=0.2A	-	-	1.3	V
Diode Forward Current (Note 2)	I_S		-	-	0.2	A

Notes:

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 production

Typical Electrical and Thermal Characteristics

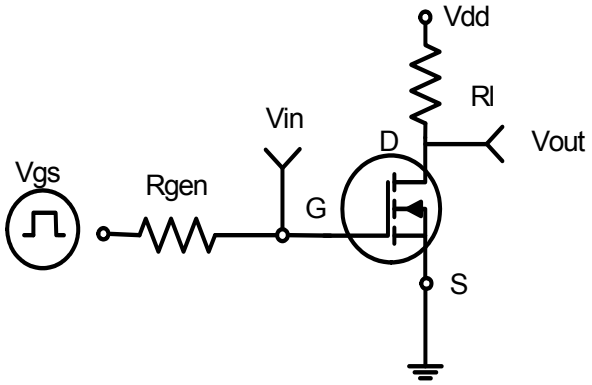


Figure 1:Switching Test Circuit

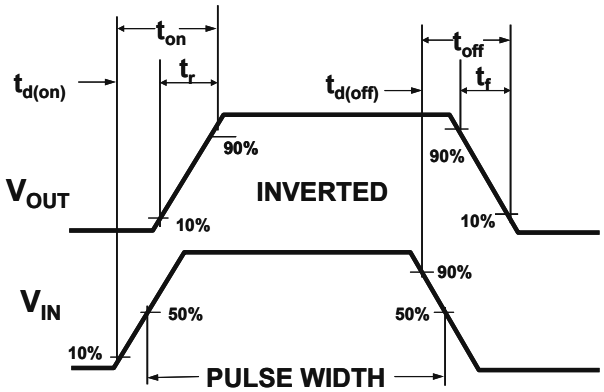


Figure 2:Switching Waveforms

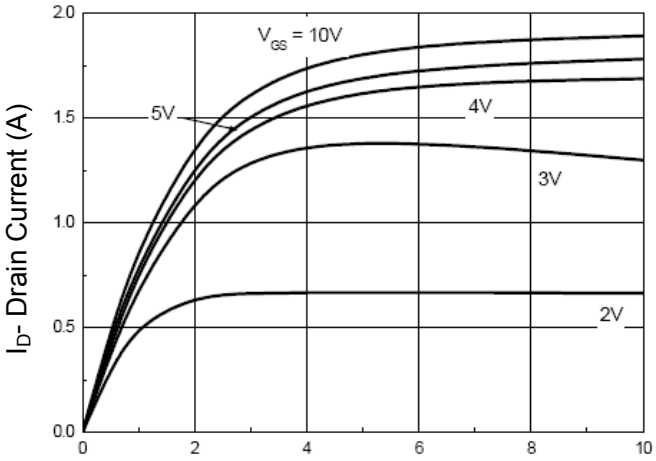


Figure 3 Output CHARACTERISTICS

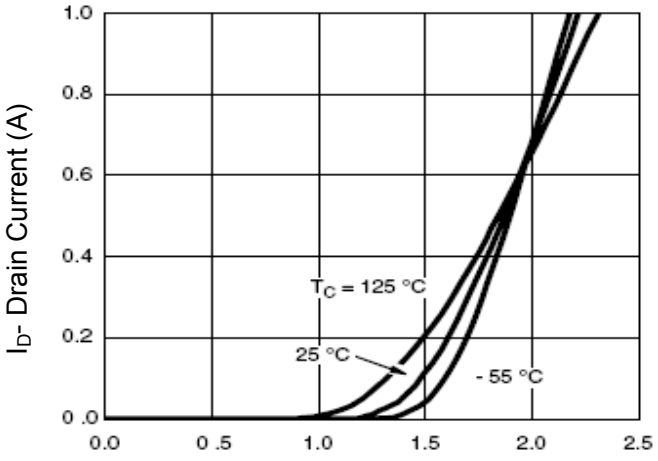


Figure 4 Transfer Characteristics

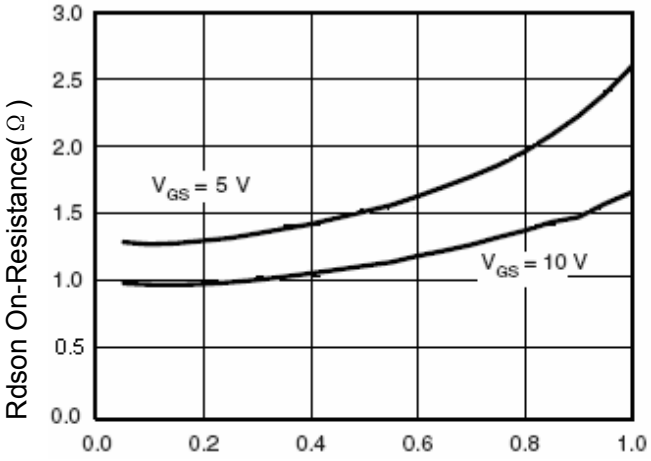


Figure 5 Drain-Source On-Resistance

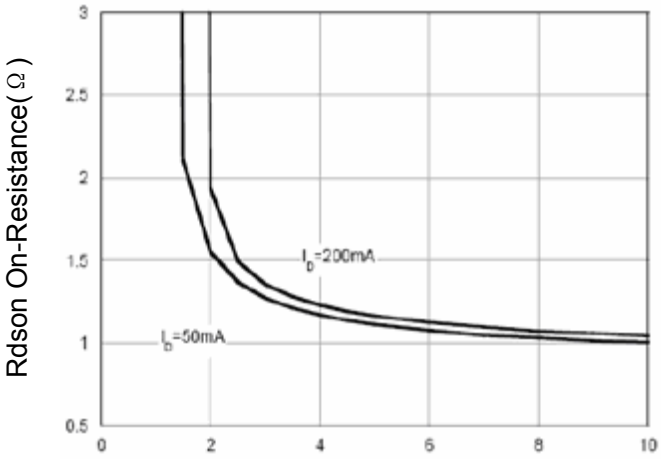


Figure 6 Rdson vs Vgs

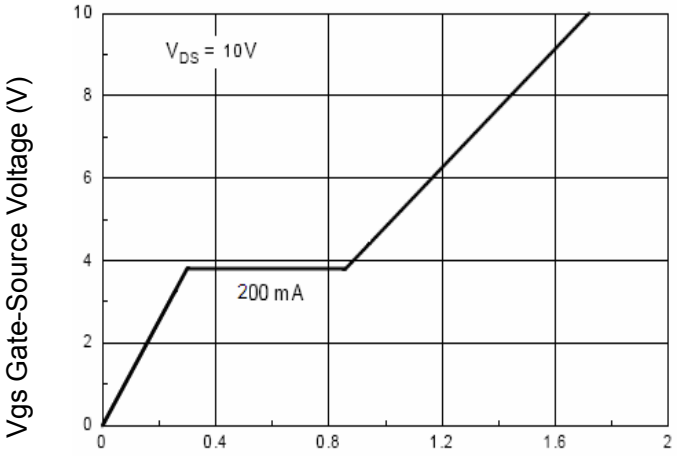


Figure 7 Gate Charge

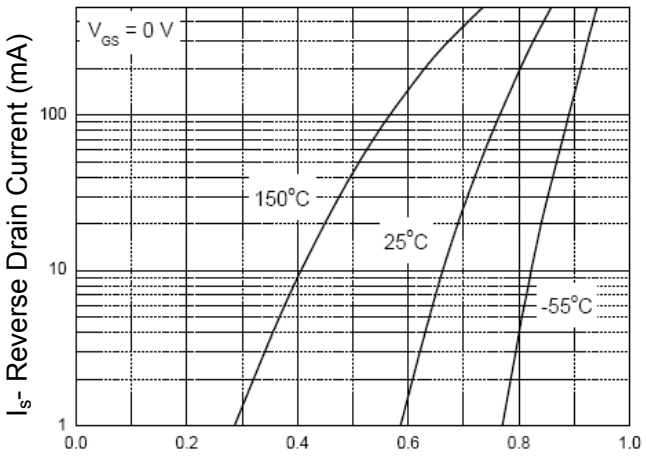


Figure 8 Source-DrainDiode Forward

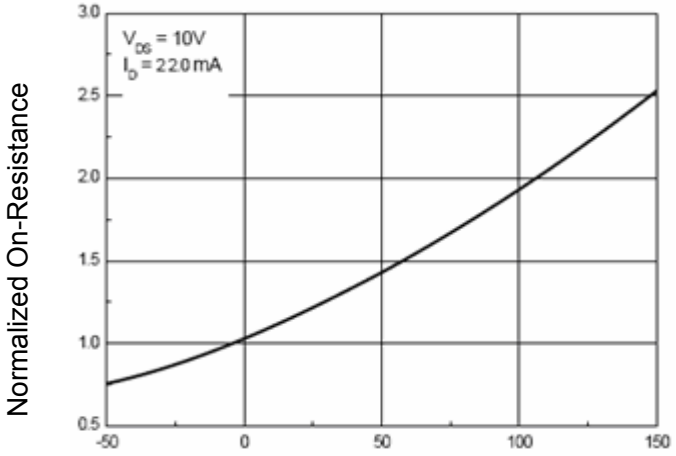


Figure 9 Drain-Source On-Resistance

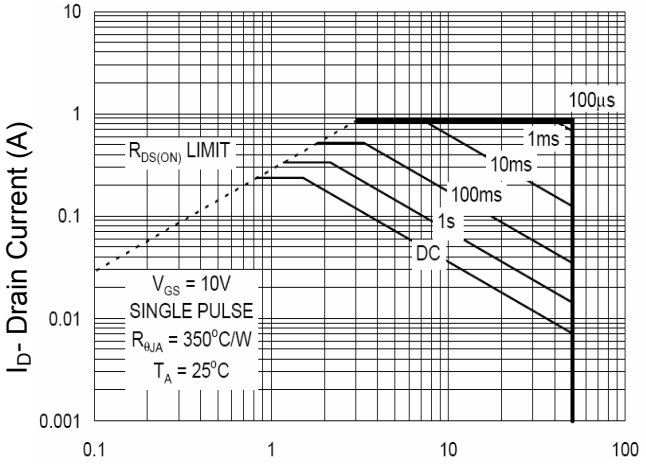


Figure 10 Safe Operation Area

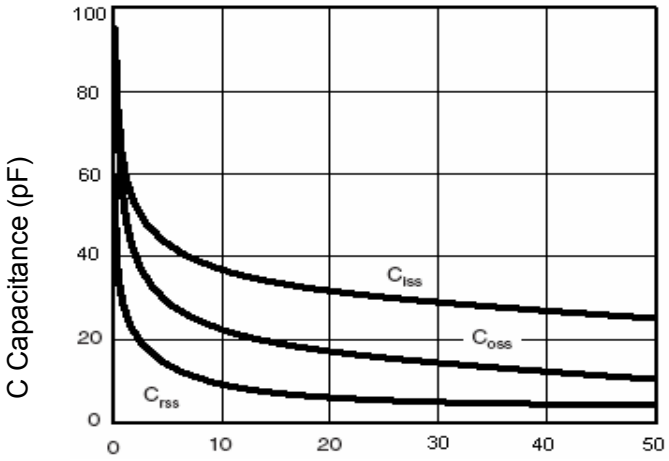


Figure 11 Capacitance vs Vds

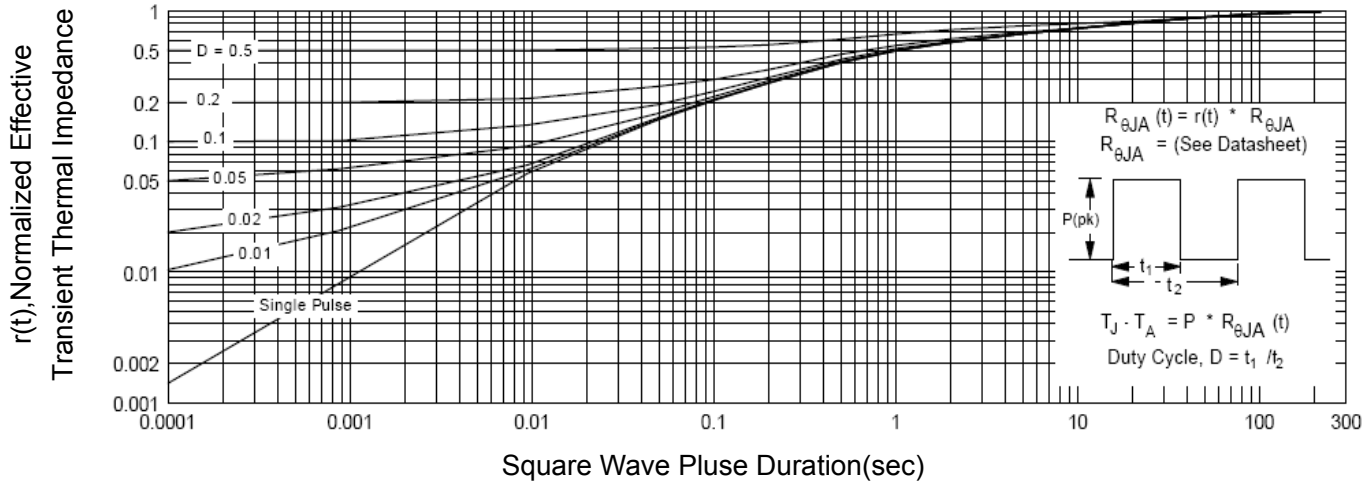
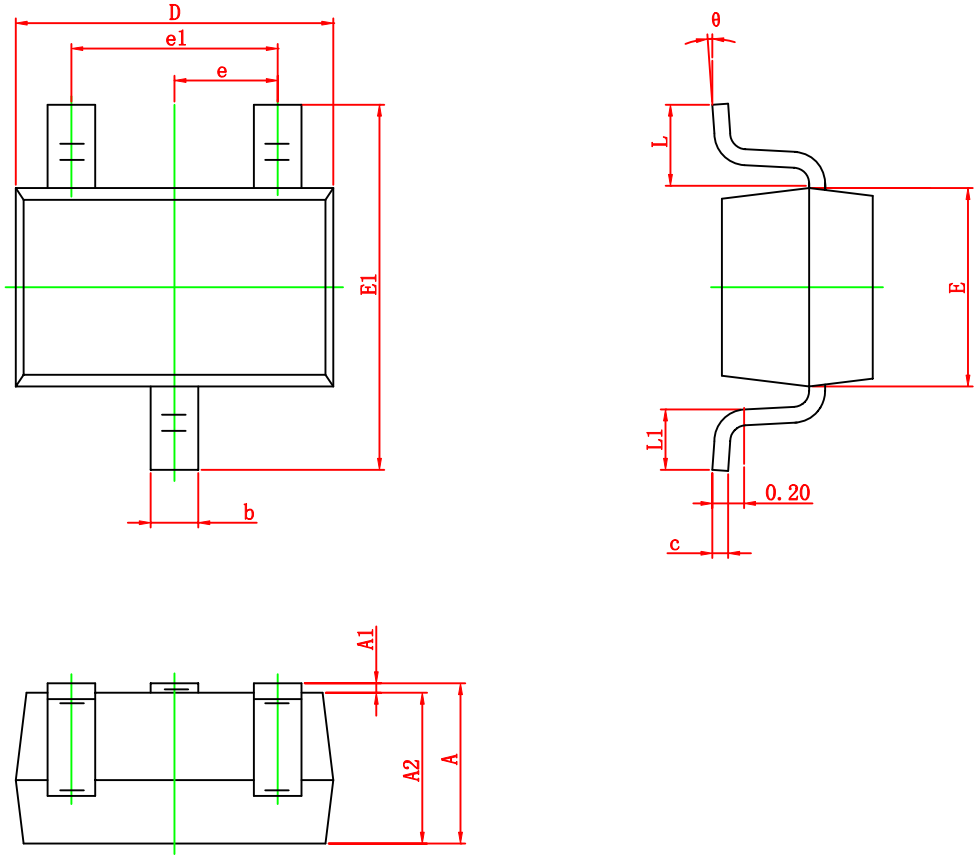


Figure 12 Normalized Maximum Transient Thermal Impedance

Package outline dimensions

SOT-323



Symbol	Dimensions in millimeter		
	Min.	Typ.	Max.
A	0.900	1.000	1.100
A1	0.000	0.050	0.100
A2	0.900	0.950	1.000
b	0.200	0.300	0.400
c	0.080	0.115	0.150
D	2.000	2.100	2.200
E	1.150	1.250	1.350
E1	2.150	2.300	2.450
e	0.650TYP		
e1	1.200	1.300	1.400
L	0.525REF		
L1	0.260		0.460
θ	0°		8°