

Features

Advanced trench cell design.
High speed switch.
G-S ESD Protected: $\pm 2000V$
Pb-Free Package is available.
We declare that the material of product compliance with
RoHS requirements and Halogen Free.

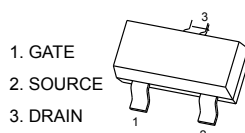
V_{DS} -60 V
 I_D -170 mA
 $R_{DS(ON)}$ 4.8 Ω

PD *

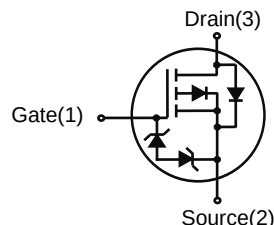
Applications

Portable appliances.
Load switch appliances.

SOT-23



Equivalent Circuit



MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

MAXIMUM RATINGS

Parameter	Symbol	Limits	Unit
Drain-Source Voltage	V_{DS}	-60	V
Gate-to-Source Voltage	V_{GS}	± 20	V
Drain Current			mA
– Continuous $T_A = 25^\circ C$	I_D	-170	
– Pulsed ($t_p \leq 10\mu s$)	I_{DM}	-520	

THERMAL CHARACTERISTICS

Parameter	Symbol	Limits	Unit
Total Device Dissipation, FR-5 Board (Note 1) @ $T_A = 25^\circ C$ Derate above $25^\circ C$	PD	225 1.8	mW mW/ $^\circ C$
Thermal Resistance, Junction-to-Ambient(Note 1)	$R_{\theta JA}$	556	$^\circ C/W$
Junction and Storage temperature	T_J, T_{stg}	$-55 \sim +150$	$^\circ C$
Maximum Lead Temperature for Soldering Purposes, for 10 seconds	TL	260	$^\circ C$

1. FR-5 = $1.0 \times 0.75 \times 0.062$ in.

Electrical Characteristics ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

OFF CHARACTERISTICS

Characteristic	Symbol	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage ($V_{GS} = 0$, $I_D = -250\mu\text{A}$)	V_{BRDSS}	-60	-	-	V
Zero Gate Voltage Drain Current ($V_{GS} = 0$, $V_{DS} = -25\text{ V}$) ($V_{GS} = 0$, $V_{DS} = -60\text{ V}$)	I_{DSS}	-	-	-0.1 -15	μA
Gate-Body Leakage Current, Forward ($V_{GS} = 20\text{ V}$)	I_{GSSF}	-	-	10	μA
Gate-Body Leakage Current, Reverse ($V_{GS} = -20\text{ V}$)	I_{GSSR}	-	-	-10	μA

ON CHARACTERISTICS (Note 2)

Gate Threshold Voltage ($V_{DS} = V_{GS}$, $I_D = -250\mu\text{A}$)	$V_{GS(th)}$	-1.0	-	-2.2	V
Static Drain-Source On-State Resistance ($V_{GS} = -4.5\text{ V}$, $I_D = -100\text{ mA}$) ($V_{GS} = -10\text{ V}$, $I_D = -100\text{ mA}$)	$R_{DS(on)}$	-	4.8 4	6.2 5.5	Ω
Transfer Admittance ($V_{DS} = -25\text{ V}$, $I_D = -100\text{ mA}$, $f = 1.0\text{ kHz}$)	$ y_{fs} $	50	-	-	mS

DYNAMIC CHARACTERISTICS

Input Capacitance ($V_{DS} = -25\text{ V}$, $V_{GS}=0\text{V}$, $f=1\text{MHz}$)	C_{iss}	-	28.6	-	pF
Output Capacitance ($V_{DS} = -25\text{ V}$, $V_{GS}=0\text{V}$, $f=1\text{MHz}$)	C_{oss}	-	4	-	pF
Reverse Transfer Capacitance ($V_{DS} = -25\text{ V}$, $V_{GS}=0\text{V}$, $f=1\text{MHz}$)	C_{rss}	-	2.45	-	pF
Total Gate Charge	(VDS = -25V, VGS = -4.5V, ID = -0.1A)	Q_g	-	1.1	nC
Gate-Source Charge		Q_{gs}	-	0.3	
Gate-Drain Charge		Q_{gd}	-	0.2	

SWITCHING CHARACTERISTICS

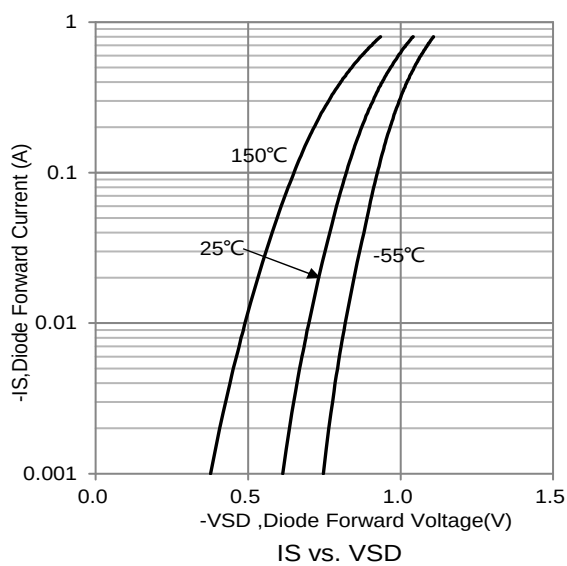
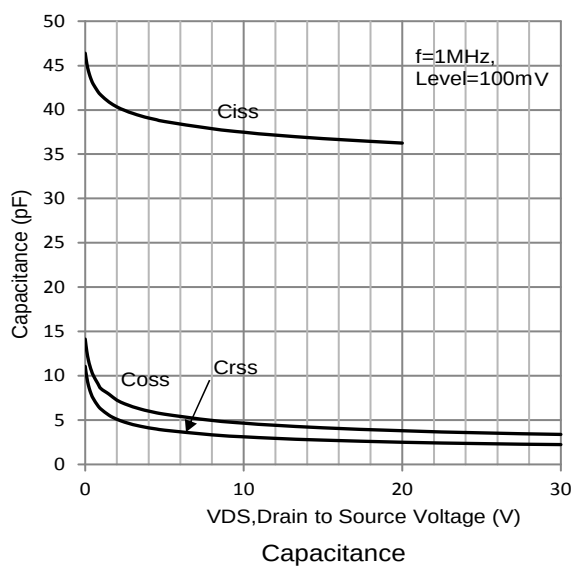
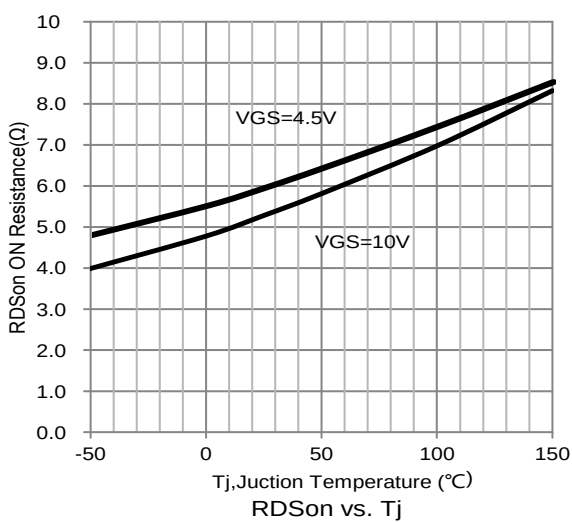
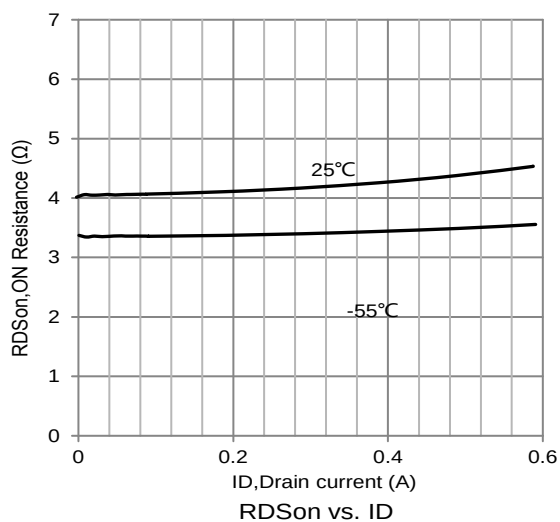
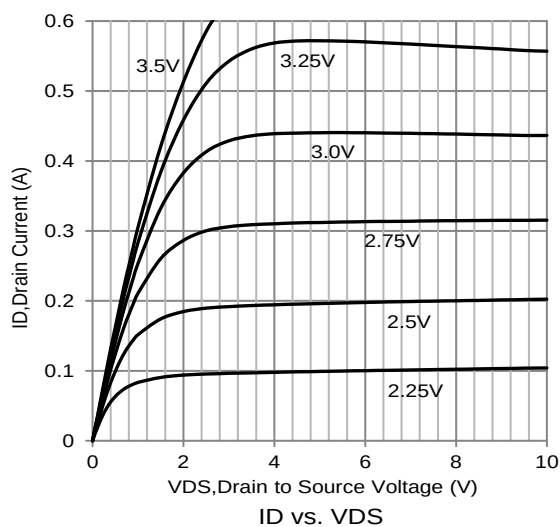
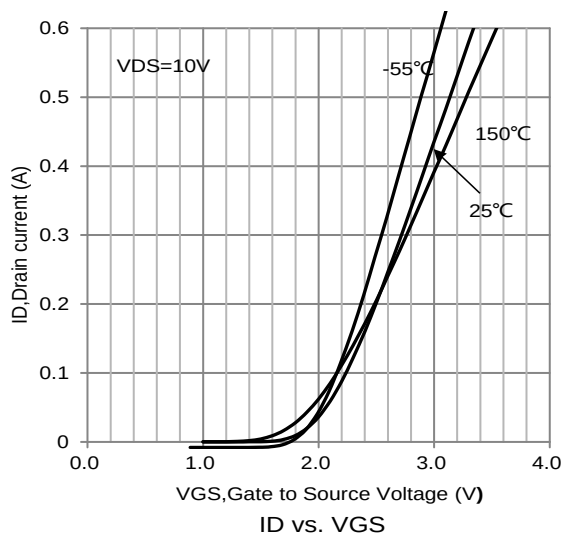
Turn-On Delay Time	(VDS = -25 V, VGEN = -10V, IDS = -0.1 A, RL = 250 Ω , RG=6 Ω)	$t_d(on)$	-	4.8	-	ns
Rise Time		t_r	-	19	-	
Turn-Off Delay Time		$t_d(off)$	-	52	-	
Fall Time		t_f	-	32	-	

SOURCE-DRAIN DIODE CHARACTERISTICS

Continuous Current	I_S	-	-	-0.17	A
Pulsed Current	I_{SM}	-	-	-0.52	A
Forward Voltage	V_{SD}	-	-2.2	-	V

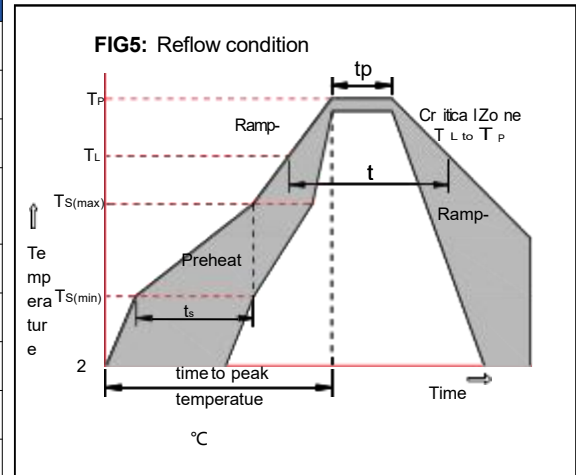
2. Pulse Test: Pulse Width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2.0\%$.

RATING AND CHARACTERISTIC CURVES



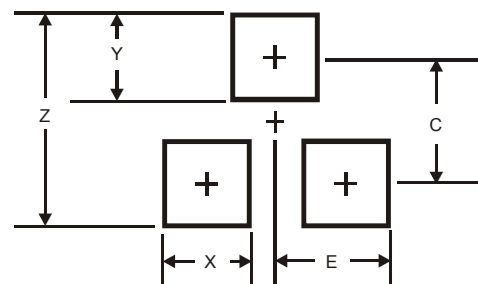
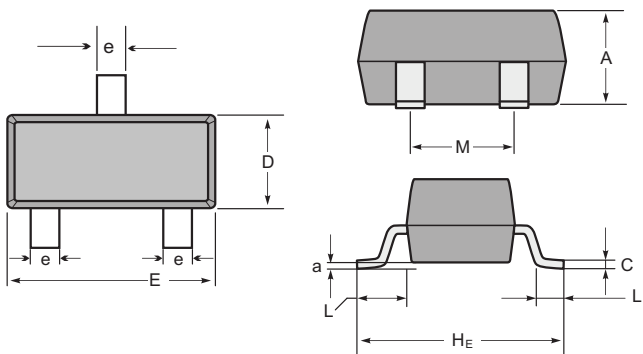
Soldering parameters

Reflow Condition		Pb-Free assembly (see as below)
Pre Heat	-Temperature Min ($T_{s(min)}$)	+150°C
	-Temperature Max($T_{s(max)}$)	+200°C
	-Time (Min to Max) (ts)	60-180 secs.
Average ramp up rate (Liquid us Temp (T_L) to peak)		3°C/sec. Max
$T_{s(max)}$ to T_L - Ramp-up Rate		3°C/sec. Max
Reflow	-Temperature(T_L)(Liquid us)	+217°C
	-Temperature(t_L)	60-150 secs.
Peak Temp (T_P)		+260(+0/-5)°C
Time within 5°C of actual Peak Temp (t_P)		30 secs. Max
Ramp-down Rate		6°C/sec. Max
Time 25°C to Peak Temp (T_P)		8 min. Max
Do not exceed		+260°C



Package Dimensions & Suggested Pad Layout

SOT23

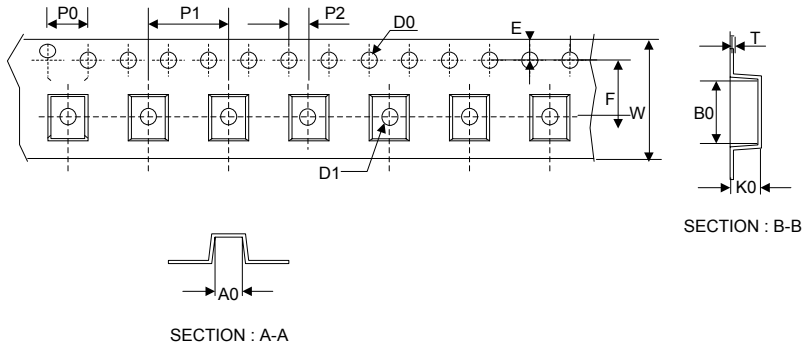
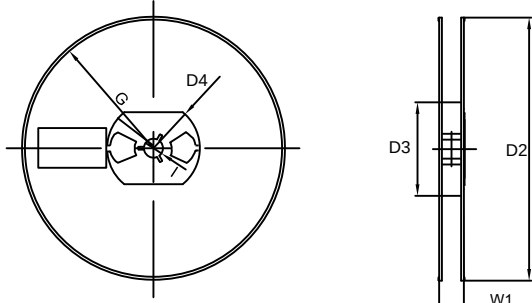


SOT-23 mechanical data

UNIT	A	C	D	E	H _E	e	M	L	L ₁	a
mm	max	1.1	0.15	1.4	3.0	2.6	0.5	1.95	0.55 (ref)	0.36 (ref)
	min	0.9	0.08	1.2	2.8	2.2	0.3	1.7		0.15
mil	max	43	6	55	118	102	20	77	22 (ref)	14 (ref)
	min	35	3	47	110	87	12	67		6

Dimensions	SOT23
Z	2.9
X	0.8
Y	0.9
C	2.0
E	1.35

Tape & reel specification

Tape		Symbol	Dimension (mm)
		P0	4.00±0.10
		P1	4.00±0.10
		P2	2.00±0.10
		D0	1.55±0.10
		D1	1.05±0.10
		E	1.55±0.10
		F	3.60±0.10
		W	8.00±0.10
		A0	3.80±0.20
		B0	3.25±0.20
		K0	1.45±0.10
		T	0.25±0.05
		D2	178.0±3.0
		D3	55Min.
7" Reel		D4	R24.0±3.0
		G	R82.0±3.0
		I	13.0±2.0
		W1	11.0±3.0
		Quantity: 3000PCS	