

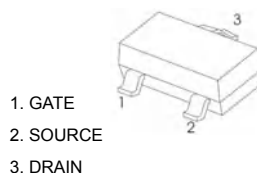
FEATURES

High density cell design for low $R_{DS(ON)}$
Voltage controlled small signal switch
Rugged and reliable
High saturation current capability

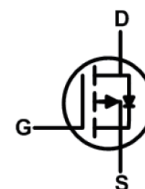
V_{DSS} -20 V
 I_D -3.7 A
 $R_{DS(ON)}$ 50 m Ω



SOT-23



Equivalent Circuit



MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Absolute Maximum Ratings

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	-20	V
Gate-Source Voltage	V_{GS}	± 12	
Continuous Drain Current $V_{GS}=4.5V$ @ $T_A=25^\circ C$	I_D	-3.7	A
Continuous Drain Current $V_{GS}=4.5V$ @ $T_A=70^\circ C$		-2.2	
Pulsed Drain Current a	I_{DM}	-30	
Power Dissipation @ $T_A=25^\circ C$	P_D	1.3	W
Power Dissipation @ $T_A=70^\circ C$		0.8	
Single Pulse Avalanche Energy b	E_{AS}	11	mJ
Thermal Resistance.Junction- to-Ambient	R_{thJA}	100	$^\circ C/W$
Linera Derating Factor		0.01	$W/^\circ C$
Junction Temperature	T_J	150	$^\circ C$
Junction and Storage Temperature Range	T_{stg}	-55 to 150	

Notes:

a.Repetitive Rating :Pulse width limited by maximum junction temperature

b.Starting $T_J=25^\circ C$, $L=1.65mH$, $R_G=25\Omega$, $I_{AS}=-3.7A$

Electrical Characteristics (T_J=25°C unless otherwise specified)

Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Drain-source Breakdown voltage	V _{DSS}	I _D = -250 μA, V _{GS} = 0V	-20			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = -20 V, V _{GS} = 0V			-1.0	μA
		V _{DS} = -20 V, V _{GS} = 0V, T _J =70°C			-25	
Gate-source leadage	I _{GSS}	V _{GS} = ±12V			±100	nA
Gate threshold voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = -250 μA	-0.40	-0.55	-0.95	V
Static drain-source on- resistance	R _{DS(on)}	I _D = -3.7A, V _{GS} = -4.5V		0.050	0.065	Ω
		I _D = -3.1A, V _{GS} = -2.5V		0.080	0.135	
Forward Transconductance	g _{fs}	V _{DS} = -10 V, I _D = -3.7 A	6.0			S
Input capacitance	C _{iss}	V _{DS} = -10 V,		633		pF
Output capacitance	C _{oss}	V _{GS} = 0 V,		145		
Reverse transfer capacitance	C _{rss}	f = 1MHz		110		
Total Gate Charge	Q _g	V _{DS} = -10V, V _{GS} = -5.0 V, I _D = -3.7 A		8.0	12	nC
Gate-Source Charge	Q _{gs}			1.2	1.8	
Gate-Drain Charge	Q _{gd}			2.8	4.2	
Turn-on delay time	t _{d(on)}	I _D = -3.7 A,		350		ns
Rise time	t _r	V _{DD} = -10 V,		48		
Turn-off delay time	t _{d(off)}	R _D = 2.7 Ω		588		
Fall time	t _f	R _G = 89 Ω		381		
Reverse recovery time	t _{rr}	T _J =25°C, I _F = -1.0 A,		29	43	ns
Reverse recovery charge	Q _{rr}	dI / dt = -100 A/μs *2		11	17	nC
Continuous source current	I _S	MOSFET symbol showing the integral reverse p-n junction diode			-1.3	A
Pulsed source current *1	I _{SM}				-22	
Diode forward voltage	V _{SD}	T _J =25°C, V _{GS} = 0 V, I _S = -1.0 A *2			-1.2	V

*1 Repetitive rating;pulse width limited by max.junction temperature.

* 2 Pulse width ≤ 400 μs, Duty cycle ≤ 2%

RATING AND CHARACTERISTIC CURVES

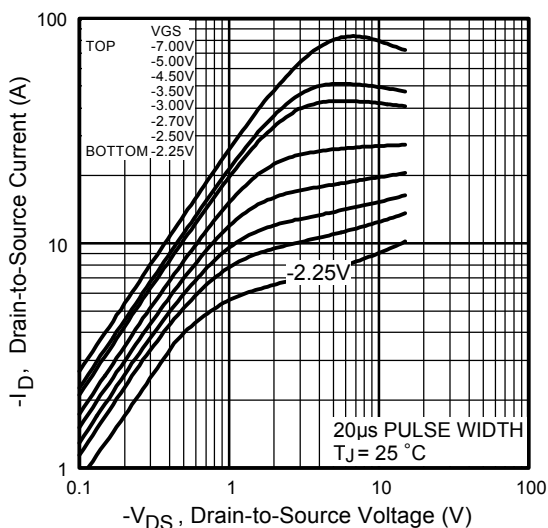


Fig 1. Typical Output Characteristics

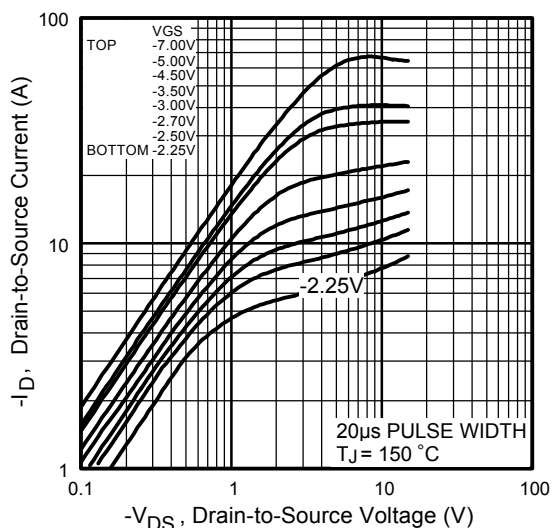


Fig 2. Typical Output Characteristics

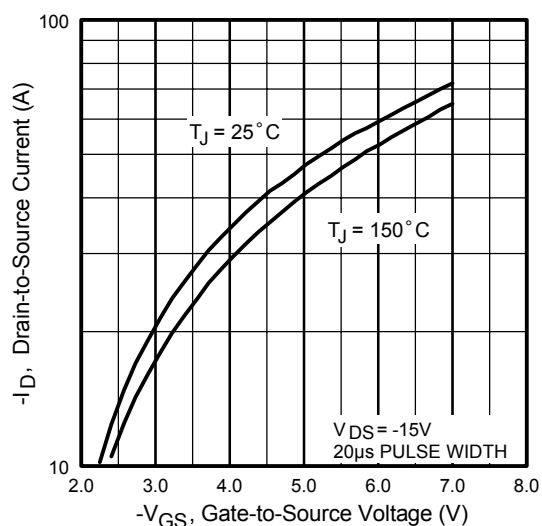


Fig 3. Typical Transfer Characteristics

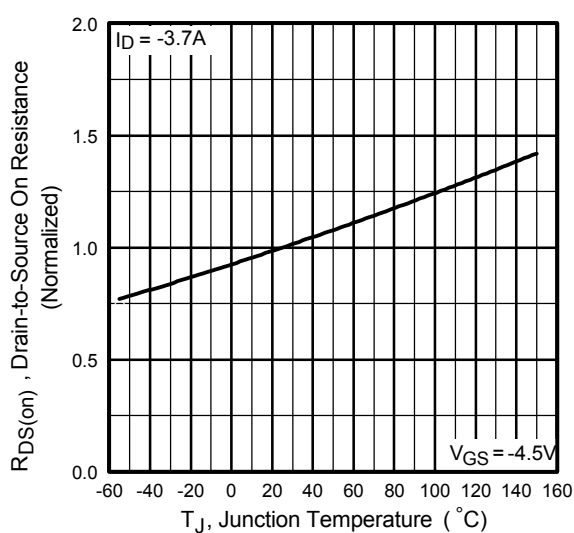


Fig 4. Normalized On-Resistance

RATING AND CHARACTERISTIC CURVES

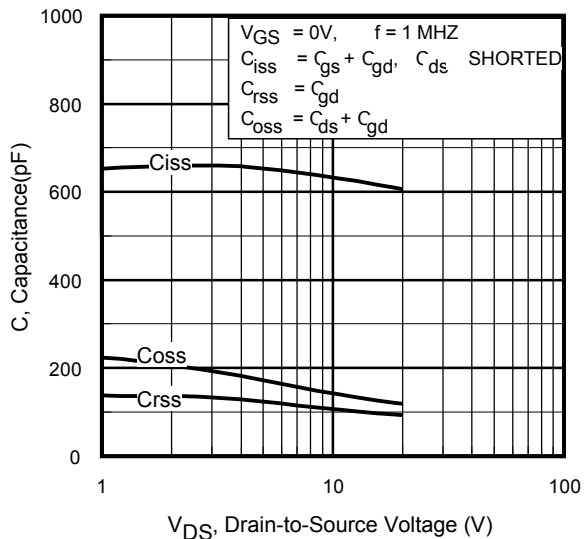


Fig 5. Typical Capacitance Vs. Drain-to-Source Voltage

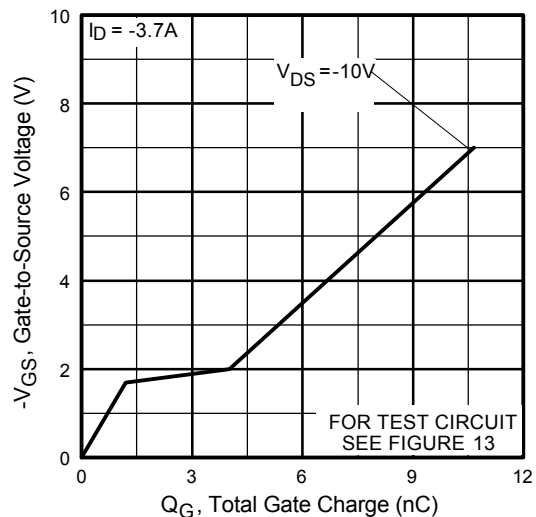


Fig 6. Typical Gate Charge Vs. Gate-to-Source Voltage

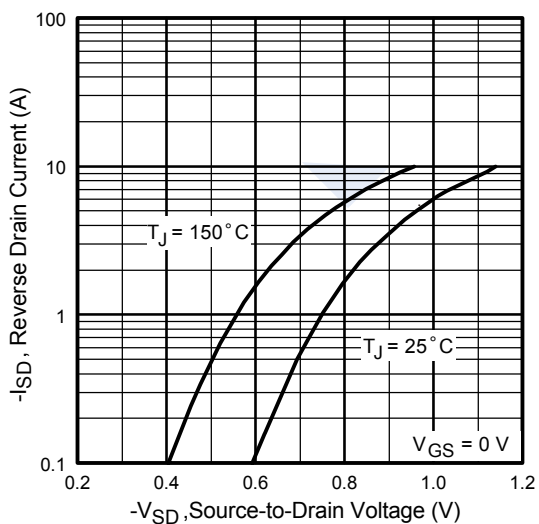


Fig 7. Typical Source-Drain Diode Forward Voltage

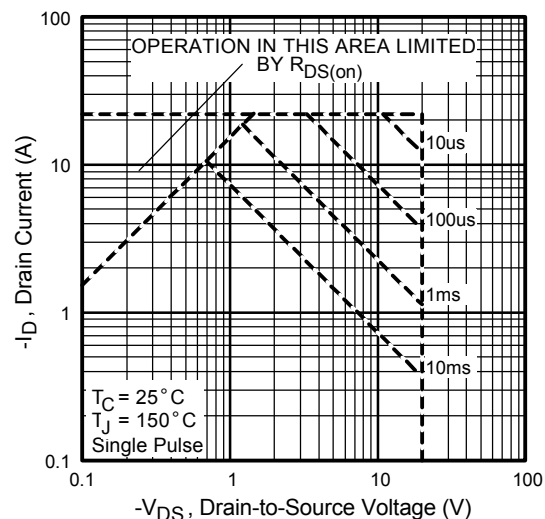


Fig 8. Maximum Safe Operating Area

RATING AND CHARACTERISTIC CURVES

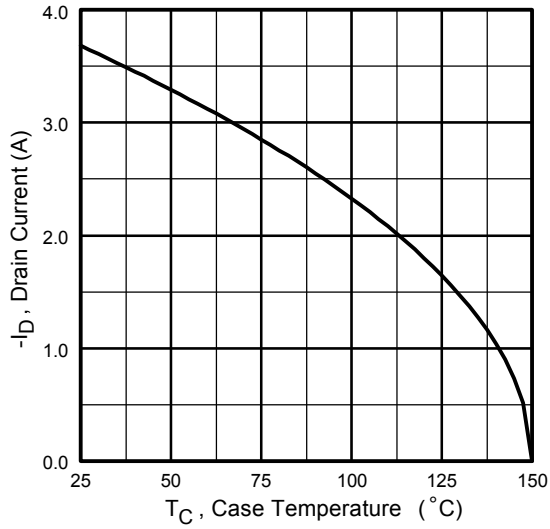


Fig 9. Maximum Drain Current Vs. Case Temperature

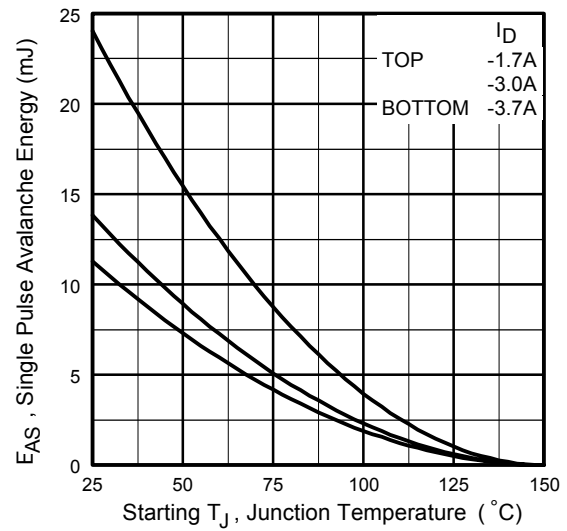


Fig 10. Maximum Avalanche Energy Vs. Drain Current

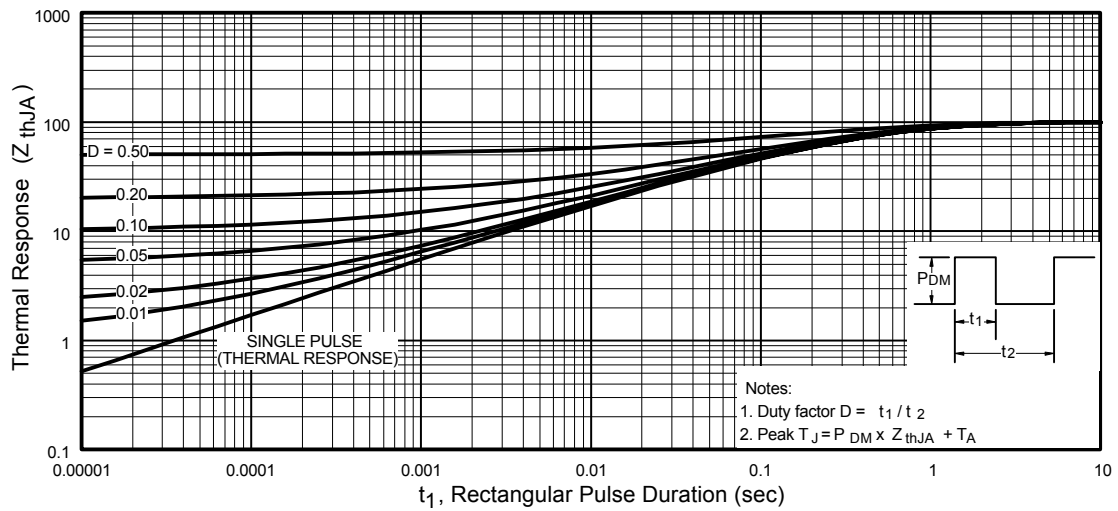


Fig 11. Maximum Effective Transient Thermal Impedance, Junction-to-Ambient

RATING AND CHARACTERISTIC CURVES

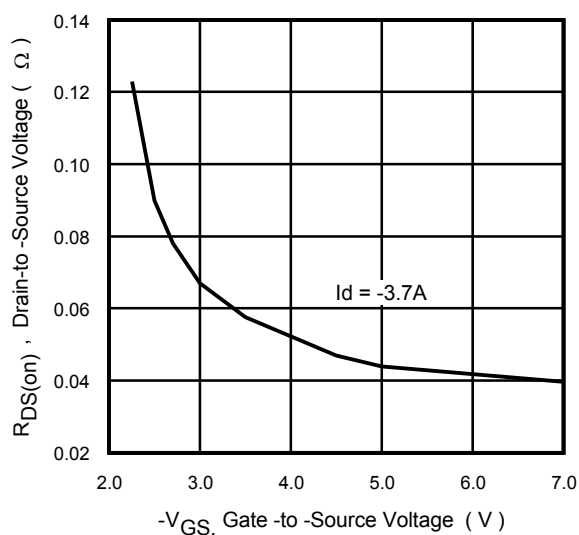


Fig 12. Typical On-Resistance Vs. Gate Voltage

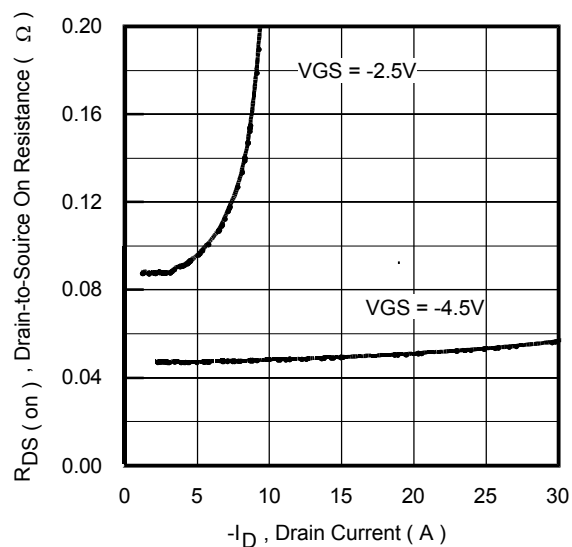
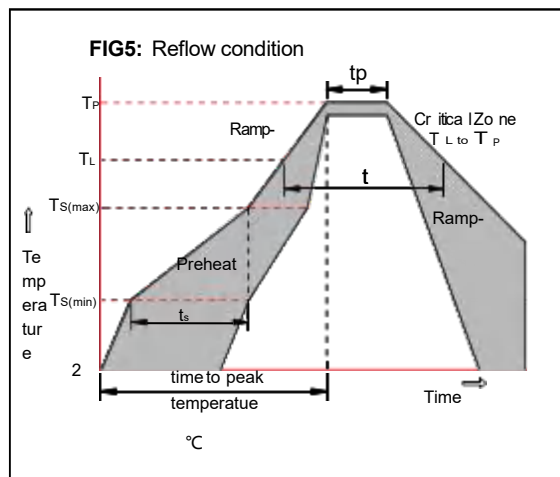


Fig 13. Typical On-Resistance Vs. Drain Current

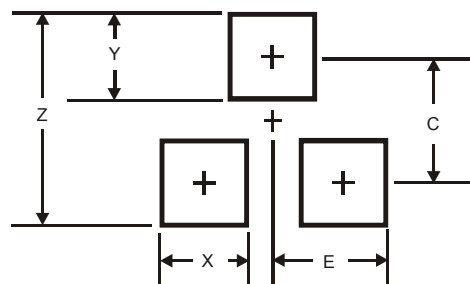
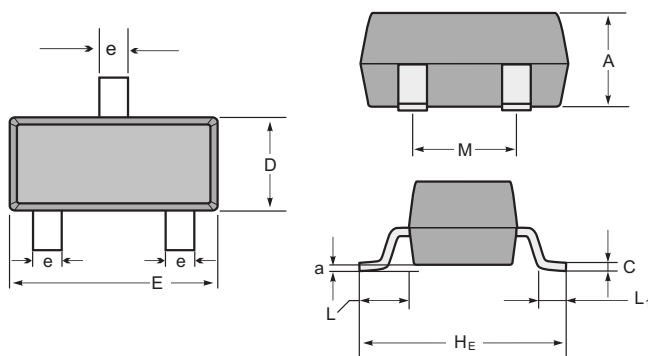
Soldering parameters

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)	0.0
	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)	0.0
	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

Technical drawing of a tape reel. The top view shows a rectangular reel with dimensions W (width) and E (height). The tape is wound in a series of loops, with dimensions P0, P2, and P1 indicating the pitch between loops. The tape has a width of F. The reel has a central hub with a diameter of ØD0 and a hole diameter of ØD1. The side view shows the tape thickness T, the reel thickness B0, and the tape width K0. The section A-A shows the tape profile with a width of A0. The section B-B shows the reel profile with a width of K0.

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.
D4	R24.0±3.0
G	R82.0±3.0
I	13.0±2.0
W1	11.0±3.0

Technical drawing of a 7 inch Reel. The top view shows a circular reel with a diameter of D4. The tape is wound in a series of loops, with dimensions G and I indicating the pitch between loops. The reel has a central hub with a diameter of ØD0 and a hole diameter of ØD1. The side view shows the tape thickness T, the reel thickness B0, and the tape width K0. The section A-A shows the tape profile with a width of A0. The section B-B shows the reel profile with a width of K0.

Quantity: 3000PCS