

SOT-23 Plastic-Encapsulate MOSFETS

N-Channel 20-V(D-S) MOSFET

FEATURE

- . TrenchFET Power MOSFET

APPLICATION

- . Load Switch for Portable Devices
- . DC/DC Converter

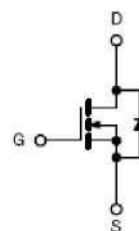
MARKING



SOT-23



Equivalent Circuit



$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
20V	60mΩ@4.5V	4.4A
	80mΩ@2.5V	

Maximum ratings ($T_A=25^{\circ}C$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	± 12	V
Continuous Drain Current	$I_D^{(5)}$	4.4	A
		2.9	
Pulsed Drain Current	$I_{DM}^{(1)(2)}$	15.2	A
Power Dissipation	$P_D^{(1)(5)}$	1.25	W
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55~+150	$^{\circ}C$
Thermal Resistance from Junction to Ambient $\leq$	$R_{\theta JA}$	100	$^{\circ}C/W$

MOSFET ELECTRICAL CHARACTERISTICS

Ta=25 °C unless otherwise specified

Parameter	Symbol	Test Condition	Min	Typ	Max	Units
Static						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 10\mu A$	20			V
Gate-threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 50\mu A$	0.40		1.20	
Gate-body leakage	I_{GSS}	$V_{DS} = 0V, V_{GS} = \pm 8V$			± 100	nA
Zero gate voltage drain current	I_{DSS}	$V_{DS} = 20V, V_{GS} = 0V$			1	μA
Drain-source on-resistance	$R_{DS(on)}$	$V_{GS} = 4.5V, I_D = 3.0A$		0.03	0.060	Ω
		$V_{GS} = 2.5V, I_D = 2.0A$		0.04	0.080	
Forward transconductance	g_{fs}	$V_{DS} = 5V, I_D = 3.6A$		8		S
Diode forward voltage	V_{SD}	$I_S = 0.94A, V_{GS} = 0V$			1.2	V
Dynamic						
Total gate charge	Q_g	$V_{DS} = 10V, V_{GS} = 4.5V, I_D = 4.0A$		4.7		nC
Gate-source charge	Q_{gs}			0.65		
Gate-drain charge	Q_{gd}			1.2		
Input capacitance	C_{iss}	$V_{DS} = 10V, V_{GS} = 0V, f = 1MHz$		470		pF
Output capacitance	C_{oss}			85		
Reverse transfer capacitance	C_{rss}			50		
Switching						
Turn-on delay time	$t_{d(on)}$	$V_{DD} = 10V,$ $R_L = 5.5\Omega, I_D \approx 4.0A$ $V_{GEN} = 4.5V, R_g = 6\Omega$		10		ns
Rise time	t_r			5		
Turn-off delay time	$t_{d(off)}$			36		
Fall time	t_f			9		

Reverse Diode Characteristics

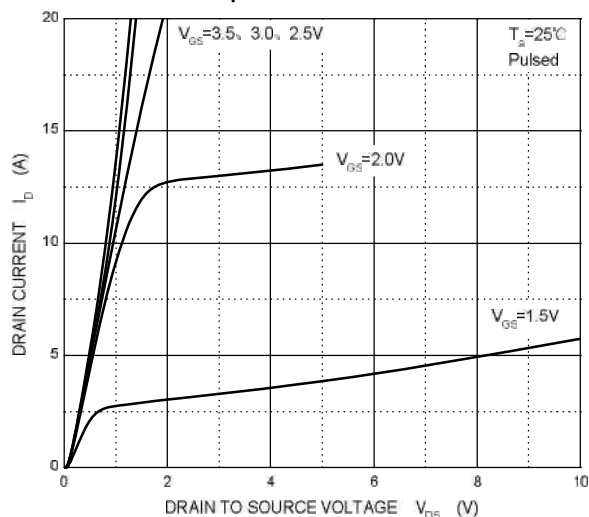
Drain-source diode forward voltage	$V_{SD}^{(3)}$	$V_{GS} = 0V, I_S = 0.94A$	-	-	1.2	V
Continuous drain-source diode forward current	$I_S^{(1)}$		-	-	3.8	A
Pulsed drain-source diode forward current	$I_{SM}^{(1)(2)}$		-	-	15.2	A

Notes:

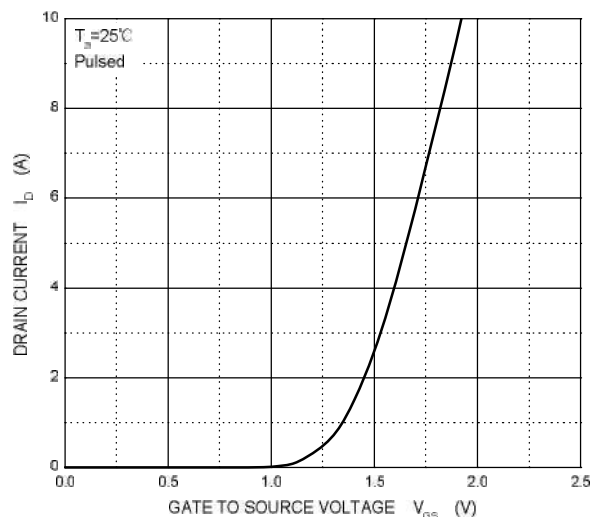
- ①. Limited only by maximum temperature allowed.
- ②. $P_W \leq 300\mu s$, Duty cycle $\leq 1\%$.
- ③. Pulse Test : Pulse Width $\leq 380\mu s$, duty cycle $\leq 2\%$.
- ④. Guaranteed by design, not subject to production.
- ⑤. Device mounted on 1 in² FR-4 board with 2oz. double-sided Copper, in a still air environment with $T_A = 25^\circ C$. The current rating is based on the $t \leq 10s$ thermal resistance rating.

Typical Characteristics

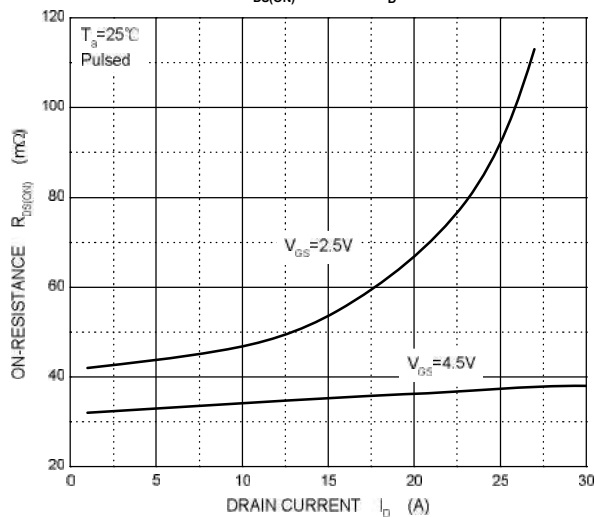
Output Characteristics



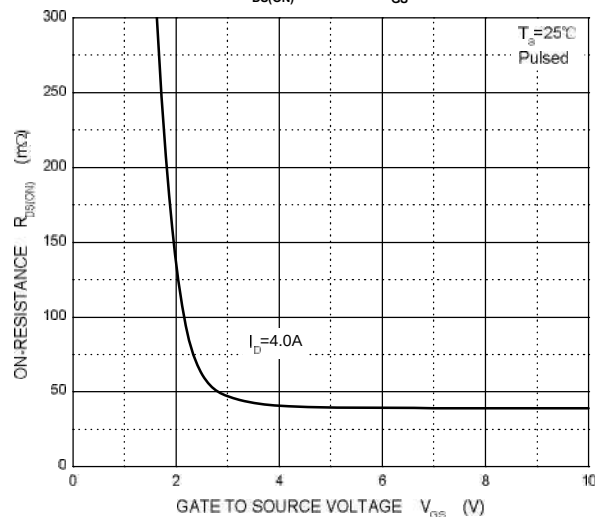
Transfer Characteristics



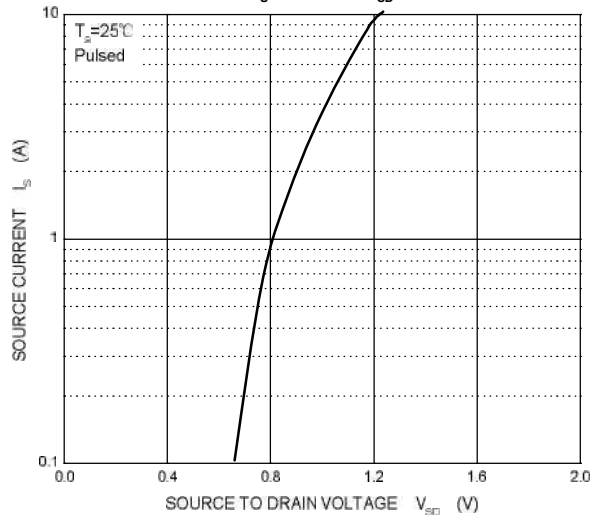
$R_{DS(ON)}$ — I_D



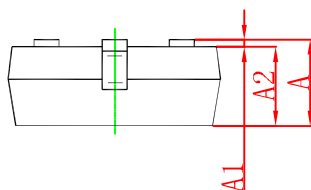
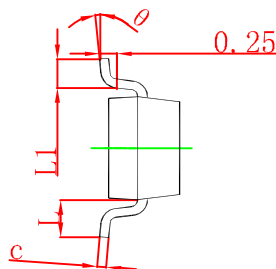
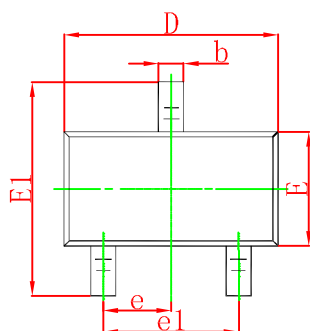
$R_{DS(ON)}$ — V_{GS}



I_S — V_{SD}

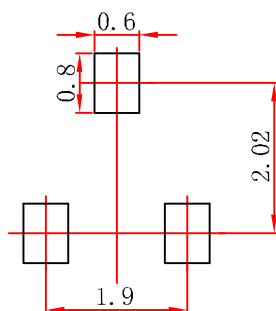


SOT-23 Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.150	0.035	0.045
A1	0.000	0.100	0.000	0.004
A2	0.900	1.050	0.035	0.041
b	0.300	0.500	0.012	0.020
c	0.080	0.150	0.003	0.006
D	2.800	3.000	0.110	0.118
E	1.200	1.400	0.047	0.055
E1	2.250	2.550	0.089	0.100
e	0.950 TYP		0.037 TYP	
e1	1.800	2.000	0.071	0.079
L	0.550 REF		0.022 REF	
L1	0.300	0.500	0.012	0.020
θ	0°	8°	0°	8°

SOT-23 Suggested Pad Layout

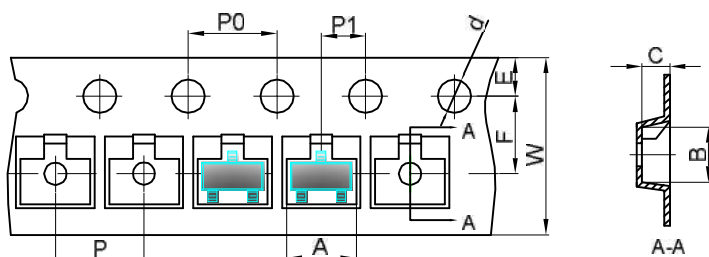


Note:

1. Controlling dimension: in millimeters.
2. General tolerance: $\pm 0.05\text{mm}$.
3. The pad layout is for reference purposes only.

SOT-23 Tape and reel

SOT-23 Embossed Carrier Tape

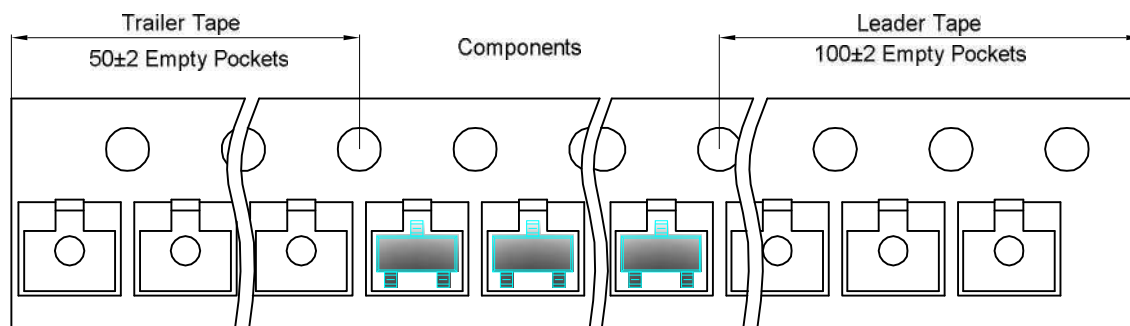


Packaging Description:

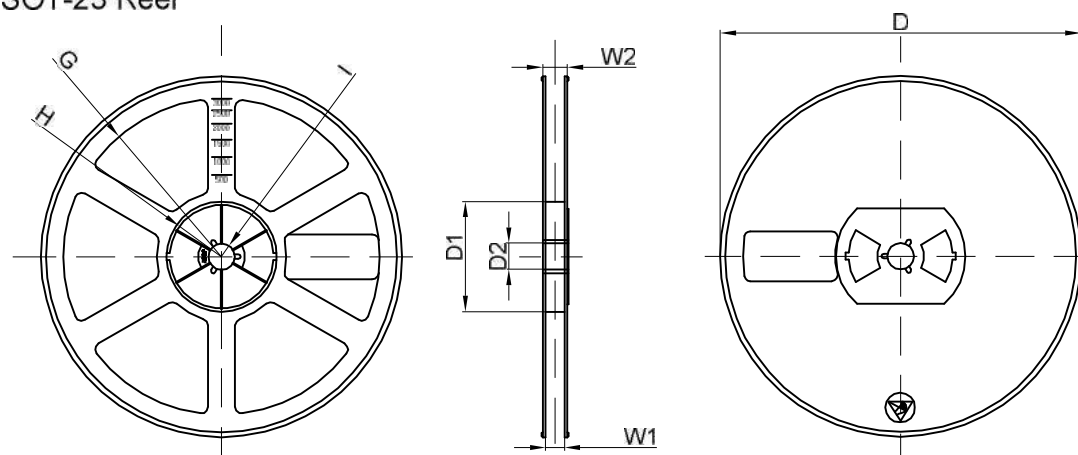
SOT-23 parts are shipped in tape. The carrier tape is made from a dissipative (carbon filled) polycarbonate resin. The cover tape is a multilayer film (Heat Activated Adhesive in nature) primarily composed of polyester film, adhesive layer, sealant, and anti-static sprayed agent. These reeled parts in standard option are shipped with 3,000 units per 7" or 17.8cm diameter reel. The reels are clear in color and is made of polystyrene plastic (anti-static coated).

Dimensions are in millimeter										
Pkg type	A	B	C	d	E	F	P0	P	P1	W
SOT-23	3.15	2.77	1.22	Ø1.50	1.75	3.50	4.00	4.00	2.00	8.00

SOT-23 Tape Leader and Trailer



SOT-23 Reel



Dimensions are in millimeter								
Reel Option	D	D1	D2	G	H	I	W1	W2
7"Dia	Ø178.00	54.40	13.00	R78.00	R25.60	R6.50	9.50	12.30

REEL	Reel Size	Box	Box Size(mm)	Carton	Carton Size(mm)	G.W.(kg)
3000 pcs	7 inch	30,000 pcs	203×203×195	120,000 pcs	438×438×220	