

1.Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
-20V	600mΩ@-4.5V	-0.66A
	850mΩ@-2.5V	

2.Features

- V_{DS} -20V
- I_D -0.66A
- $R_{DS(ON)}$ (at $V_{GS}=-4.5V$) <850 mohm
- $R_{DS(ON)}$ (at $V_{GS}=-2.5V$) <1200 mohm
- $R_{DS(ON)}$ (at $V_{GS}=-1.8V$) <2000 mohm
- ESD Protected Up to 2.0KV (HBM)

3.Applications

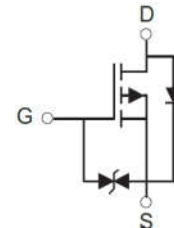
- Interfacing, Logic switch
- Load switch
- Power management

SOT-523

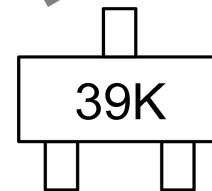


PIN1:GATE
PIN2:SOURCE
PIN3:DRAIN

Schematic diagram



Marking



4.Absolute Maximum rating ($T_A = 25^{\circ}C$ unless otherwise noted)

Parameter		Symbol	Value	Unit
Drain - Source Voltage		V_{DS}	-20	V
Gate - Source Voltage		V_{GS}	±12	V
Continuous Drain Current ¹	$T_C = 25^{\circ}C$	I_D	-0.66	A
Continuous Drain Current ²	$T_A = 75^{\circ}C$		-0.52	A
Pulsed Drain Current ³		I_{DM}	-2	A
Power Dissipation		P_D	150	mW
Thermal Resistance from Junction to Ambient ²		$R_{\theta JA}$	833	$^{\circ}C/W$
Junction Temperature		T_J	150	$^{\circ}C$
Storage Temperature		T_{STG}	-55~ +150	$^{\circ}C$

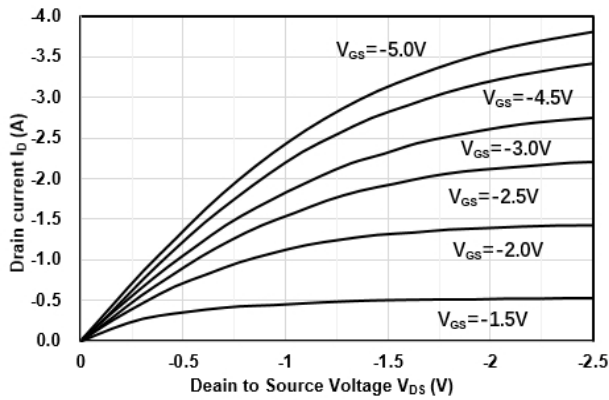
5. Electrical Characteristics ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Static 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 Current	I_{GSS}	$V_{GS} = \pm 12V, V_{DS} = 0V$			± 10	μA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\mu A$	-0.35	-0.65	-1	V
Drain-source On-resistance	$R_{DS(on)}$	$V_{GS} = -4.5V, I_D = -0.5A$		600	800	m Ω
		$V_{GS} = -2.5V, I_D = -0.3A$		850	1200	
		$V_{GS} = -1.8V, I_D = -0.2A$		1300	2000	
Dynamic Characteristics						
Input Capacitance	C_{iss}	$V_{DS} = -10V, V_{GS} = 0V, f = 1MHz$		71		pF
Output Capacitance	C_{oss}			20		
Reverse Transfer Capacitance	C_{rss}			15		
Gate Resistance	R_g	$f = 1MHz, \text{Open Drain}$		85		Ω
Switching Characteristics						
Total Gate Charge	Q_g	$V_{GS} = -4.5V, V_{DD} = -10V, I_D = -0.5A$		1.24		nC
Gate-source Charge	Q_{gs}			0.37		
Gate-drain Charge	Q_{gd}			0.27		
Turn-on Delay Time	$t_{d(on)}$	$V_{GS} = -4.5V, V_{DD} = -10V, R_L = 2.5\Omega, R_{GEN} = 3\Omega$		4		ns
Turn-on Rise Time	t_r			19		
Turn-off Delay Time	$t_{d(off)}$			16		
Turn-off Fall Time	t_f			25		
Source - Drain Diode Characteristics						
Diode Forward Voltage	V_{SD}	$V_{GS} = 0V, I_S = -0.65A$			-1.2	V

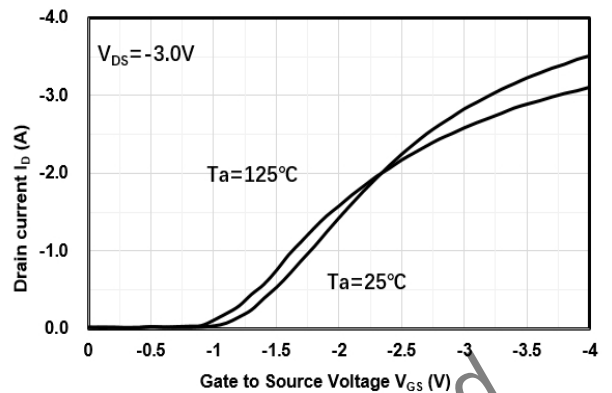
Notes :

1. The maximum current rating is limited by package. And device mounted on a large heat sink
2. Device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with $T_A = 25^\circ\text{C}$
3. Pulse Test : Pulse Width $\leq 10\mu s$, duty cycle $\leq 1\%$

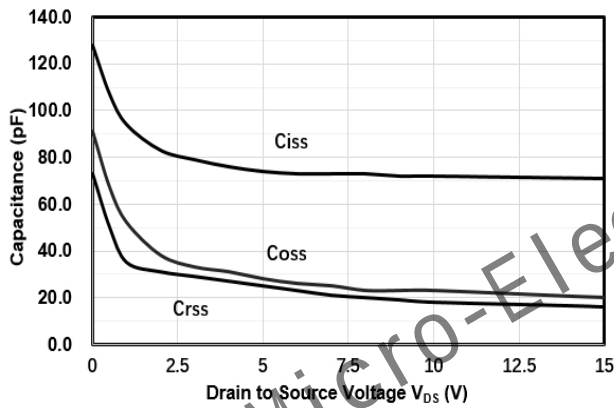
6. Typical Characteristic



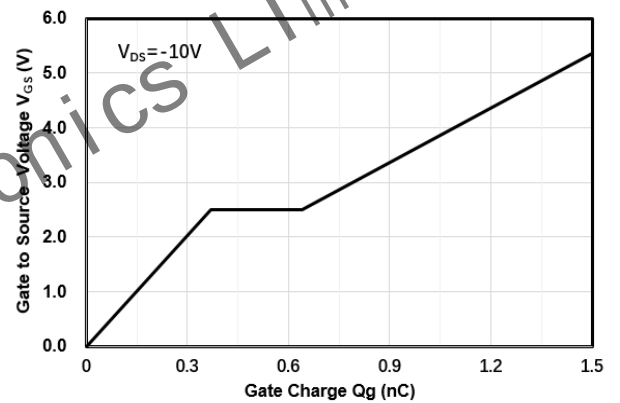
Output Characteristics



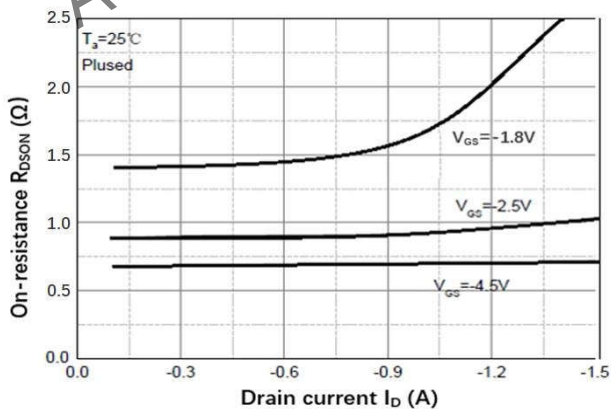
Transfer Characteristics



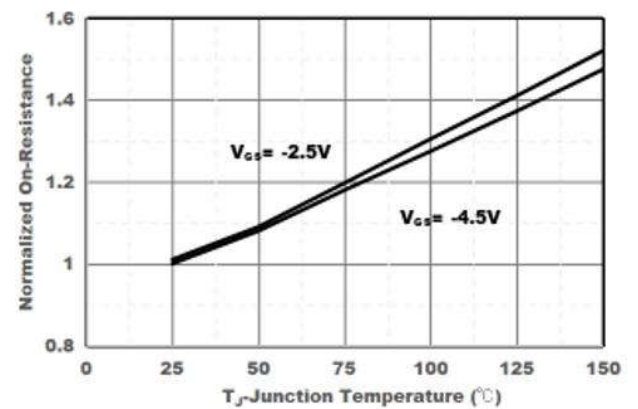
Capacitance Characteristics



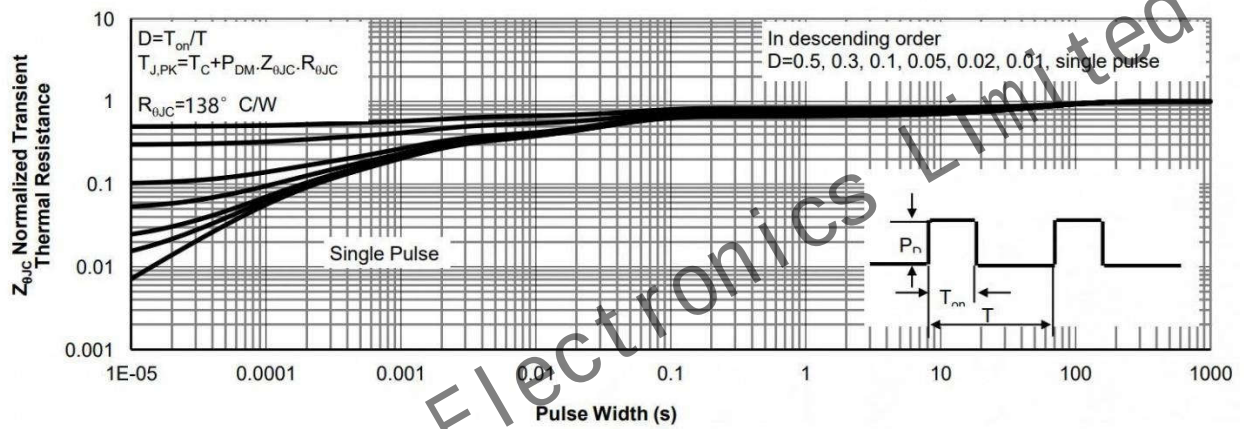
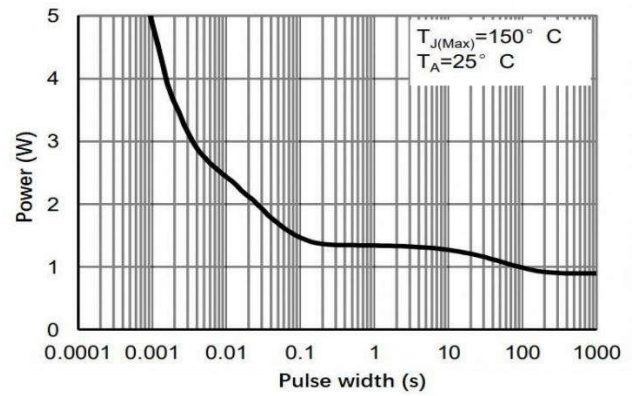
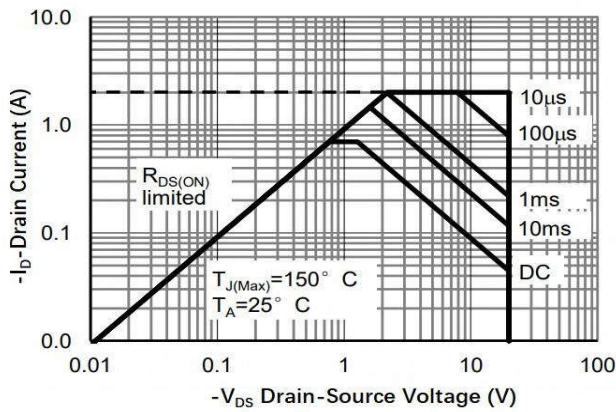
Gate Charge



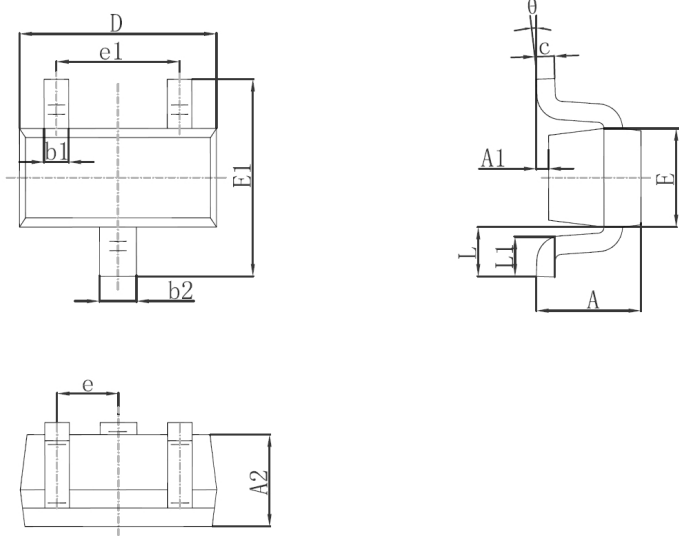
Drain-Source on Resistance



Drain-Source on Resistance

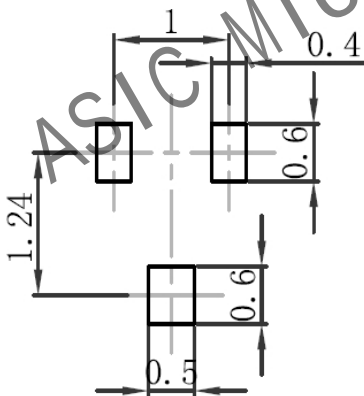


7.Dimension



Symbol	Millimeters		Inches	
	Min	Max	Min	Max
A	0.700	0.900	0.028	0.035
A1	0.000	0.100	0.000	0.004
A2	0.700	0.800	0.028	0.031
b1	0.150	0.250	0.006	0.010
b2	0.250	0.350	0.010	0.014
c	0.100	0.200	0.004	0.008
D	1.500	1.700	0.059	0.067
E	0.700	0.900	0.028	0.035
E1	1.450	1.750	0.057	0.069
e	0.500 TYP.		0.020 TYP.	
e1	0.900	1.100	0.035	0.043
L	0.400 REF.		0.016 REF.	
L1	0.260	0.460	0.010	0.018
θ	0°	8°	0°	8°

8.Recommended Land Pattern

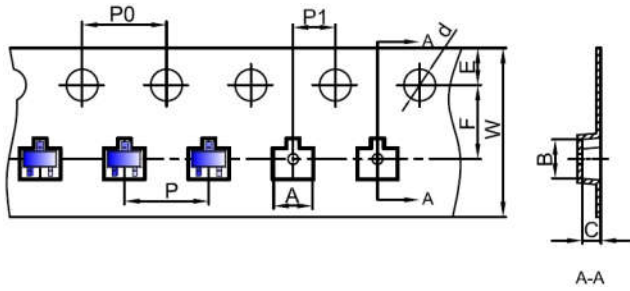


Note:

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

9.Tape and Reel

SOT-523 Embossed Carrier Tape

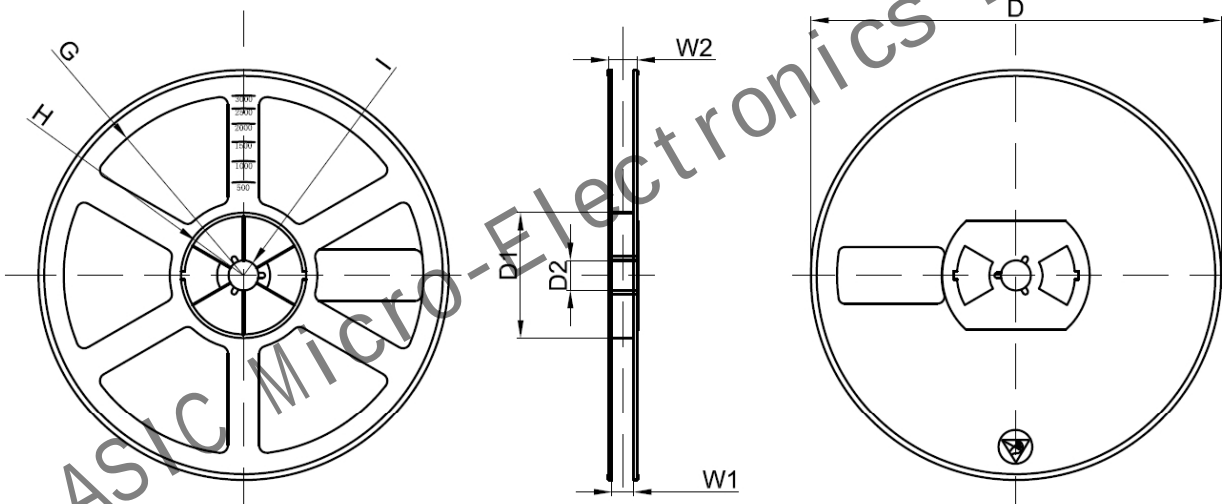


Packaging Description:

SOT-523 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-523	1.85	1.85	0.875	Ø1.50	1.75	3.50	4.00	4.00	2.00	8.00

SOT-523 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	45,000 pcs	203×203×195	180,000 pcs	438×438×220	

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