

SOT-523 Plastic-Encapsulate Mosfets

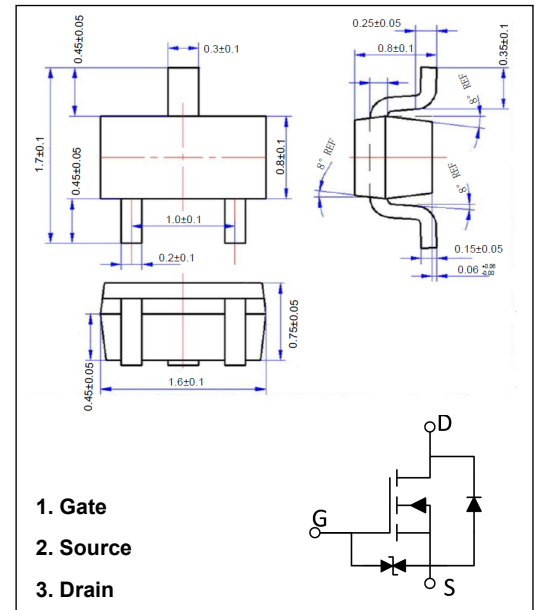
2N7002T

N-Channel Mosfet

Features

- High density cell design for low $R_{DS(ON)}$
- Voltage controlled small signal switch
- Rugged and reliable
- High saturation current capability
- ESD protected up to 2KV

Marking: K72



Maximum Ratings ($T_a=25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter	Value	Unit
V_{DS}	Drain-Source voltage	60	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Drain Current	115	mA
P_D	Power Dissipation	150	mW
$R_{\theta JA}$	Thermal Resistance from Junction to Ambient	833	$^\circ\text{C/W}$
T_J	Junction Temperature	150	$^\circ\text{C}$
T_{STG}	Storage Temperature	-55 to +150	$^\circ\text{C}$

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

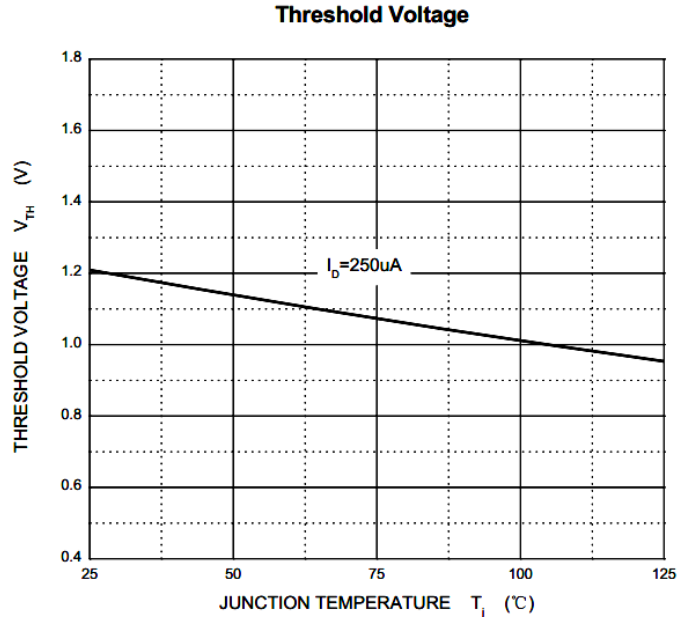
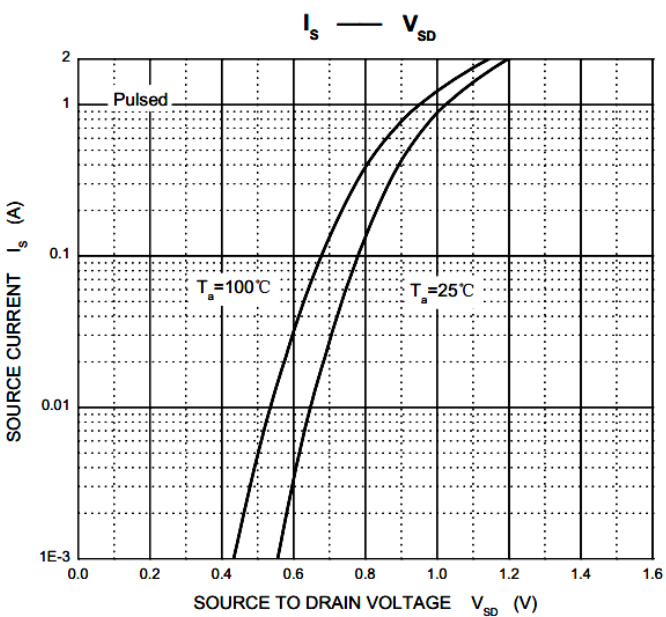
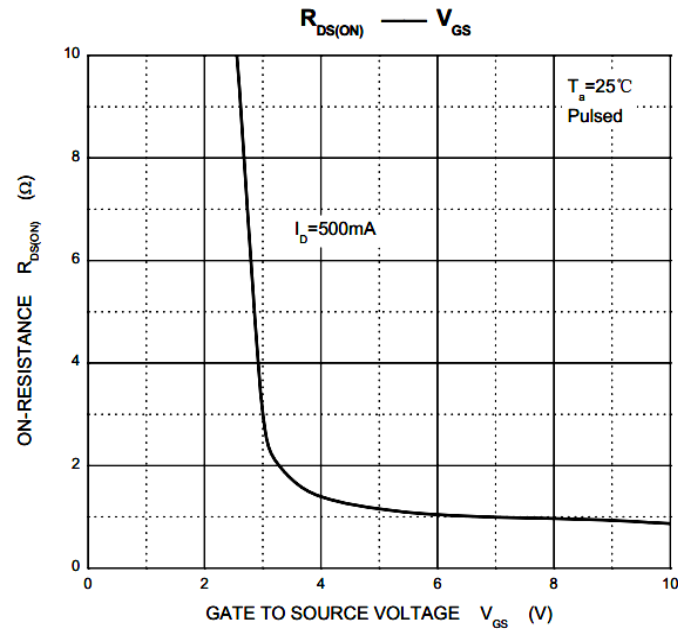
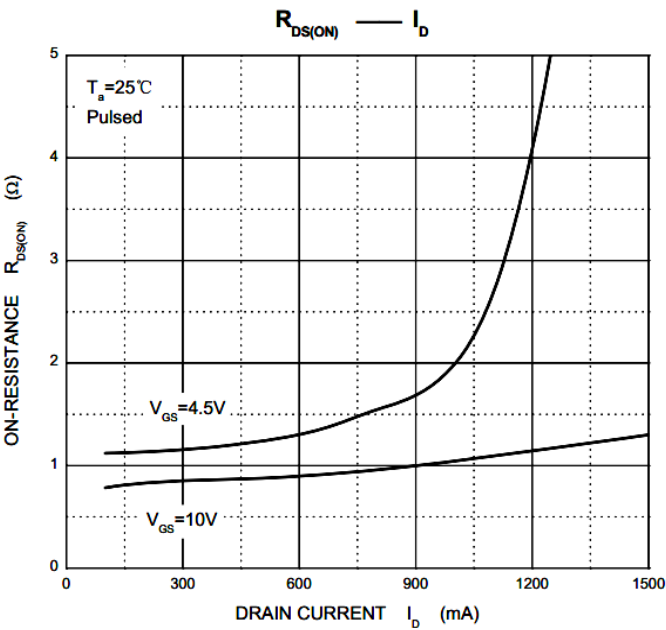
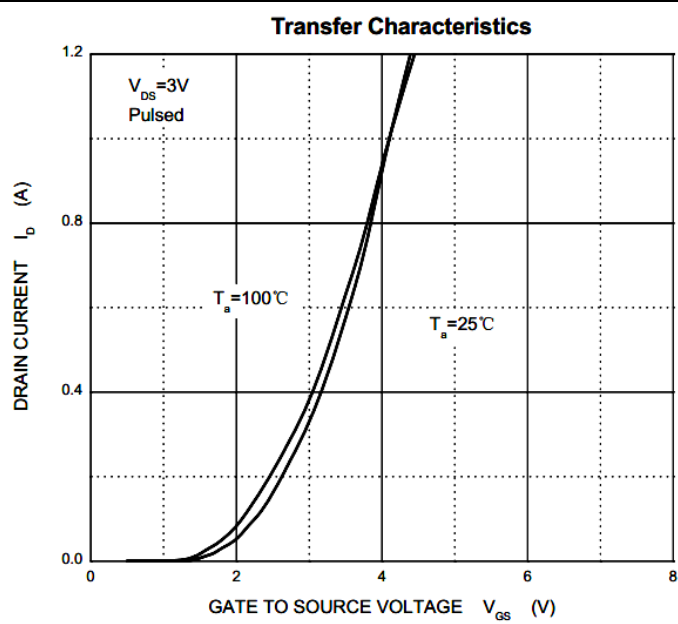
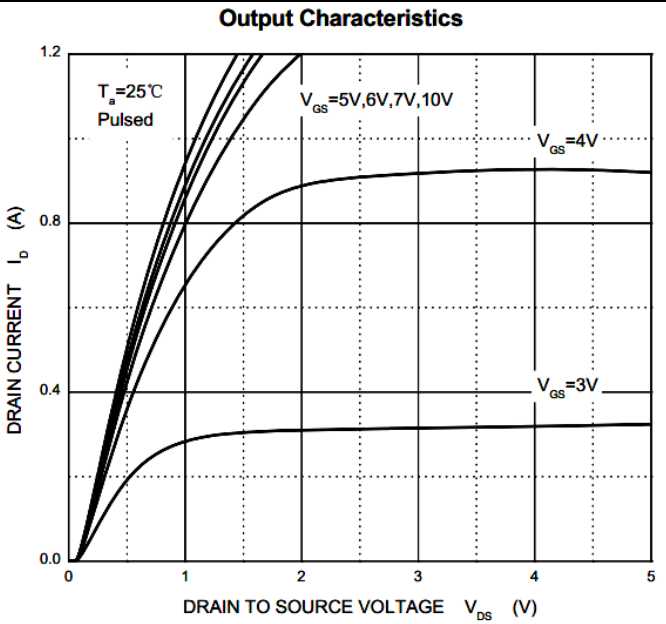
Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
Static Characteristics						
V _{(BR)DSS}	Drain-Source Breakdown Voltage	V _{GS} = 0V, I _D = 250μA	60			V
V _{GS(th)}	Gate-Threshold Voltage*	V _{DS} = V _{GS} , I _D = 250μA	1	1.3	2.5	V
I _{GSS}	Gate –Source leakage current	V _{DS} = 0V, V _{GS} = ±20V			±10	μA
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = 60V, V _{GS} = 0V			1	μA
R _{DS(on)}	Drain-Source On-Resistance*	V _{GS} = 4.5V, I _D =200mA		2.1	5.3	Ω
		V _{GS} =10V, I _D = 500mA		1.7	5.0	
V _{SD}	Drain-Source Diode Forward Voltage	V _{GS} = 0V, I _S = 300mA	0.55		1.5	V
g _{fs}	Forward Trans conductance	V _{DS} =10 V, I _D =200mA	80			ms
V _{DS(on)}	Drain-source on-voltage	V _{GS} = 10V, I _D = 500mA			3.75	V
		V _{GS} =5 V, I _D =50mA			0.375	
Q _r	Recovered charge	V _{GS} = 0V, I _S = 300mA, V _R = 25V, dI _S /dI _t = -100A/μS		30		nC
Dynamic Characteristics**						
C _{iss}	Input Capacitance*	V _{GS} = 0V V _{DS} = 10V f = 1.0MHz			40	pF
C _{oss}	Output Capacitance*				30	
C _{rss}	Reverse Transfer Capacitance*				10	
Switching Characteristics**						
t _{d(on)}	Turn-On Time	V _{DD} =25V, V _{GEN} =10V, R _G =25Ω, R _L =50Ω, I _D =500mA			20	ns
t _{d(off)}	Turn-Off Time				40	
t _{rr}	Reverse recovery Time	V _{GS} =0V, I _S =300mA, V _R =25V, dI _S /dI _t =-100A/μS		30		
BV _{GSO}	Gate-Source Breakdown Voltage	I _{gs} = ±1mA (Open Drain)	±21.5		±30	V

Notes:

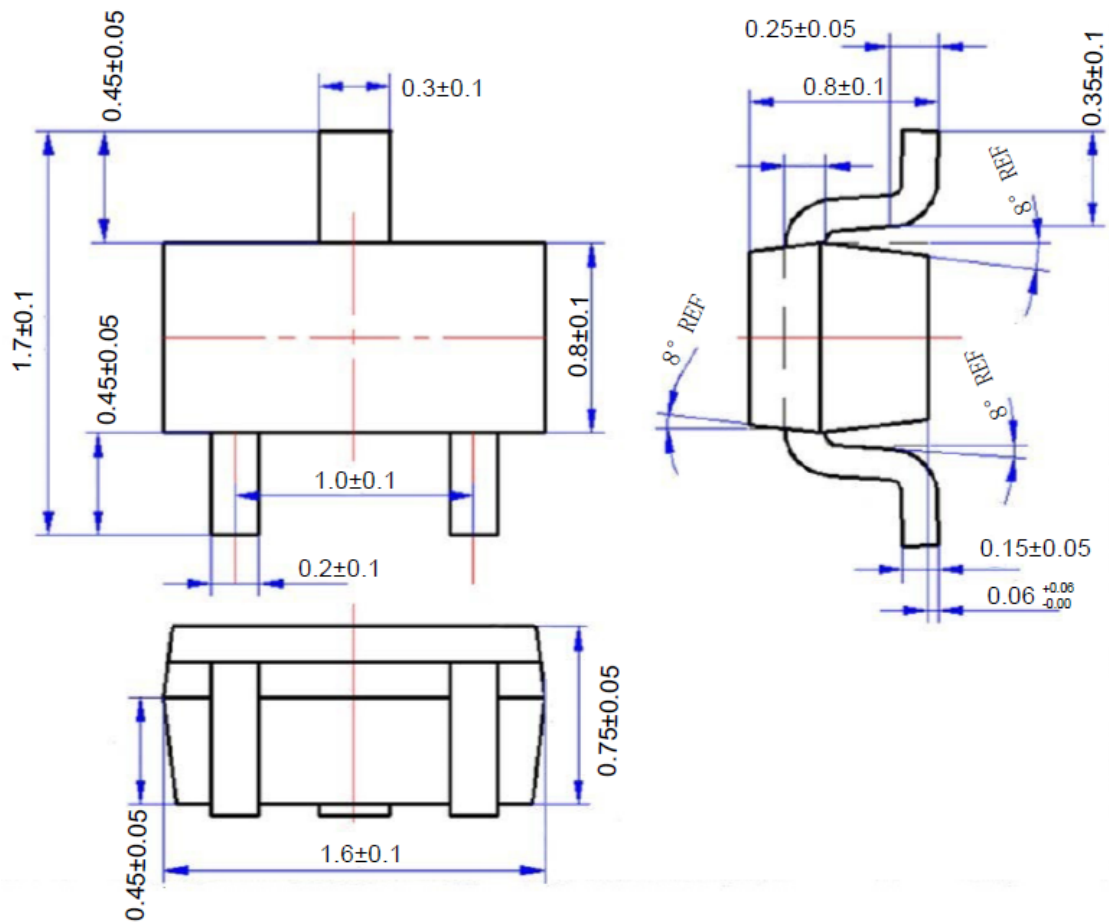
*Pulse Test: Pulse Width ≤300μs, Duty Cycle ≤2%.

**These parameters have no way to verify.

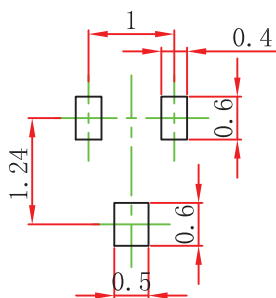
Typical Characteristics



SOT-523 Package Outline Dimensions



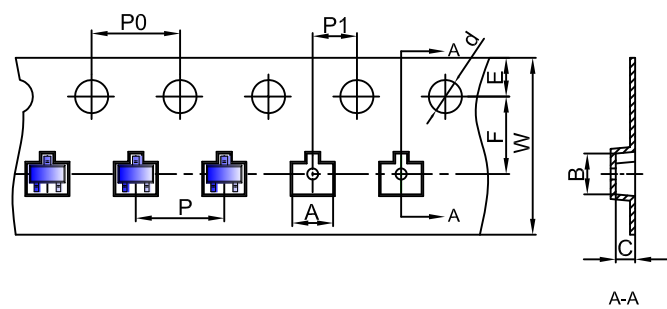
SOT-523 Suggested Pad Layout



Note:

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

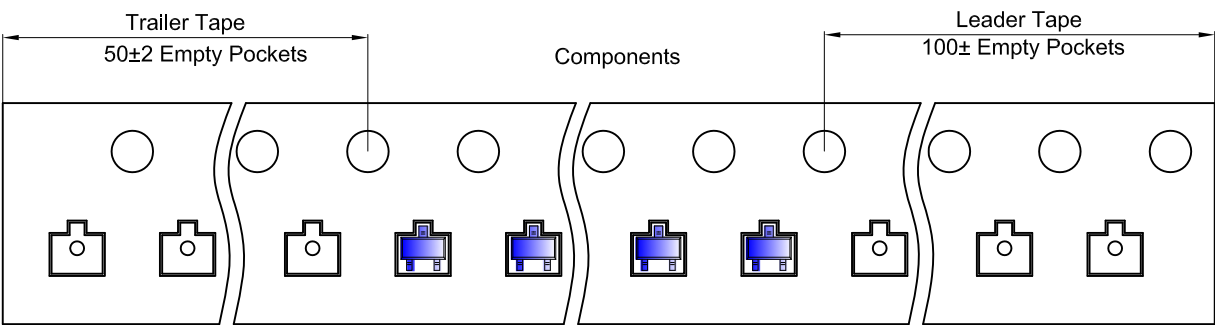
SOT-523 Embossed Carrier Tape



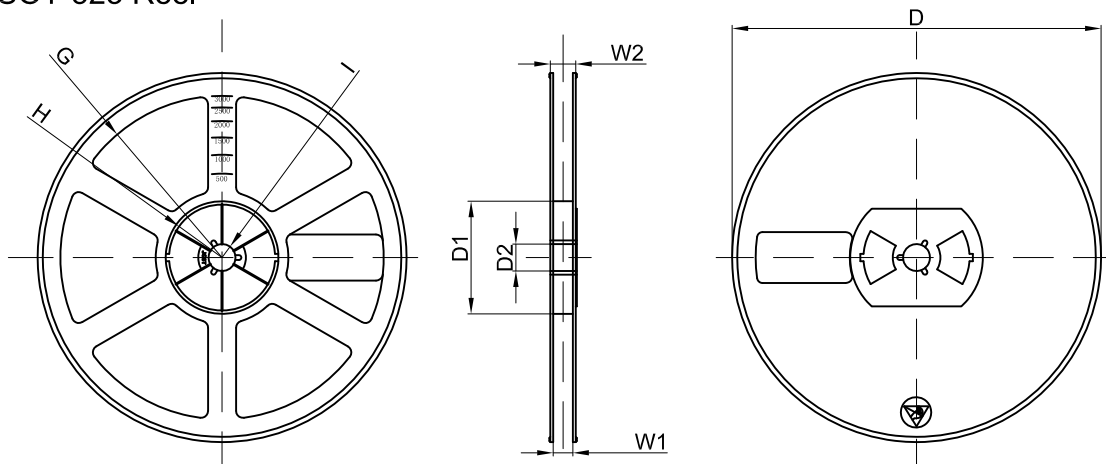
Packaging Description:
SOT-523 parts are shipped in tape. The carrier tape is made from a dissipative (carbon filled) polycarbonate resin. The cover tape is a multilayer film (Heat Activated Adhesive in nature) primarily composed of polyester film, adhesive layer, sealant, and anti-static sprayed agent. 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 ± 0.1	1.85 ± 0.1	0.875 ± 0.1	Ø1.50 ± 0.05	1.75 ± 0.1	3.50 ± 0.05	4.00 ± 0.1	4.00 ± 0.1	2.00 ± 0.05	8.00 ± 0.1

SOT-523 Tape Leader and Trailer



SOT-523 Reel



Dimensions are in millimeter								
Reel Option	D	D1	D2	G	H	I	W1	W2
7"Dia	Ø178.00 ± 0.1	54.40 ± 0.1	13.00 ± 0.05	R78.00 ± 0.1	R25.60 ± 0.1	R6.50 ± 0.05	9.50 ± 0.1	12.30 ± 0.1

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	

Soldering Parameters

Reflow Condition		Pb – Free assembly
Pre Heat	Temperature Min ($T_{s(min)}$)	150°C
	Temperature Max ($T_{s(max)}$)	200°C
	Time (min to max) (t_s)	60 – 190 secs
Average ramp up rate (Liquidus Temp) (T_L) to peak		5°C/second max
		5°C/second max
Reflow	Temperature (T_L) (Liquidus)	217°C
	Temperature (t_L)	60 – 150 seconds
		260+0/-5 °C
Time within actual peak Temperature (t_p)		20 – 40 seconds
Ramp-down Rate		5°C/second max
Time 25°C to peak Temperature (T_P)		8 minutes Max.
Do not exceed		280°C

