

General Description



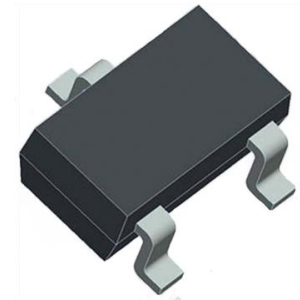
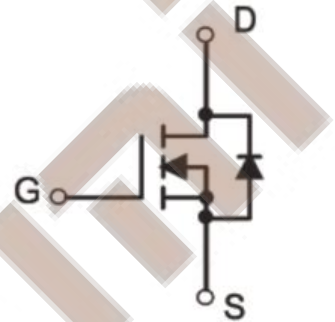
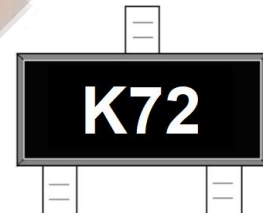
V_R	$R_{DS(ON) MAX}$	$I_D Max.$
60V	2.5Ω@10V	115mA
	3Ω@5V	

Features

- High density cell design for low RDS(ON)
- Voltage controlled small signal switch
- Rugged and reliable
- High saturation current capability
- Load Switch for Portable Devices
- DC/DC Converter

Mechanical Data

- SOT-523 Small Outline Plastic Package.
- Epoxy UL: 94V-0.
- Mounting Position: Any.



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
2N7002T	SOT-523	K72	3000

Absolute Maximum Ratings (Ta=25°C unless otherwise noted)

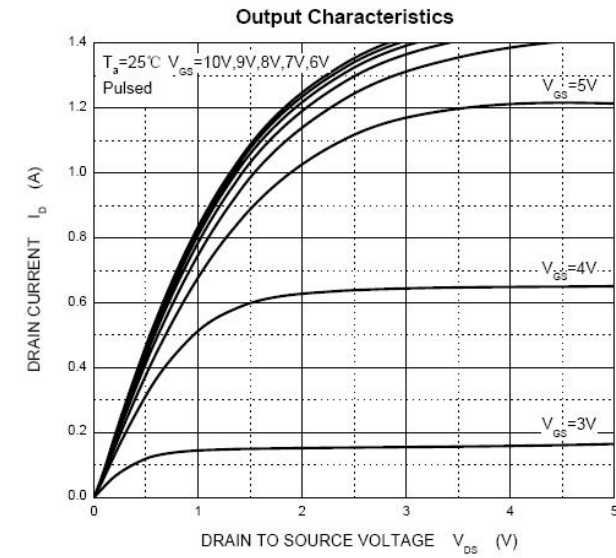
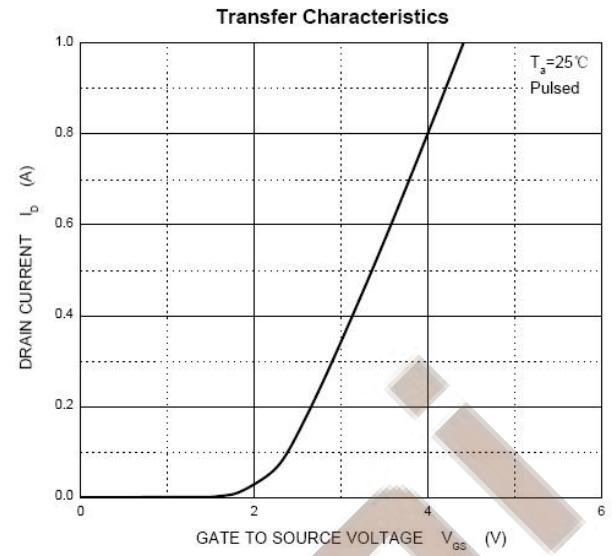
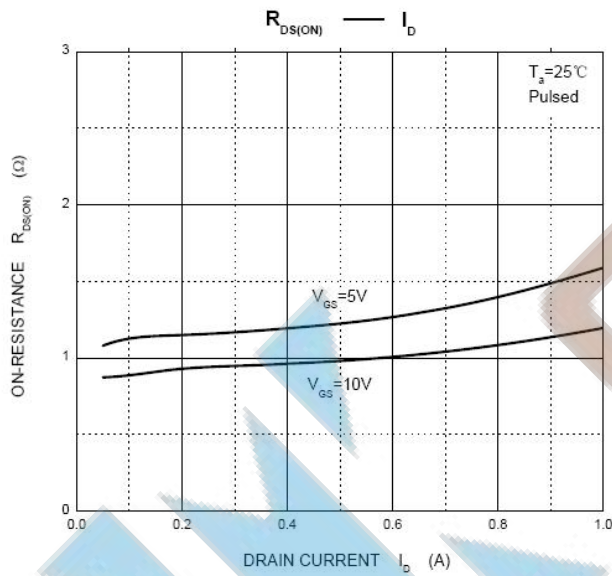
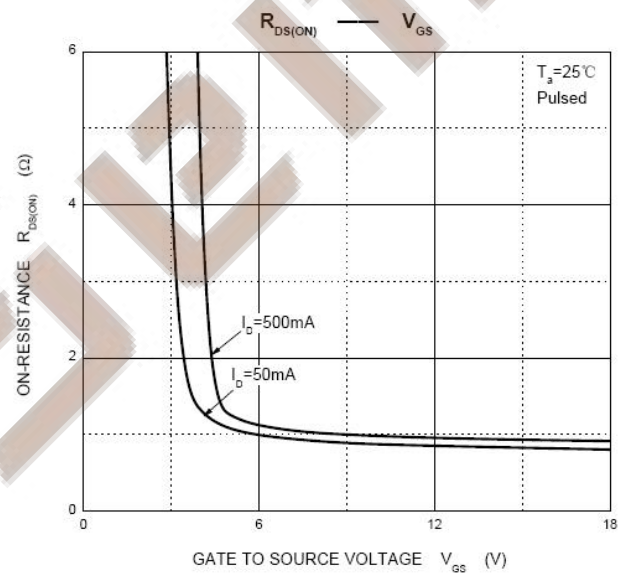
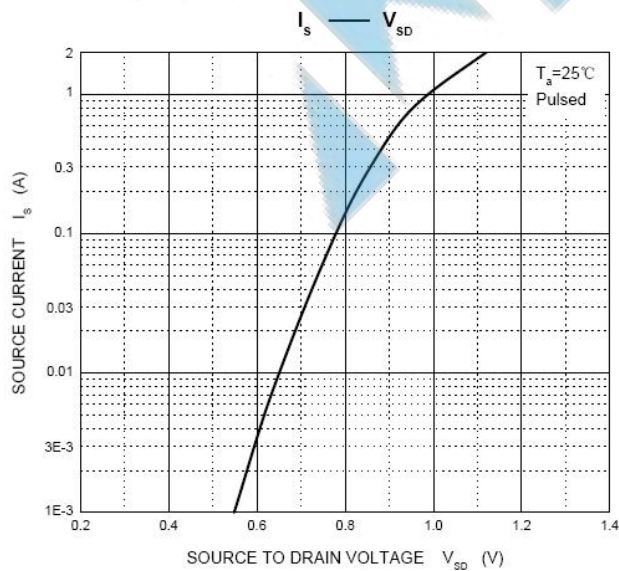
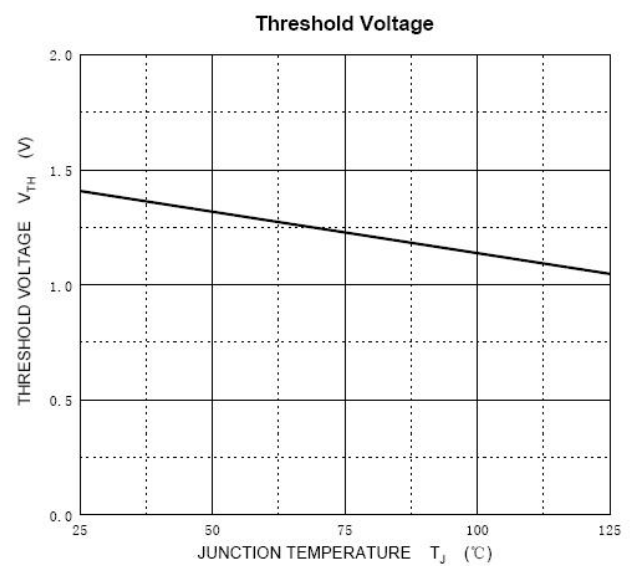
Parameter	Symbols	Rating	Units
Drain-Source Voltage	VDS	60	V
Gate-Source Voltage	VGS	±20	V
Continuous Drain Current	ID	0.115	A
Power Dissipation	PD	150	mW
Junction Temperature	Tj	150	°C
Storage Temperature	Tstg	-50-+150	°C
Thermal Resistance From Junction to Ambient	R θ JA	833	°C/W

Electrical Characteristics (Tj=25°C, unless otherwise noted)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	V(BR)DSS	VGS=0V, ID=250uA	60			V
Gate-Threshold voltage	V GS (th)	VDS= VGS, ID=250uA	1.0		2.5	V
Gate-body Leakage	IGSS	VDS=0V, VGS=±20V			±80	nA
Zero Gate Voltage Drain current	IDSS	VDS=60V, VGS=0V			80	nA
On-state Drain Current	ID(ON)	VGS=10V, VDS=7V	500			mA
Drain-Source On-Resistance (note2)	RDS(ON)	VGS=10V, ID=500mA		0.9	2.5	Ω
		VGS=5V, IC=50mA		1.1	3	
Forward Tran conductance	gFS	VDS=10V, ID=200mA	80			mS
Drain-source on-voltage	VDS(ON)	VGS=10V, ID=500mA			3.75	V
		VGS=5V, ID=50mA			0.375	V
Diode Forward Voltage	VSD	Is=115mA, VGS=0V	0.55		1.2	V
Dynamic Parameters *						
Input capacitance	Ciss	VDS=25V, VGS=0V,f=1MHz			50	pF
Output capacitance	Coss				25	
Reverse Transfer capacitance	Crss				5	
Switching Parameters *						
Turn-on Delay Time	td(on)	VGEN=10V,VDD=25V, RG=25 Ω			20	ns
Turn-off Delay Time	td(off)	RL=50 Ω , ID=500mA			40	ns

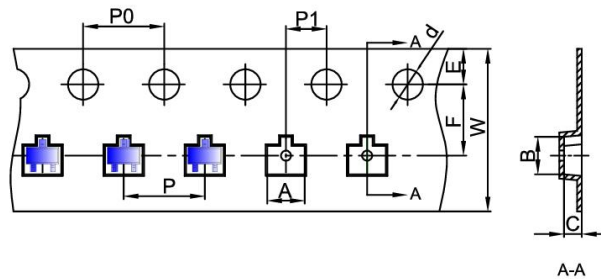
* These parameters have no way to verify.

Typical Characteristics



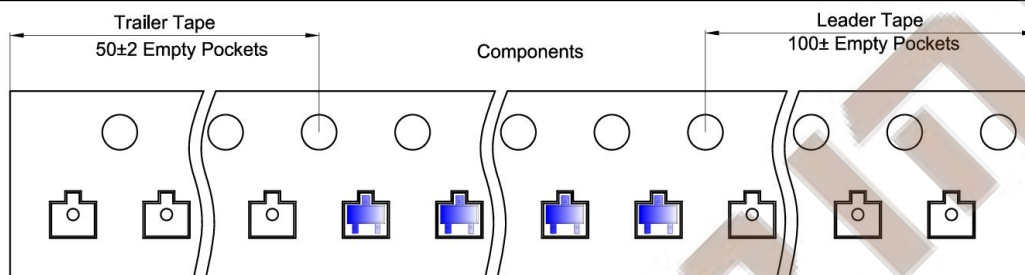
Package Information

Carrier Dimension(mm)

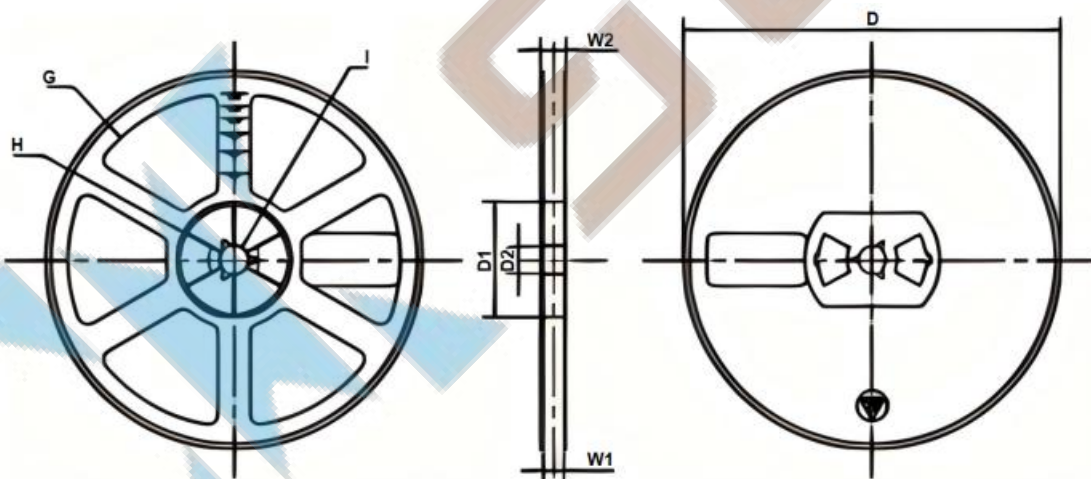


Dimensions are in millimeter

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



Reel Dimension(mm)



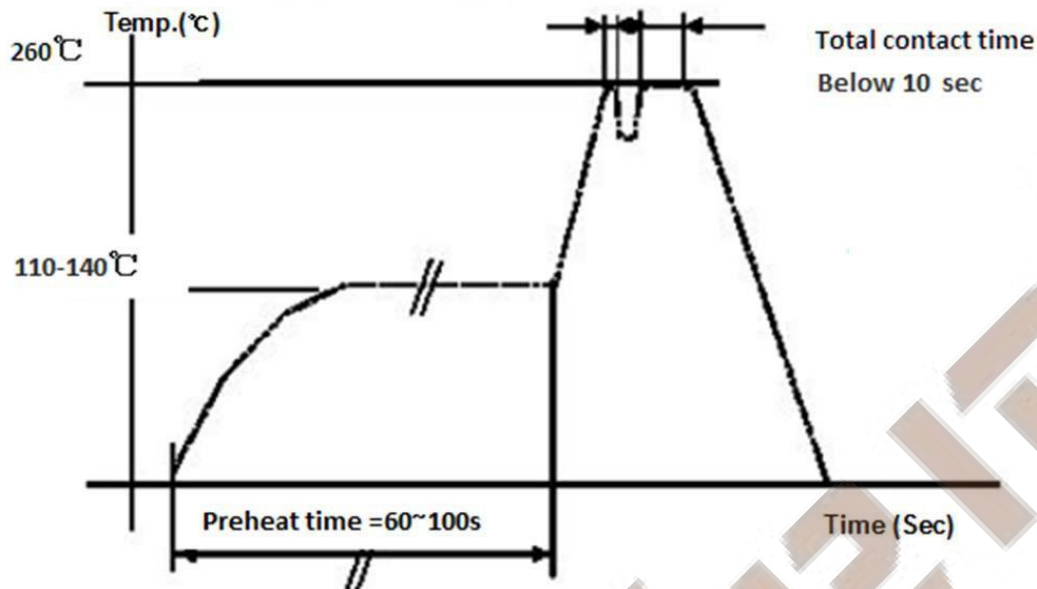
Reel Option	D	D1	D2	G	H	I	W1	W2
7"Dia	Φ178.00	54.40	13.00	R78.00	R25.60	R6.50	9.50	12.30
Tolerance	±2	±1	±1	±1	±1	±1	±1	±1

Package Specifications

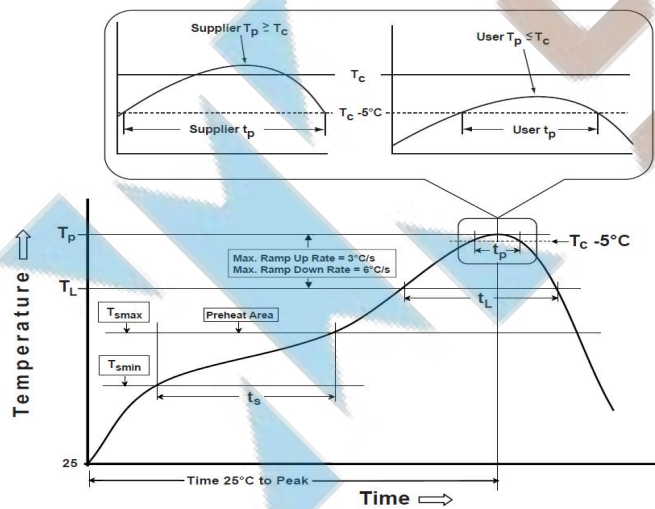
Package	Reel Size	Reel DIA. (mm)	Q'TY/Reel (Kpcs)	Box Size (mm)	QTY/Box (Kpcs)	Carton Size (mm)	Q'TY/Carton (Kpcs)
SOT523	7'	178	3	210*208*203	45	440*400*230	180

Recommended Soldering Profile for Rectifier Diodes (Pb Free)

a) Wave Soldering Profile



b) Reflow Soldering Profile (Pb Free Application), refer to IPC/JEDEC J-STD-020

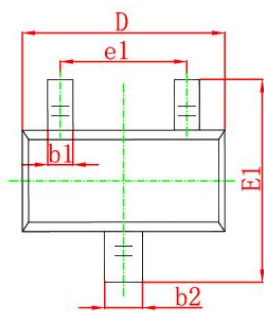
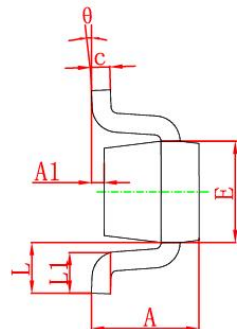
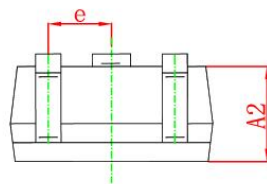


Preheat/Soak Temperature Min (Tsmin) Temperature Max (Tsmax) Time (ts) from (Tsmin to Tsmax)	50 °C 200 °C 60-120 seconds
Melting Point of Solder (Sn Ag Cu)	217°C
Ramp-up Rate to 217°C(Melting Point of Solder)	3°C/sec
Time at Temp.>217°C (Melting Point of Solder)	60~150 Sec
Peak Temperature	255±5°C
Time within 5°Cbelow Peak Temp.	20~40 Sec
Cooling Rate	6°C/sec (max)
Time from 25°C to Peak Temp.	8min (max)

c) Manual Soldering

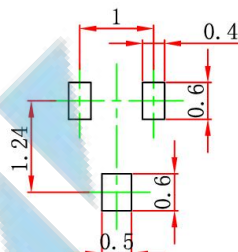
When using an electric soldering iron for manual soldering, it is recommended that the temperature does not exceed 300°C and the soldering time is less than 10 seconds.

Package Mechanical Data



Symbol	Dimensions In Millimeters		Dimensions In 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°

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.

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