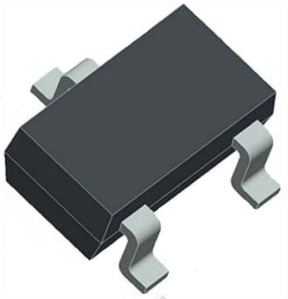
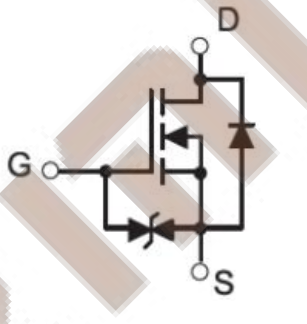
General Description

V_R	$R_{DSON\ MAX}$	I_D Max.
60V	3.0Ω@10V	340mA
	3.2Ω@4.5V	

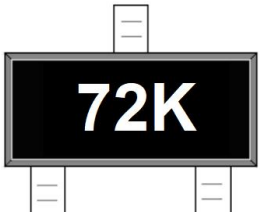




Features

- 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
- ESD protected

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)
2N7002KT	SOT-523	72K	3000

Absolute Maximum Ratings (Ta=25℃ unless otherwise noted)

Parameter	Symbols	Rating	Units
Drain-Source Voltage	VDS	60	V
Gate-Source Voltage	VGS	±20	V
Continuous Drain Current	ID	0.34	A
Pulsed Drain Current (note 1)	IDM	0.80	A
Power Dissipation	PD	150	mW
Junction Temperature	Tj	150	℃
Storage Temperature	Tstg	-50-+150	℃
Thermal Resistance From Junction to Ambient	R θ JA	625	℃/W

Electrical Characteristics (T_J=25℃,unless otherwise noted)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
STATIC PARAMETERS						
Drain-Source Breakdown Voltage	V(BR)DSS	VGS=0V, ID=250uA	60			V
Gate-Threshold voltage(note 2)	V GS (th)	VDS= VGS, ID=1mA	1.0	1.3	2.5	V
Gate-body Leakage	IGSS	VDS=0V, VGS=±20V			±10	uA
Zero Gate Voltage Drain current	IDSS	VDS=48V, VGS=0V			1	uA
On-state Drain Current	ID(ON)	VGS=10V, VDS=7V	500			mA
Drain-Source On-Resistance (note2)	RDS(ON)	VGS=10V, ID=500mA		2.2	3.0	Ω
		VGS=4.5V, IC=200mA		2.4	3.2	
DYNAMIC PARAMETERS (note 3)						
Input capacitance	Ciss	VDS=10V, VGS=0V,f=1MHz			40	pF
Output capacitance	Coss				30	
Reverse Transfer capacitance	Crss				10	
SWITCHING PARAMETERS (note 3)						
Turn-on Delay Time	td(on)	VGS=10V,VDD=50V, RG=50Ω			10	ns
Turn-off Delay Time	td(off)	RL=250Ω, RGS=50Ω			15	ns
Reverse Recovery Time	trr	VGS=0V,VR=25V, IS=300mA		30		ns
Recovered Charge	BVGSO	IS=±1mA	±21.5		±32	V
DRAIN-SOURCE DIODE						
Diode Forward Voltage(note 2)	VSD	Is=300mA, VGS=0V			1.5	V
Continuous Diode Forward Current	IS				0.2	A
Pulsed Diode Forward(note 1)	ISM				0.53	A

Notes:

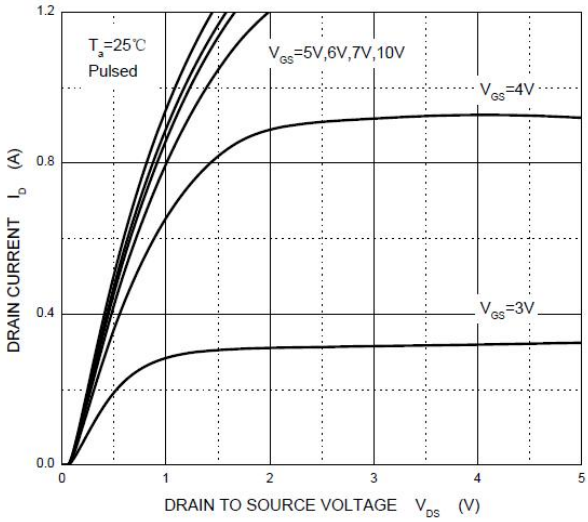
1.Repetitive rating : Pulse width limited by junction temperature

2.Pulse width ≤300us, duty cycle ≤2%.

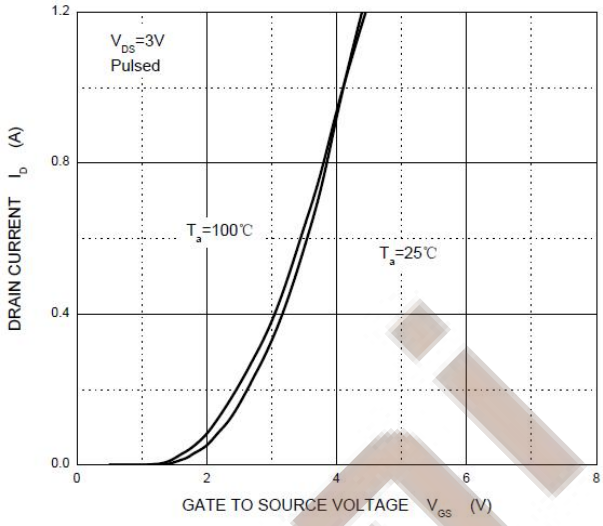
3.Guaranteed design, not subject to production testing.

Typical Characteristics

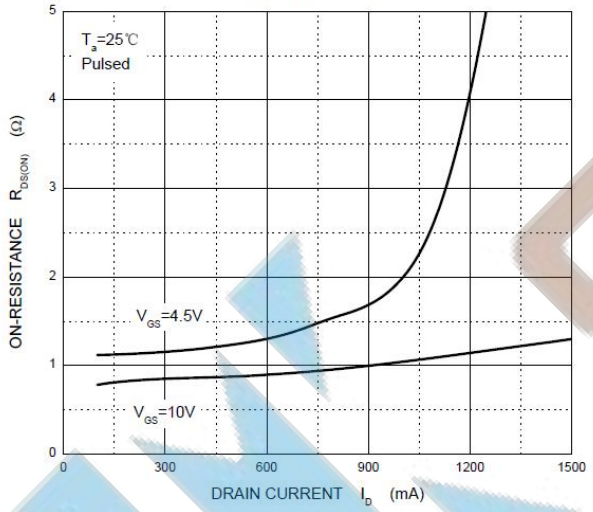
Output Characteristics



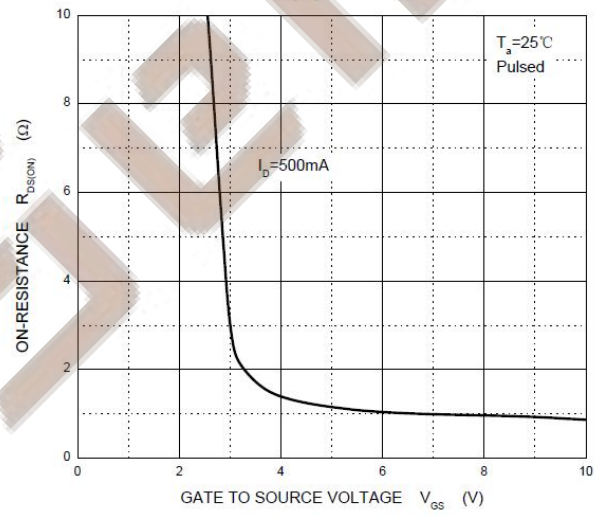
Transfer Characteristics



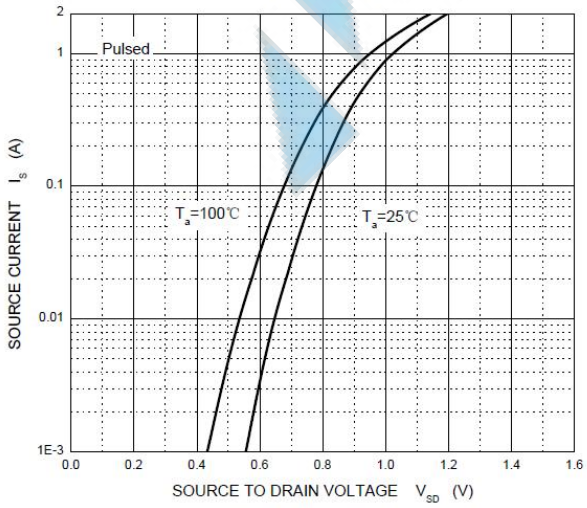
$R_{DS(ON)}$ — I_D



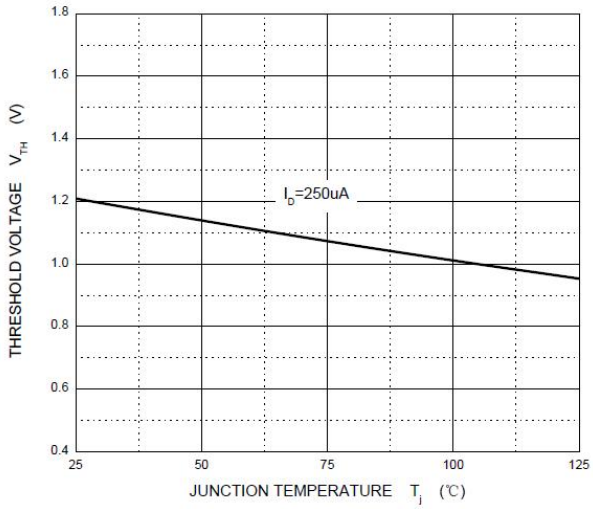
$R_{DS(ON)}$ — V_{GS}



I_S — V_{SD}

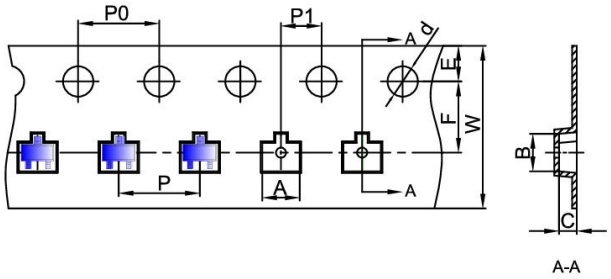


Threshold Voltage

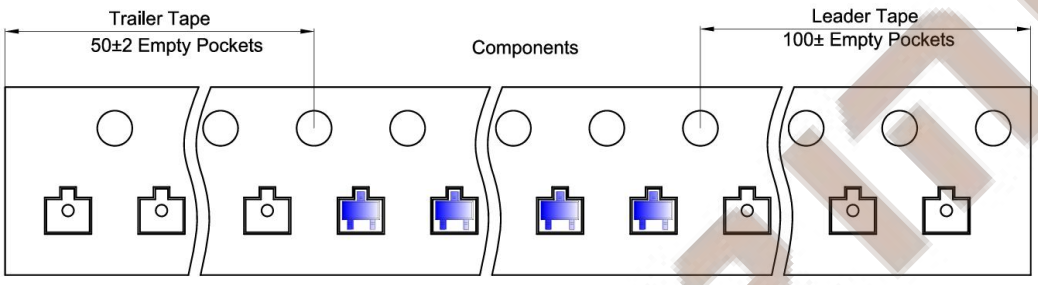


Package Information

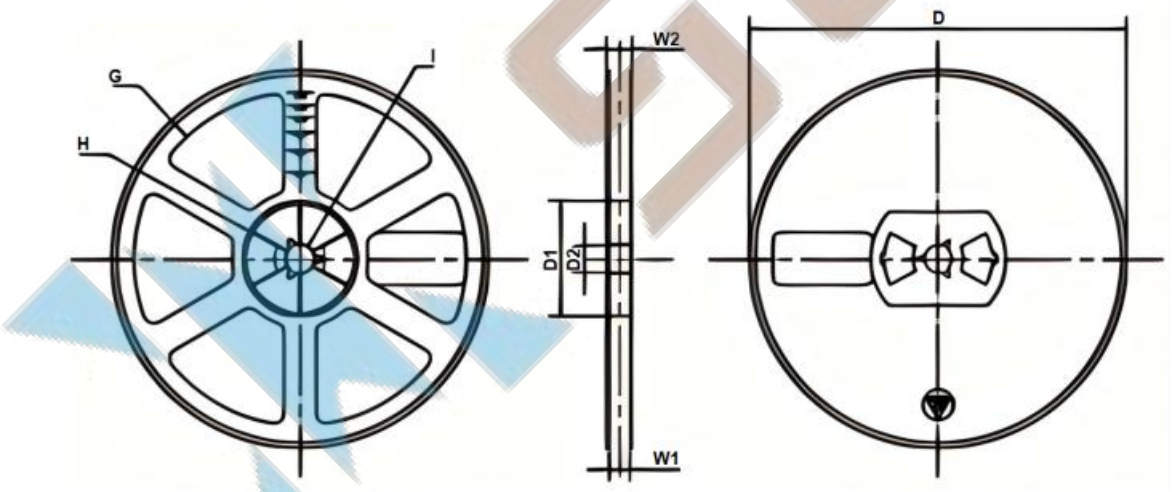
Carrier Dimension(mm)



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)



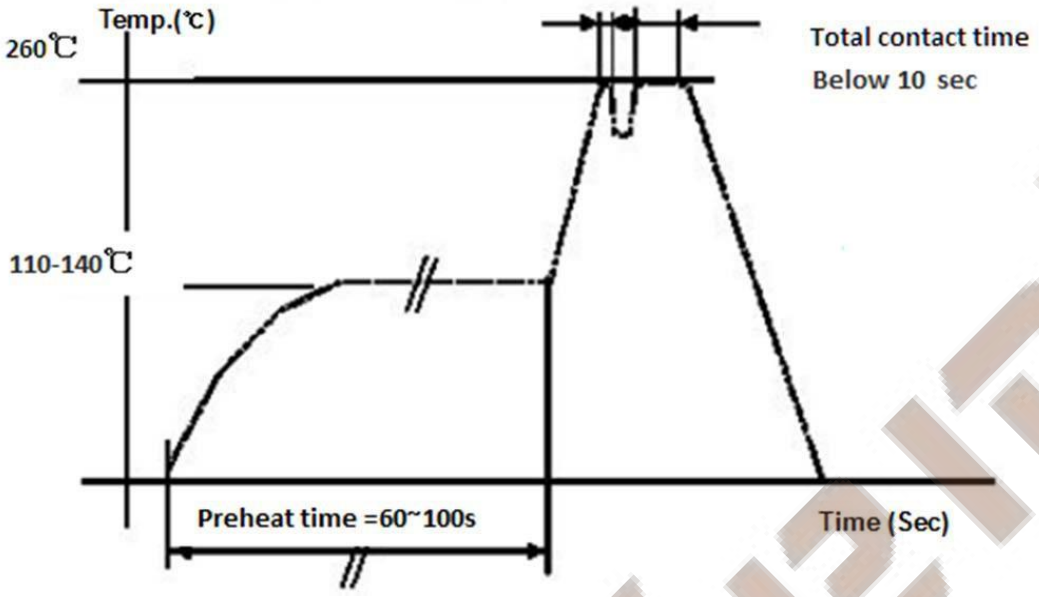
Reel Option	D	D1	D2	G	H	I	W1	W2
7"Dia	Φ178.00	54.40	13.00	R78.00	R25.60	R6.50	9.50	12.30
Tolerance	±2	±1	±1	±1	±1	±1	±1	±1

Package Specifications

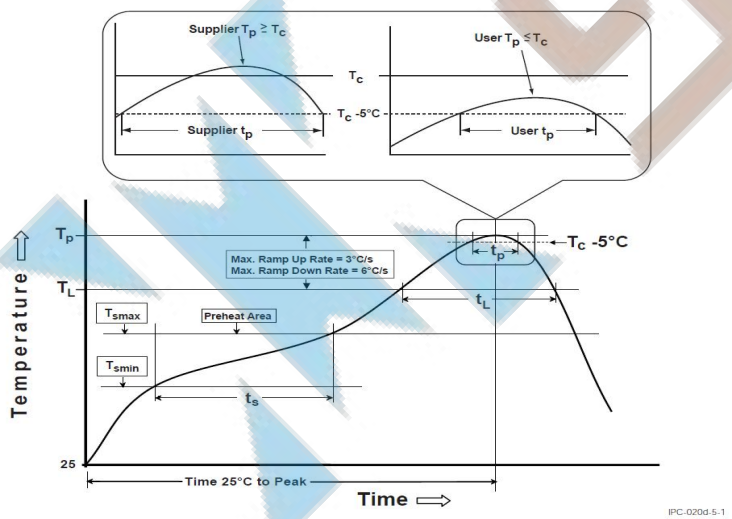
Package	Reel Size	Reel DIA. (mm)	Q'TY/Reel (Kpcs)	Box Size (mm)	QTY/Box (Kpcs)	Carton Size (mm)	Q'TY/Carton (Kpcs)
SOT523	7'	178	3	210*208*203	45	440*400*230	180

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

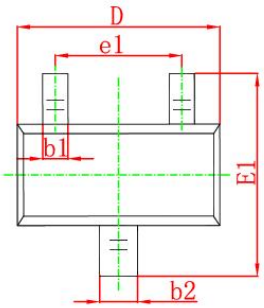


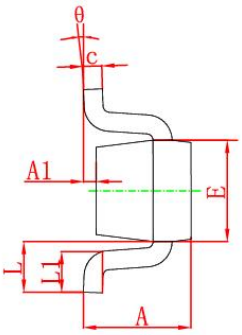
Preheat/Soak Temperature Min (Tsmin) Temperature Max (Tsmax) Time (ts) from (Tsmin to Tsmax)	50 °C 200 °C 60-120 seconds
Melting Point of Solder (Sn Ag Cu)	217℃
Ramp-up Rate to 217℃(Melting Point of Solder)	3℃/sec
Time at Temp.>217℃ (Melting Point of Solder)	60~150 Sec
Peak Temperature	255±5℃
Time within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

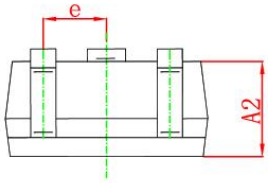
c) Manual Soldering

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

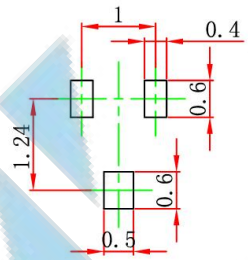






Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.700	0.900	0.028	0.035
A1	0.000	0.100	0.000	0.004
A2	0.700	0.800	0.028	0.031
b1	0.150	0.250	0.006	0.010
b2	0.250	0.350	0.010	0.014
c	0.100	0.200	0.004	0.008
D	1.500	1.700	0.059	0.067
E	0.700	0.900	0.028	0.035
E1	1.450	1.750	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:±0.05mm.
3.The pad layout is for reference purposes only.

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