

General Description



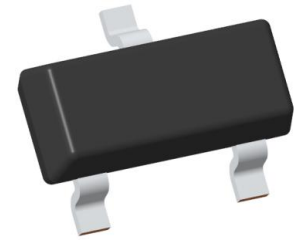
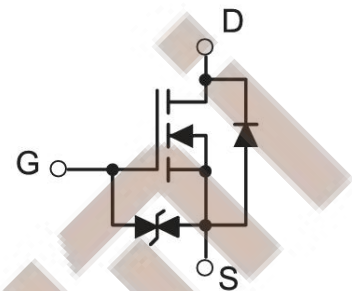
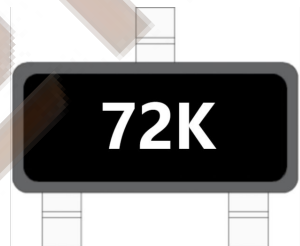
VR	RDSON MAX	ID Max.	Tjmax
60V	2.7 Ω @10V	340mA	150°C
	3.0 Ω @4.5V		

Features

- Energy Efficient
- Low Threshold Voltage
- High-speed Switching.
- DC/DC Converter.

Mechanical Data

- SOT-23 Small Outline Plastic Package.
- Epoxy UL: 94V-0.
- Mounting Position: Any.



Package Marking and Ordering Information

Product ID	Pack	Marking	Qty(PCS)
2N7002K	SOT-23	72K	3000

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

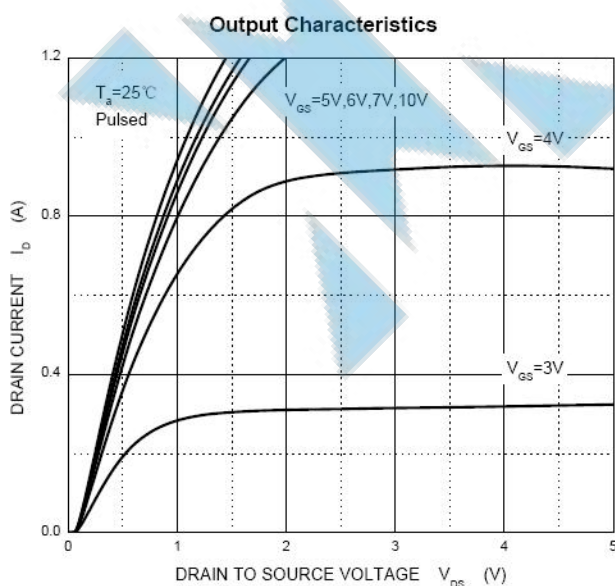
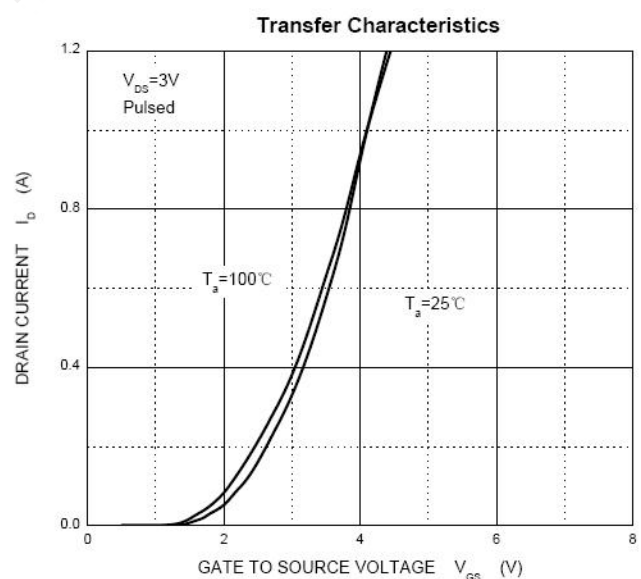
Parameter	Symbols	Rating	Units
Drain-Source Voltage	VDS	60	V
Gate-Source Voltage	VGS	± 20	V
Continuous Drain Current	ID	340	mA
Power Dissipation	PD	350	mW
Junction Temperature	Tj	150	°C
Storage Temperature	Tstg	-50-+150	°C
Thermal Resistance From Junction to Ambient	RθJA	357	°C/W

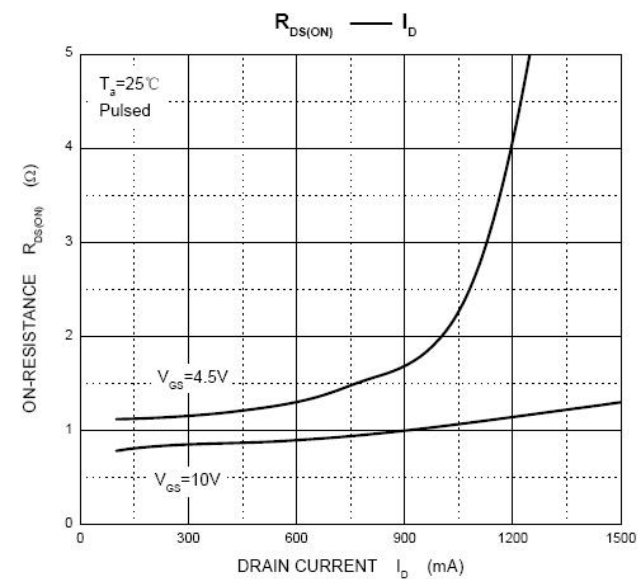
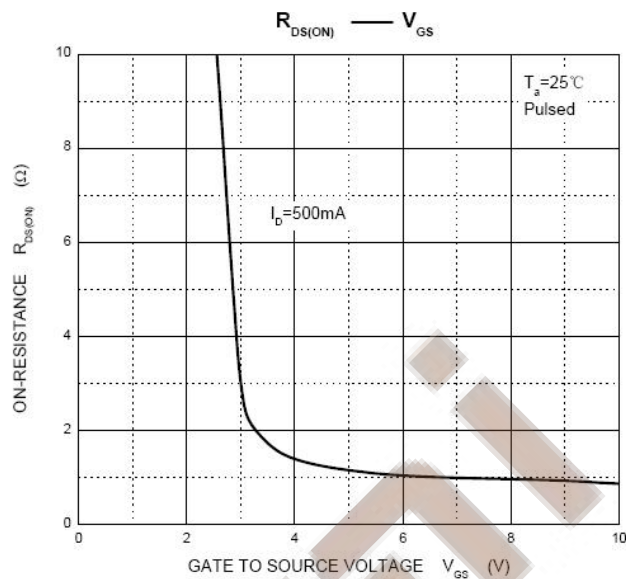
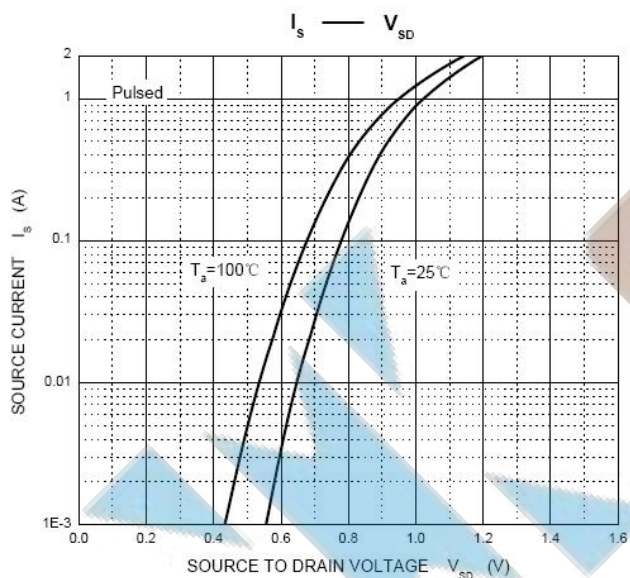
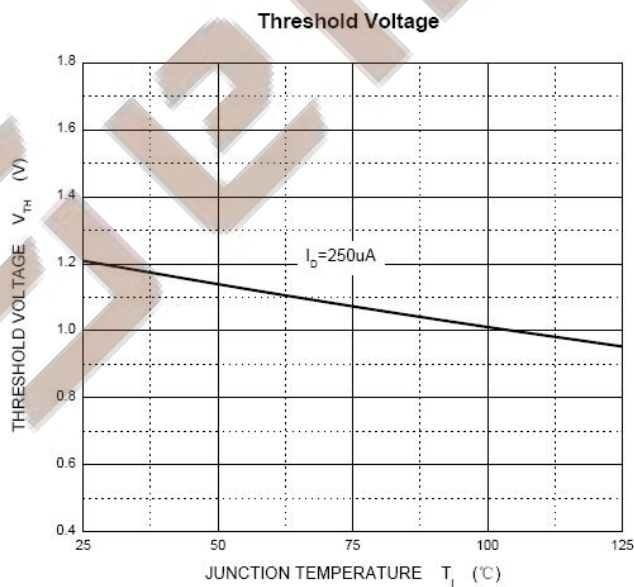
Electrical Characteristics (Ta=25°C, unless otherwise noted)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Drain-Source Breakdown Voltage	V(BR)DSS	VGS=0V, ID=250uA	60			V
Gate-Threshold voltage (Note1)	VGS (th)	VDS=VGS, ID=1mA	1.0	1.7	2.5	V
Gate-body Leakage	IGSS	VDS=0V, VGS= ± 20V		± 2.3	± 10	uA
		VDS=0V, VGS= ± 10V		± 62	± 200	nA
		VDS=0V, VGS= ± 5V		± 5	± 100	nA
Zero Gate Voltage Drain current	IDSS	VDS=48V, VGS=0V			1	uA
Drain-Source On-Resistance (Note1)	RDS(ON)	VGS=10V, ID=500mA		2.5	2.7	Ω
		VGS=4.5V, IC=200mA		2.2	3.0	
Diode Forward Voltage	VSD	Is=300mA, VGS=0V			1.5	V
Gate-Source Breakdown Voltage	BVGSO	Igs= ± 1mA(Open Drain)	± 21.5		± 32	V
Input capacitance	Ciss	VDS=10V, VGS=0V, f=1MHz			40	pF
Output capacitance	Coss				30	
Reverse Transfer capacitance	Crss				10	
Turn-on Delay Time	td(on)	VDD=50V, RL=250Ω, VGS=10V,			10	ns
Turn-off Delay Time	td(off)	RGS=50Ω, RG=50Ω			15	ns
Reverse recovery Time	trr	VGS=0V, IS=300mA, VR=25V, Dis/dt=-100A/uS		30		ns

Notes: 1. Pulse Test: Pulse Width ≤ 300us, Duty Cycle ≤ 2%.

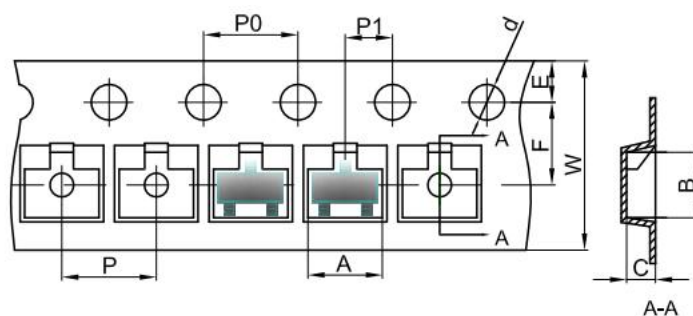
Typical Characteristics





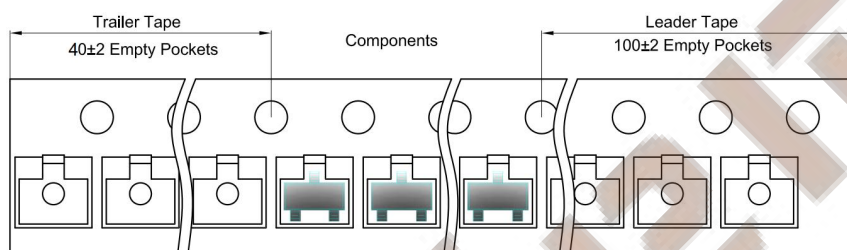
Package Information

Carrier Dimension(mm)

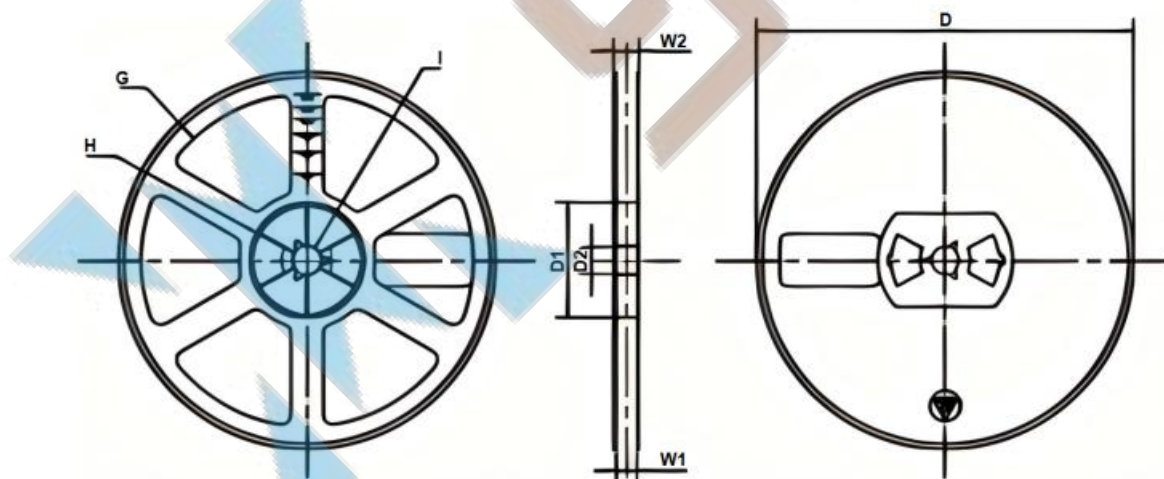


Dimensions are in millimeter

Pkg Type	A	B	C	d	E	F	P0	P	P1	10*P0	W
SOT-23	3.15	2.77	1.22	Ø1.50	1.75	3.50	4.00	4.00	2.00	40.00	8.00
(Tolerance)	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.1	±0.2	±0.1



Reel Dimension(mm)



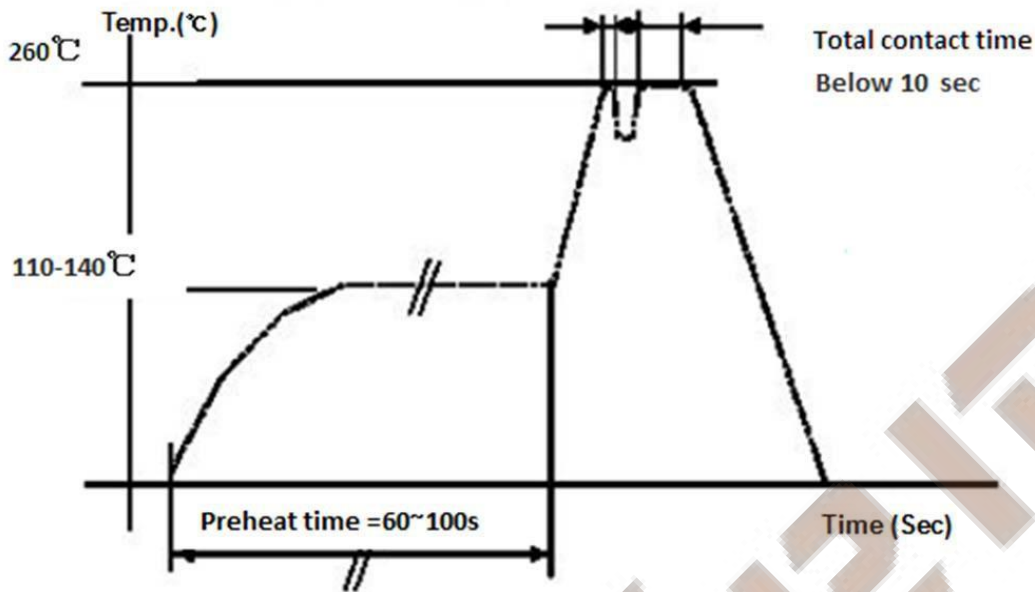
Reel Option	D	D1	D2	G	H	I	W1	W2
7"Dia	Φ178.00	54.40	13.00	R78.00	R25.60	R6.50	9.50	12.30
Tolerance	±2	±1	±1	±1	±1	±1	±1	±1

Package Specifications

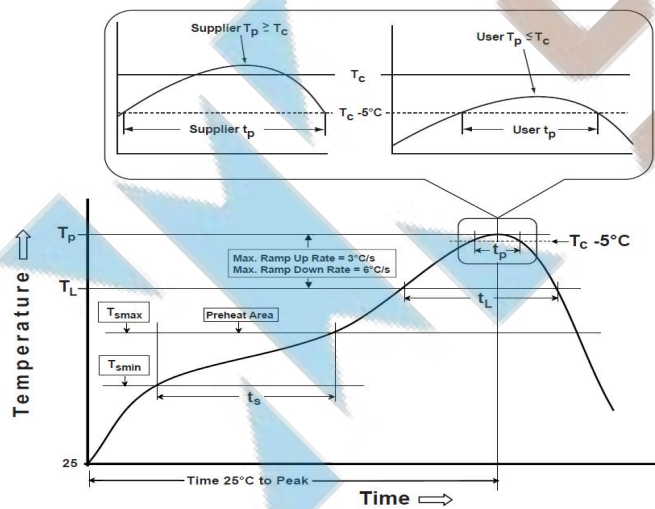
Package	Reel Size	Reel DIA. (mm)	Q'TY/Reel (Kpcs)	Box Size (mm)	QTY/Box (Kpcs)	Carton Size (mm)	Q'TY/Carton (Kpcs)
SOT23	7'	178	3	210*208*203	45	440*400*230	180

Recommended Soldering Profile for Rectifier Diodes (Pb Free)

a) Wave Soldering Profile



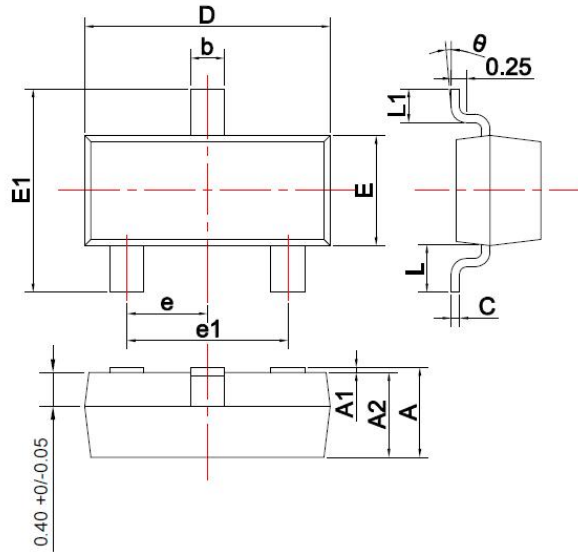
b) Reflow Soldering Profile (Pb Free Application), refer to IPC/JEDEC J-STD-020



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)

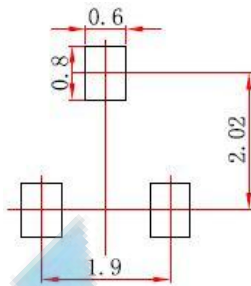
c) Manual Soldering

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	
	MIN.	MAX.
A	0.900	1.150
A1	0.000	0.100
A2	0.900	1.050
b	0.300	0.500
c	0.080	0.150
D	2.800	3.000
E	1.200	1.400
E1	2.250	2.550
e	0.950TYP	
e1	1.800	2.000
L	0.550REF	
L1	0.300	0.500
θ	0°	8°

Unit: mm

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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