



CHONGQING CLOUDCHILD TECHNOLOGY CO.,LTD

SOT-523 Plastic-Encapsulate MOSFETS

2N7002T

N-Channel Power MOSFET

V_{DS}	$R_{DS(ON)}$ (Typ.)	I_D
60 V	0.85Ω@10V 0.95Ω@4.5V	0.34A

DESCRIPTION

The 2N7002T provides excellent $R_{DS(ON)}$ with low gate charge.

It can be used in a wide variety of applications.

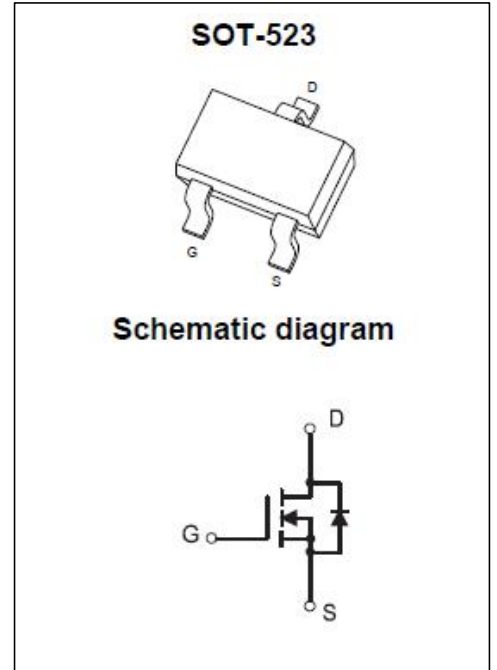
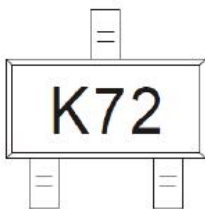
FEATURES

- Trench Technology Power MOSFET
- Low $R_{DS(ON)}$
- Low Gate Charge
- AEC-Q101 Qualified

APPLICATIONS

- Load Switch
- DC/DC Converter

MARKING



ABSOLUTE MAXIMUM RATINGS(T_J=25°C unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain - Source Voltage	V _{DS}	60	V
Gate - Source Voltage	V _{GS}	±20	V
Continuous Drain Current ^{1,5}	I _D	0.34	A
Pulsed Drain Current ²	I _{DM}	1.36	A
Power Dissipation ^{4,5}	P _D	0.3	W
Thermal Resistance from Junction to Ambient ⁵	R _{θJA}	500	°C/W
Junction Temperature	T _J	175	°C
Storage Temperature	T _{STG}	-55~ +175	°C

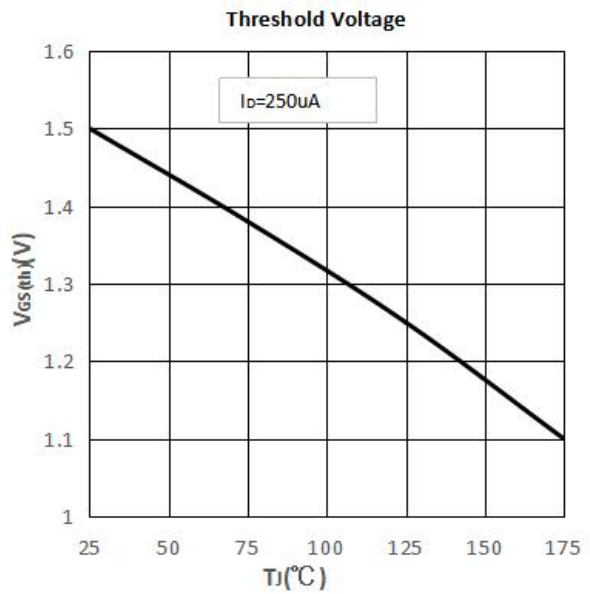
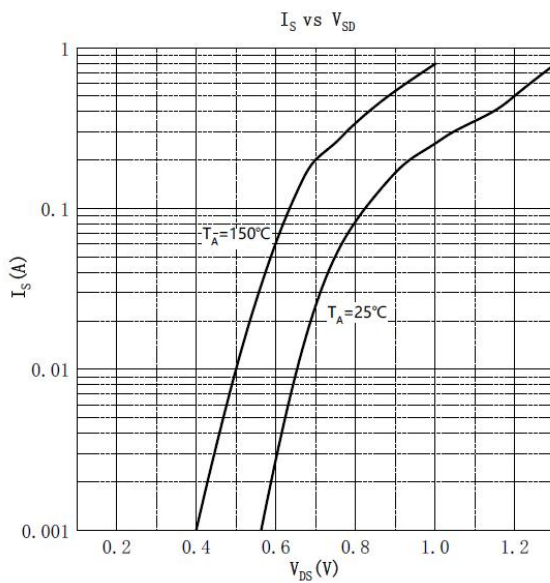
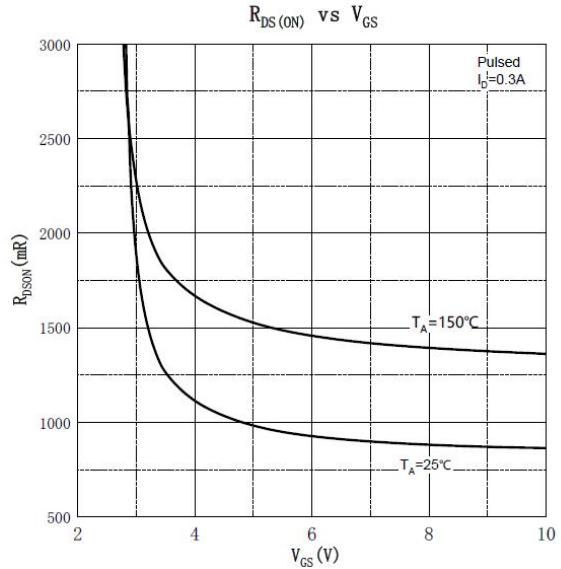
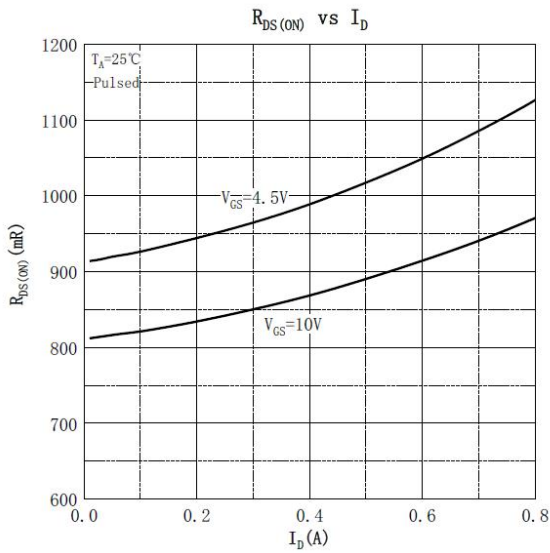
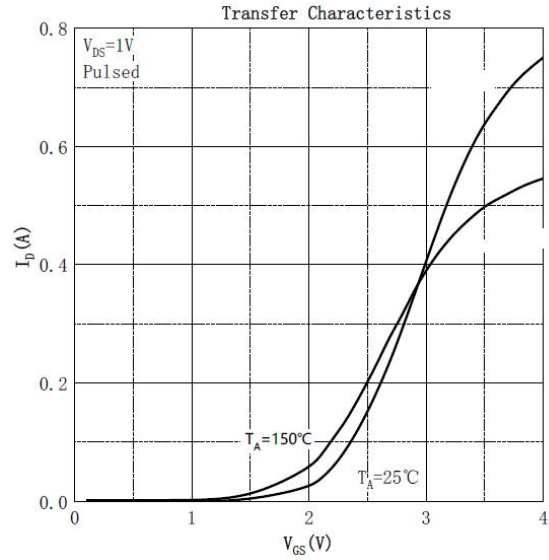
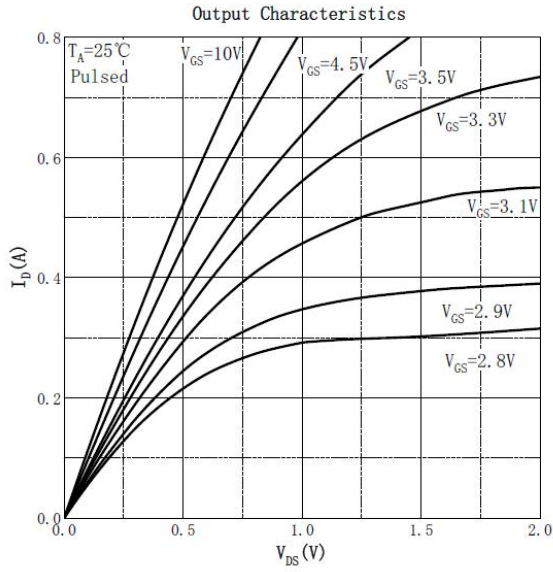
MOSFET ELECTRICAL CHARACTERISTICS(TC=25°C unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Off Characteristics						
Drain - Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D = 250μA	60			V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 48V, V _{GS} = 0V			1	μA
Gate - Body Leakage Current	I _{GSS}	V _{GS} = ±20V, V _{DS} = 0V			±95	nA
On Characteristics³						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250μA	1	1.5	2.5	V
Drain-source On-resistance	R _{DS(on)}	V _{GS} = 10V, I _D = 0.3A		0.85	2.5	Ω
		V _{GS} = 4.5V, I _D = 0.2A		0.95	3	
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} = 30V, V _{GS} = 0V, f = 1MHz		34.8		pF
Output Capacitance	C _{oss}			6.4		
Reverse Transfer Capacitance	C _{rss}			3.5		
Gate Resistance	R _g	V _{DS} = 0V, V _{GS} = 0V, f = 1MHz		40		Ω
Switching Characteristics						
Total Gate Charge	Q _g	V _{DS} = 30V, V _{GS} = 10V, I _D = 0.3A		0.32		nC
Gate-source Charge	Q _{gs}			0.25		
Gate-drain Charge	Q _{gd}			0.17		
Turn-on Delay Time	t _{d(on)}	V _{DD} = 30V, V _{GS} = 10V, R _L = 100Ω, R _G = 3Ω		3.8		ns
Turn-on Rise Time	t _r			2.9		
Turn-off Delay Time	t _{d(off)}			14		
Turn-off Fall Time	t _f			8		
Source - Drain Diode Characteristics						
Diode Forward Voltage ³	V _{SD}	V _{GS} = 0V, I _S = 0.3A			1.2	V

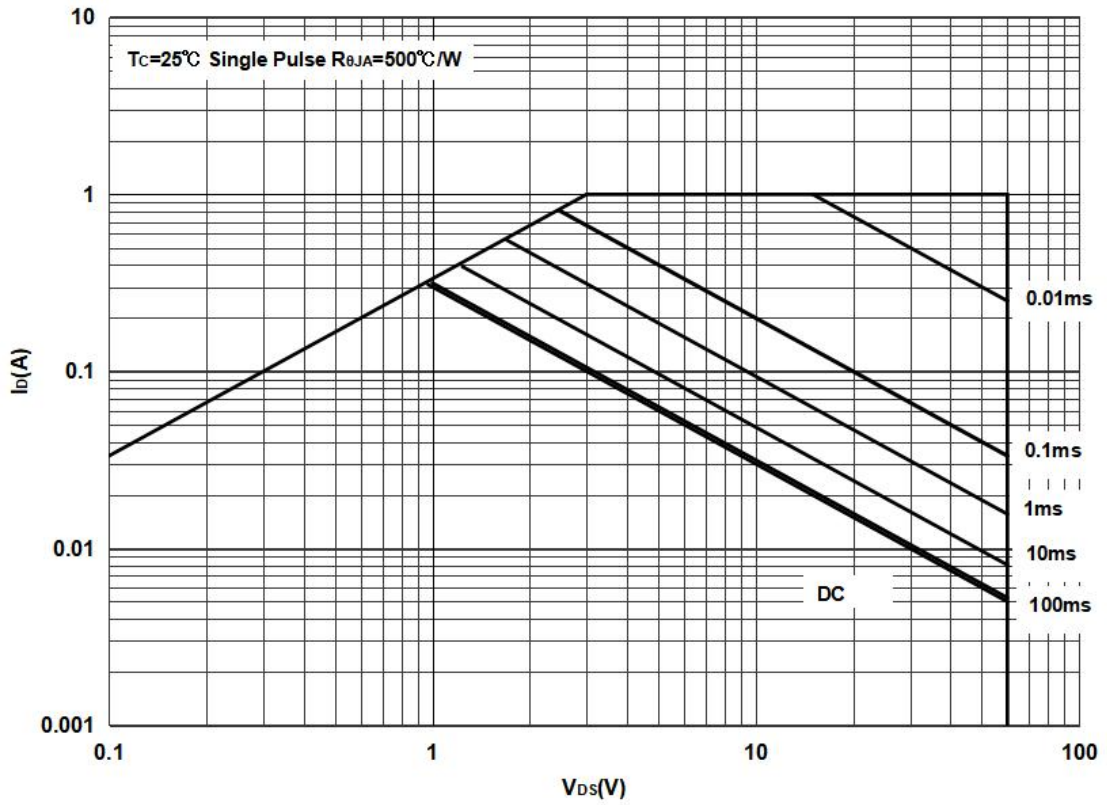
Notes :

- The maximum current rating is limited by package.
- Pulse Test : Pulse Width ≤ 10μs, duty cycle ≤ 1%.
- Pulse Test : Pulse Width ≤ 300μs, duty cycle ≤ 2%.
- The power dissipation P_D is limited by T_J(MAX) = 175°C.
- Device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with T_A = 25°C.

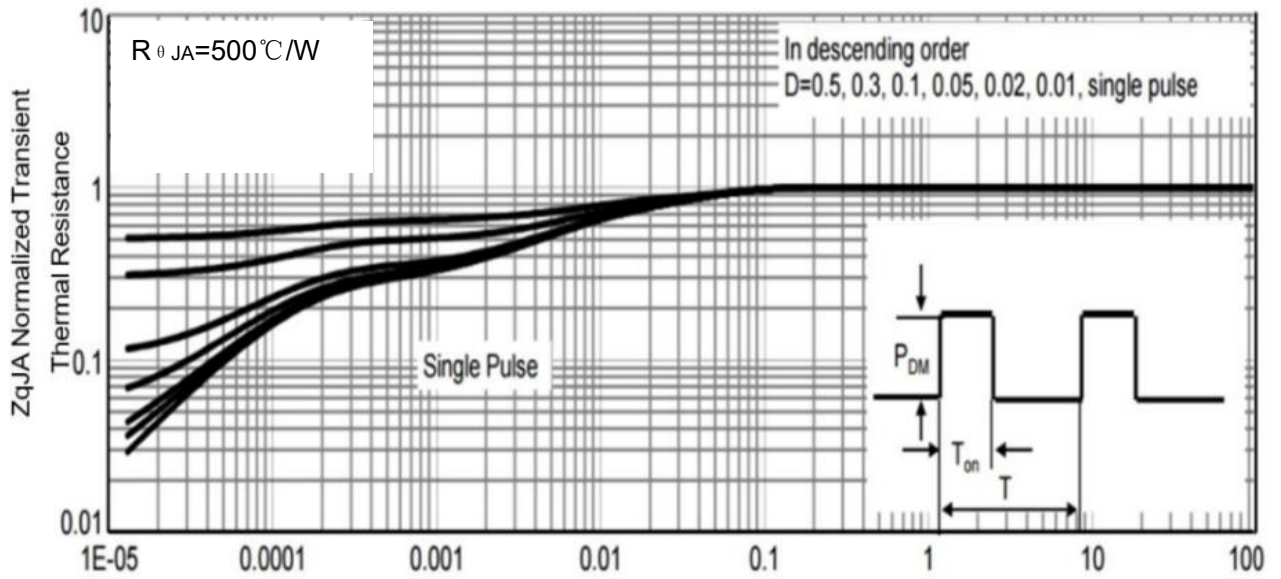
Characteristics Curve:



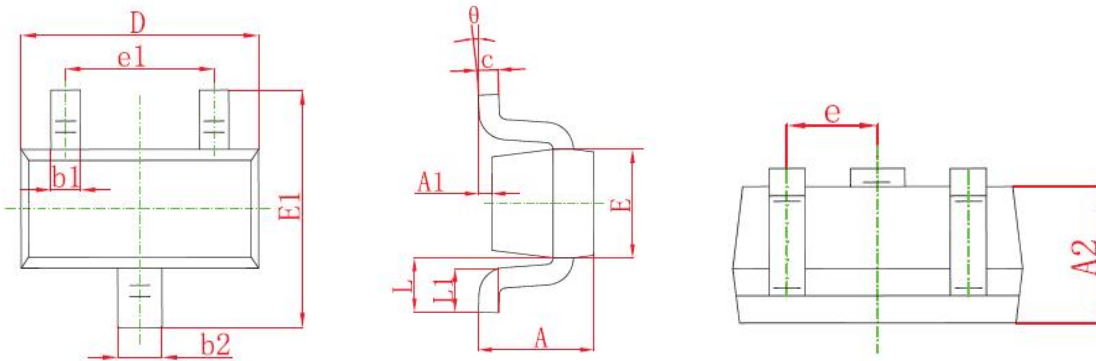
Maximum Forward Biased Safe Operating Area



Normalized Thermal Transient Impedance

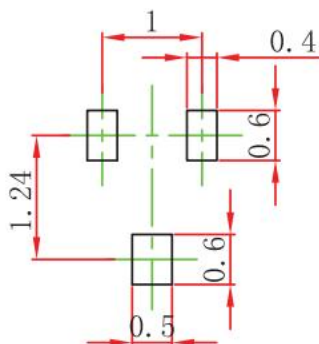


SOT-523 Package Outline Dimensions



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°

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.

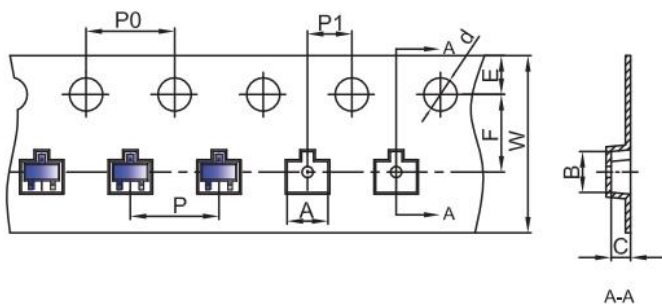
NOTICE

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SOT-523 Tape and Reel

SOT-523 Embossed Carrier Tape

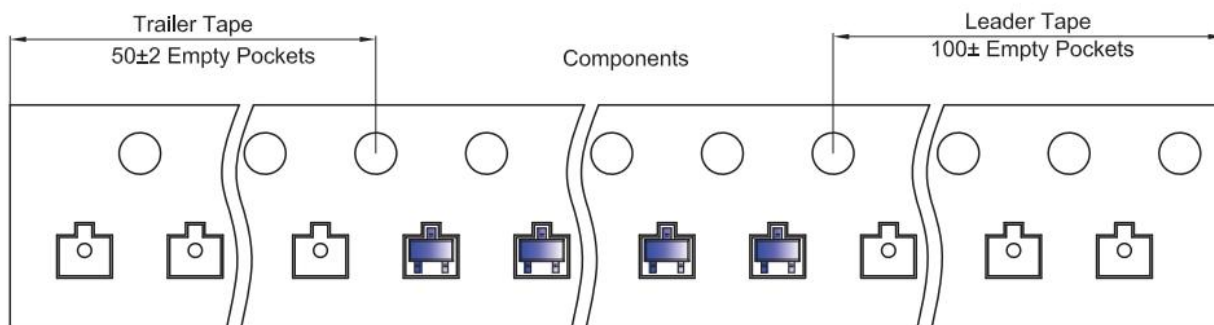


Packaging Description:

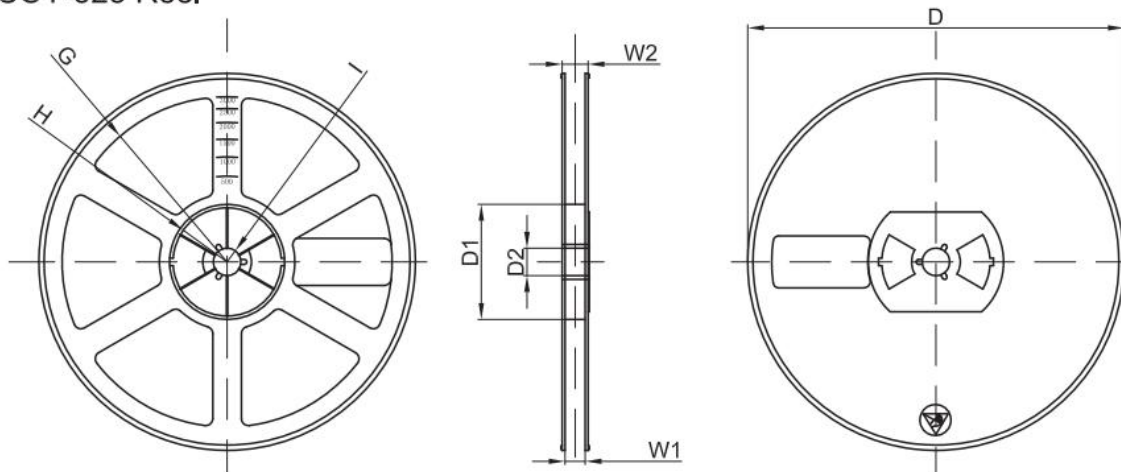
SOT-523 parts are shipped in tape. The carrier tape is made from a dissipative (carbon filled) polycarbonate resin. The cover tape is a multilayer film (Heat Activated Adhesive In nature) primarily composed of polyester film, adhesive layer, sealant, and anti-static sprayed agent. These reeled parts 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 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	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	

Date of change	Rev #	revise content
2023/2/23	A/0	/