



CHONGQING CLOUDCHILD TECHNOLOGY CO.,LTD

SOT-323 Plastic-Encapsulate MOSFETS

2N7002W

N-Channel Power MOSFET

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

DESCRIPTION

The 2N7002W provides excellent $R_{DS(ON)}$ with low gate charge.

It can be used in a wide variety of applications.

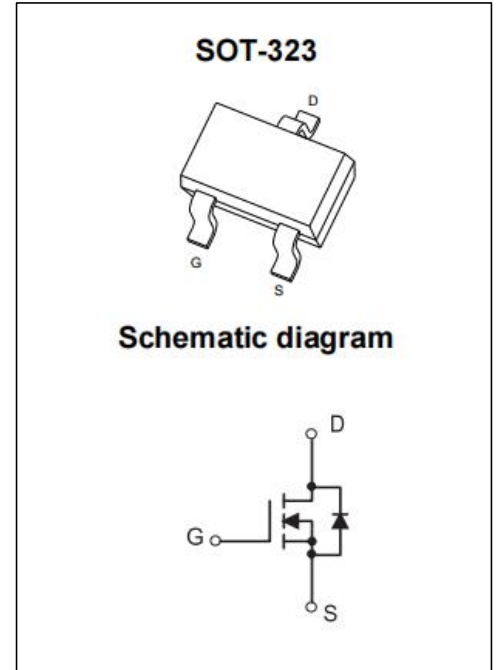
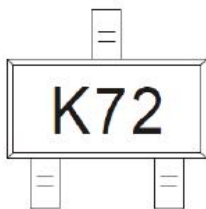
FEATURES

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

APPLICATIONS

- Load Switch
- DC/DC Converter

MARKING



ABSOLUTE MAXIMUM RATINGS($T_J=25^{\circ}\text{C}$ 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}	1.0	A
Power Dissipation ^{4,5}	P_D	0.36	W
Thermal Resistance from Junction to Ambient ⁵	$R_{\theta JA}$	416	$^{\circ}\text{C}/\text{W}$
Junction Temperature	T_J	175	$^{\circ}\text{C}$
Storage Temperature	T_{STG}	-55~ +175	$^{\circ}\text{C}$

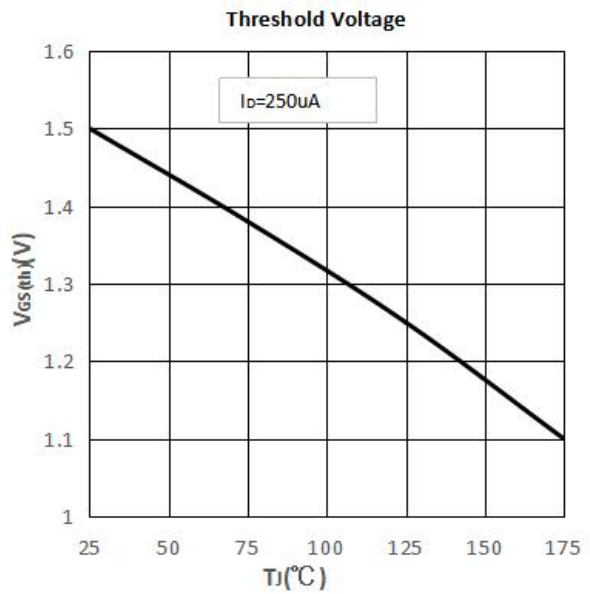
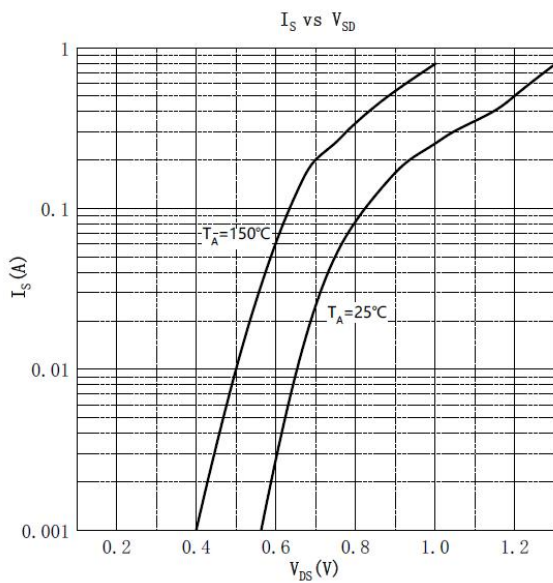
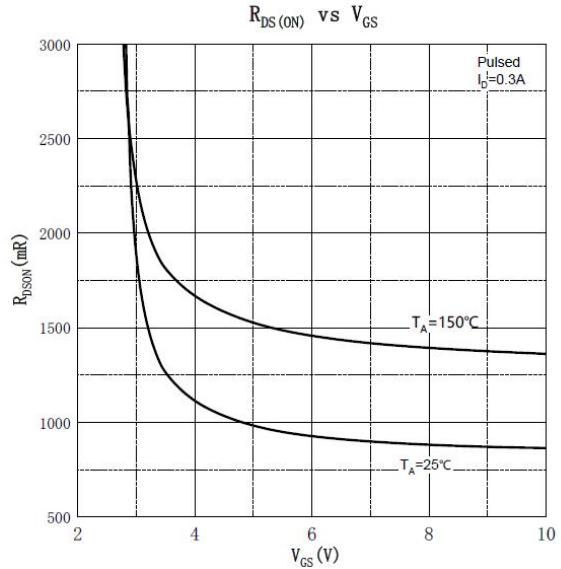
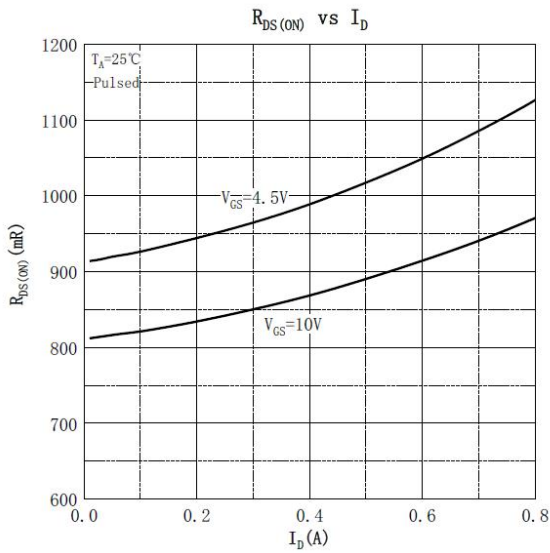
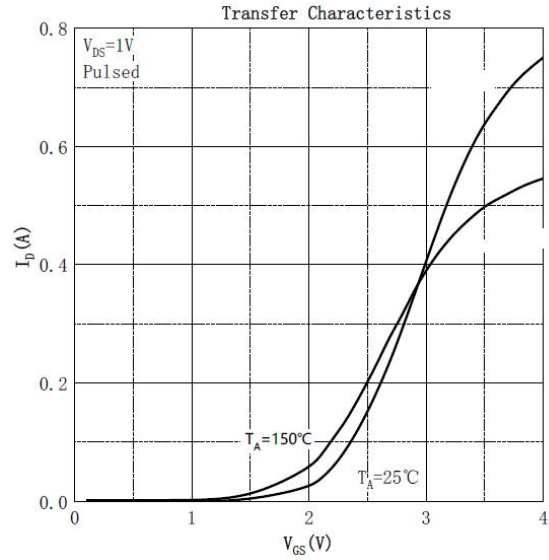
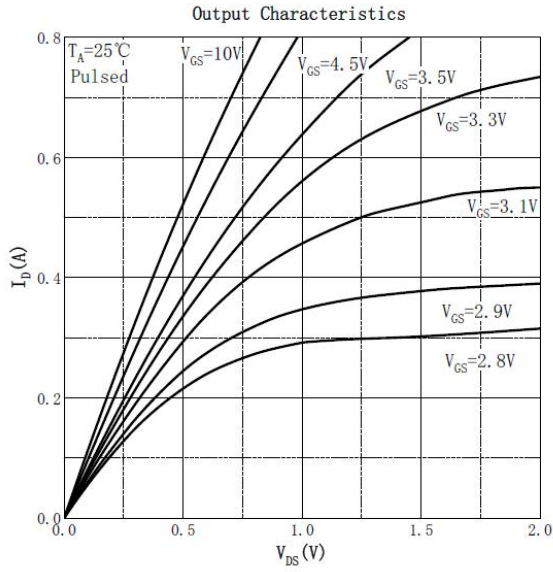
MOSFET ELECTRICAL CHARACTERISTICS($T_C=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Off Characteristics						
Drain - Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu\text{A}$	60			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 48V, V_{GS} = 0V$			1	μA
Gate - Body Leakage Current	I_{GSS}	$V_{GS} = \pm 20V, V_{DS} = 0V$			± 100	nA
On Characteristics³						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu\text{A}$	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}	$V_{DS} = 30V, V_{GS} = 0V, f = 1\text{MHz}$		34.8		pF
Output Capacitance	C_{oss}			6.4		
Reverse Transfer Capacitance	C_{rss}			3.5		
Gate Resistance	R_g	$V_{DS} = 0V, V_{GS} = 0V, f = 1\text{MHz}$		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	$t_{d(on)}$	$V_{DD} = 30V, V_{GS} = 10V,$ $R_L = 100\Omega, R_G = 3\Omega$		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

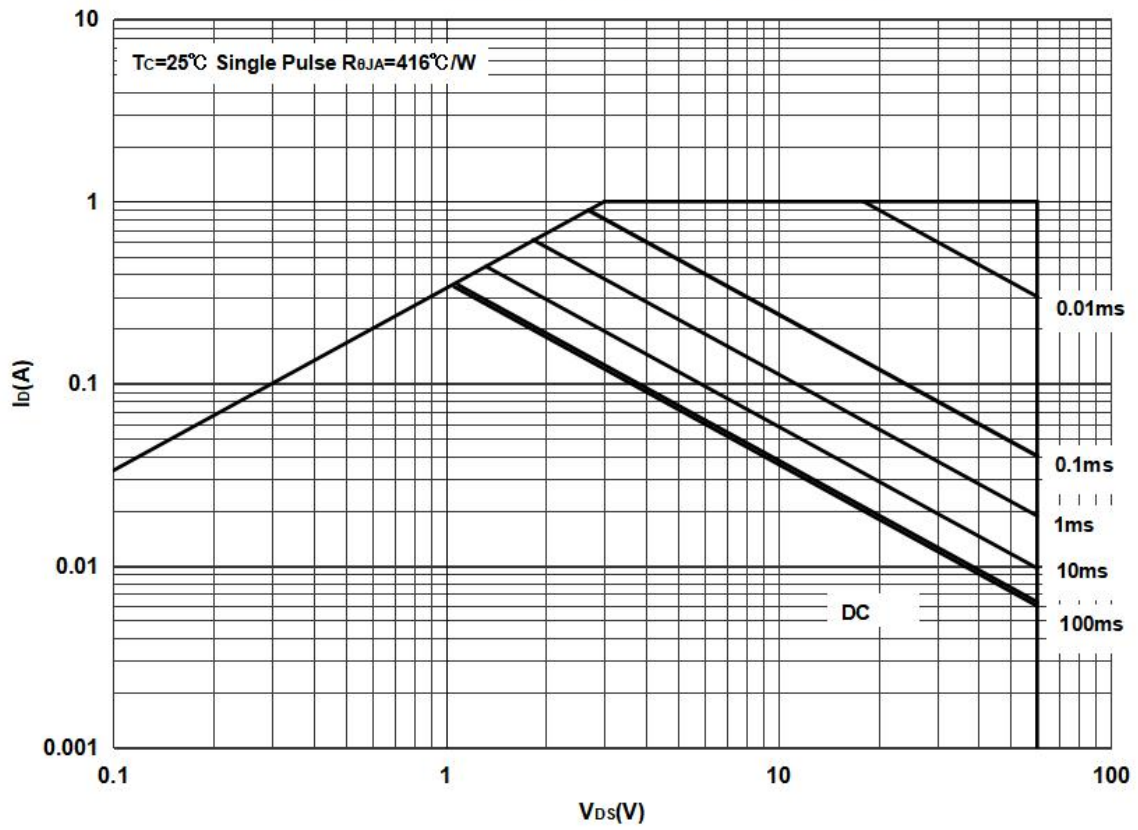
Notes :

- The maximum current rating is limited by package.
- Pulse Test : Pulse Width $\leq 10\mu\text{s}$, duty cycle $\leq 1\%$.
- Pulse Test : Pulse Width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$.
- The power dissipation P_D is limited by $T_J(\text{MAX}) = 175^{\circ}\text{C}$.
- Device mounted on 1in^2 FR-4 board with 2oz. Copper, in a still air environment with $T_A = 25^{\circ}\text{C}$.

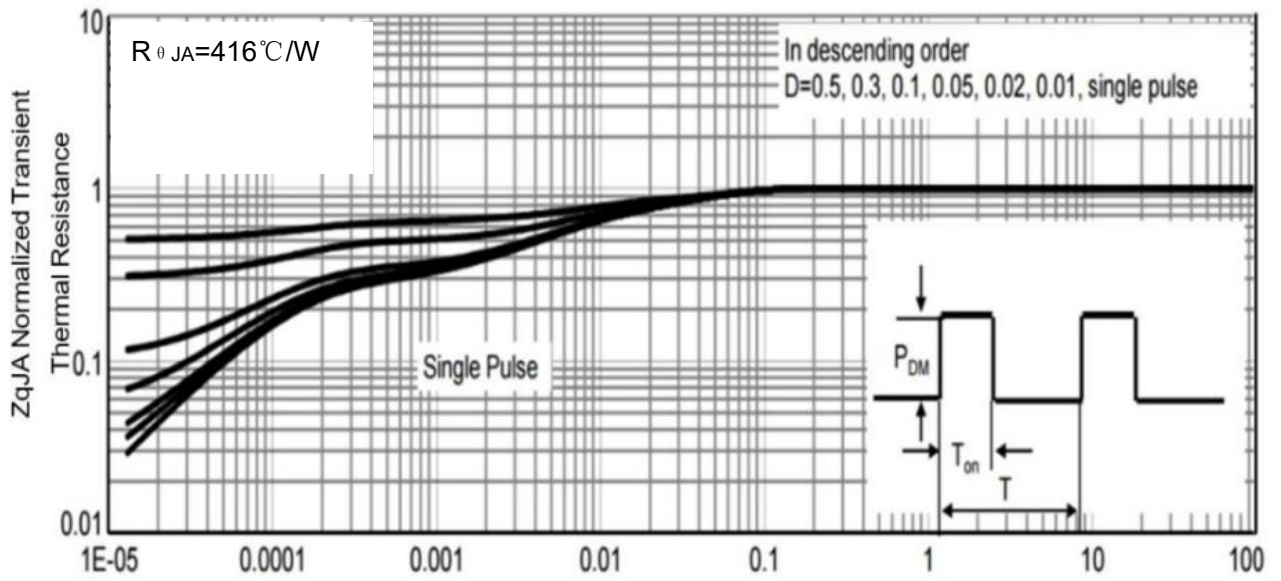
Characteristics Curve:



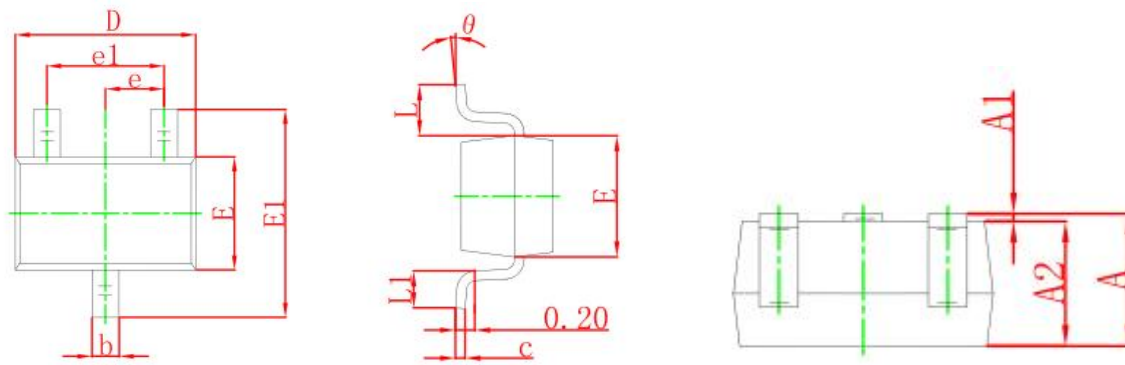
Maximum Forward Biased Safe Operating Area



Normalized Thermal Transient Impedance

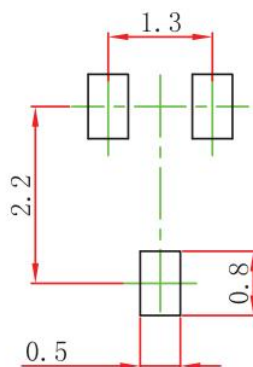


SOT-323 Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.900	1.100	0.035	0.043
A1	0.000	0.100	0.000	0.004
A2	0.900	1.000	0.035	0.039
b	0.200	0.400	0.008	0.016
c	0.080	0.150	0.003	0.006
D	2.000	2.200	0.079	0.087
E	1.150	1.350	0.045	0.053
E1	2.150	2.450	0.085	0.096
e	0.650 TYP		0.026 TYP	
e1	1.200	1.400	0.047	0.055
L	0.525 REF		0.021 REF	
L1	0.260	0.460	0.010	0.018
θ	0°	8°	0°	8°

SOT-323 Suggested Pad Layout



Note:

1. Controlling dimension: in millimeters.
2. General tolerance: ± 0.05 mm.
3. The pad layout is for reference purposes only.

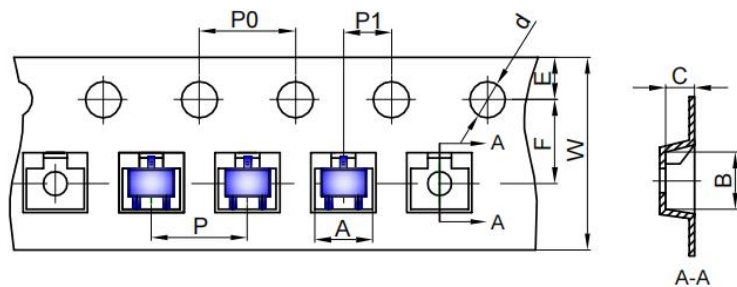
NOTICE

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SOT-323 Tape and Reel

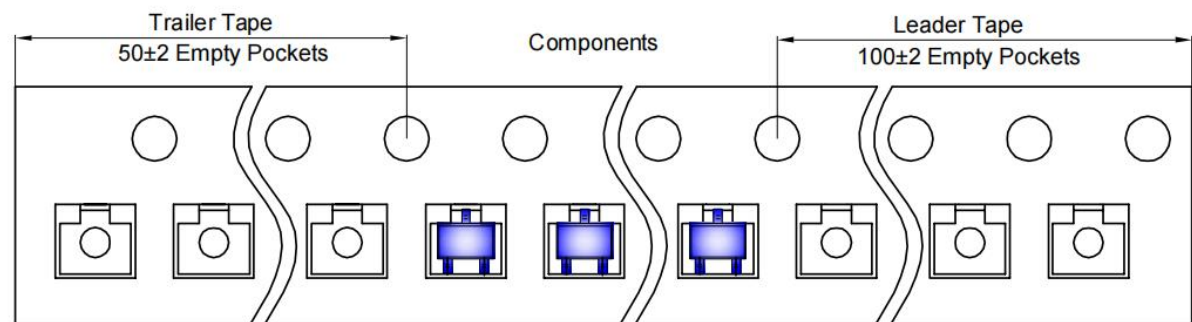
SOT-323 Embossed Carrier Tape



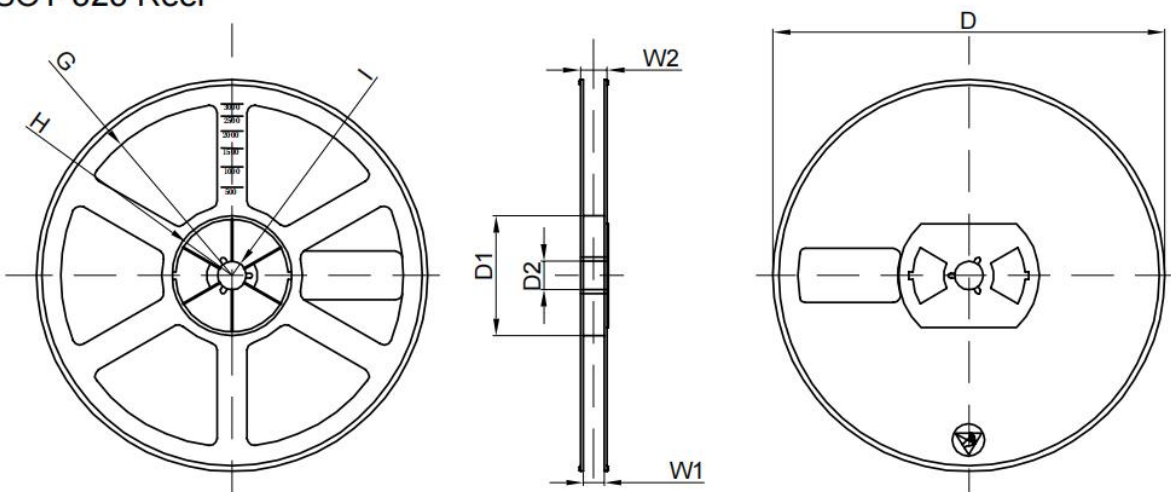
Packaging Description:
 SOT-323 parts are shipped in tape. The carrier tape is made from a dissipative (carbon filled) polycarbonate resin. The cover tape is a multilayer film (Heat Activated Adhesive in nature) primarily composed of polyester film, adhesive layer, sealant, and anti-static sprayed agent. 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-323	2.25	2.55	1.19	Ø1.55	1.75	3.50	4.00	4.00	2.00	8.00

SOT-323 Tape Leader and Trailer



SOT-323 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	30,000 pcs	203×203×195	120,000 pcs	438×438×220	

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