CHONGQING CLOUDCHILD TECHNOLOGY CO., LTD

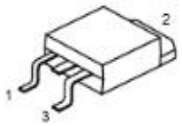
TO-252-2L Plastic-Encapsulate MOSFETS

CCMC03N120 N-Channel Power MOSFET

V_{DSS}	$R_{DS(ON)}$(Typ.)	I_D
1200 V	6.7Ω@10V	3A

TO-252

1. GATE
2. DRAIN
3. SOURCE



DESCRIPTION

The CCMC03N120 provides excellent $R_{DS(ON)}$ with low gate charge. It can be used in a wide variety of applications.

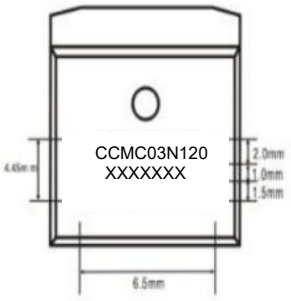
FEATURES

- RoHS Compliant
- Low ON Resistance
- Low Gate Charge
- Peak Current vs Pulse Width Curve
- Inductive Switching Curves
- AEC Q101 Qualified

APPLICATIONS

- SMPS
- Adaptor
- Electric welder

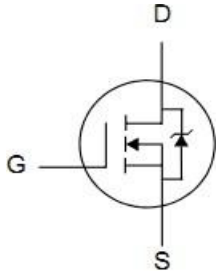
MARKING



CCMC03N120 =Part No.

XXXXXXX = Code

EQUIVALENT CIRCUIT



ABSOLUTE MAXIMUM RATINGS(T_c=25℃ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	1200	V
Gate-Source Voltage	V_{GS}	±30	V
Continuous Drain Current Tc=25℃	I_D	3	A
Continuous Drain Current Tc=125℃	I_D	1.8	A
Pulsed Drain Current [1]	I_{DM}	12	A
Single Pulse Avalanche Energy [2]	E_{AS}	31	mJ
Total Power Dissipation	P_D	100	W
Thermal Resistance from Junction to Case [3]	$R_{\theta JC}$	1.5	℃/W
Thermal Resistance from Junction to Ambient [4]	$R_{\theta JA}$	120	℃/W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55~ +175	℃
Soldering Temperature , for 10S(1.6mm from case)	-	260	℃

Notes:

1.Repetitive Rating: Pulse width limited by maximum junction temperature.

2.Start TJ = 25°C, L = 10mH , IAS = 2.5A, VGS =10V.

3.Water cooled heatsink, P_D adjusted for a peak junction temperature of 175℃.

4.1 cubic foot chamber, free air.

MOSFET ELECTRICAL CHARACTERISTICS

TC=25℃ unless otherwise specified

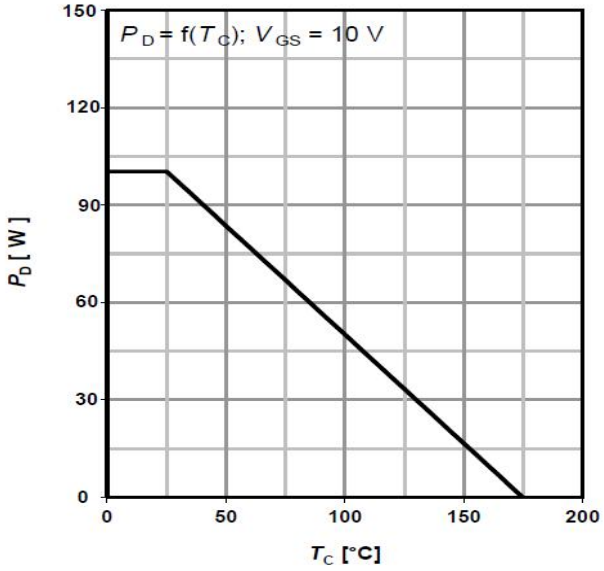
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Off characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D =250μA	1200			V
Zero gate voltage drain current	I_{DSS}	V_{DS} =1200V,V_{GS} = 0V,Tj=25℃		1.18	5	μA
		V_{DS} =1200V,V_{GS} = 0V,Tj=125℃		1.7	10	
		V_{DS} =1200V,V_{GS} = 0V,Tj=175℃		35	50	
Gate-body leakage current	I_{GSS}	V_{GS} =±30V, V_{DS} = 0V			±100	nA
On characteristics [1]						
Gate threshold voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =250μA	3	3.7	5	V
Drain-source on-resistance	$R_{DS(on)}$	V_{GS} =10V, I_D =1.5A		6.7	9	Ω
Transconductance	gfs	V_{DS}=15V, I_D=1.5A		3.8		S
Dynamic characteristics						
Input Capacitance	C_{iss}	V_{DS} =25V,V_{GS} =0V,f =1MHz		857		pF
Output Capacitance	C_{oss}			59		
Reverse Transfer Capacitance	C_{rss}			7.1		
Gate resistance	R_g	V_{GS} = 0V,V_{DS}=0V,f=1MHz		4.2		Ω
Switching characteristics						
Total Gate Charge	Q_g	V_{DD}=960V , V_{GS}=10V , I_D=3A		19.7		nC
Gate-Source Charge	Q_{gs}			7.5		
Gate-Drain Charge	Q_{gd}			5.4		
Turn-on delay time	$t_{d(on)}$	V_{DD}=600V , V_{GS}=10V , I_D=3A， R_G=10Ω		15.1		ns
Turn-on rise time	t_r			19.4		
Turn-off delay time	$t_{d(off)}$			25.6		
Turn-off fall time	t_f			76.2		
Drain-source Diode characteristics [1]						
Diode Forward Voltage	V_{SD}	V_{GS}=0V , I_{SD}=3A , T_J=25℃			1.5	V
Continuous Source Current	I_S	Tc = 25 °C			3	A
Pulsed drain-source diode forward current	I_{SM}	—			12	A
Reverse recovery time	Trr	I_F= 3A，di/dt=100A/us		526		ns
Reverse recovery charge	Qrr			2000		nC

Note :

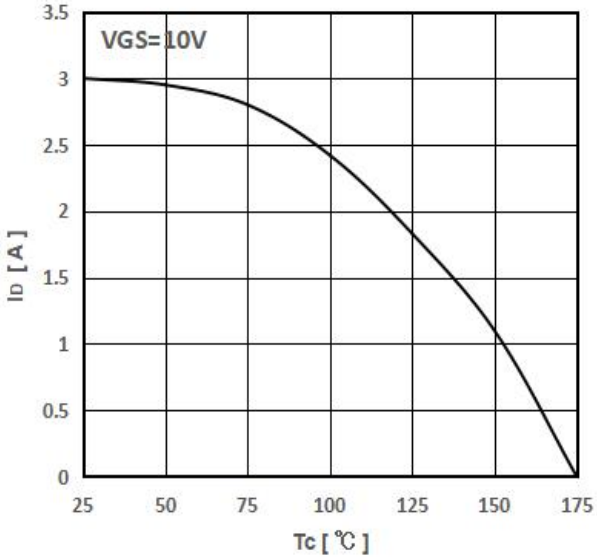
1. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.

Typical Characteristics

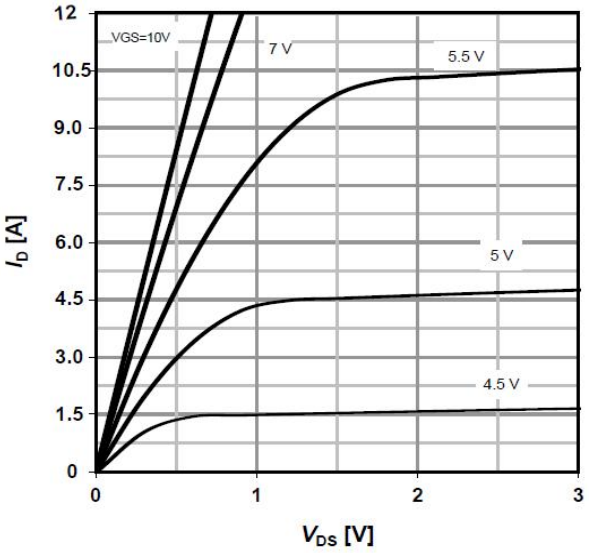
PD -- Tc



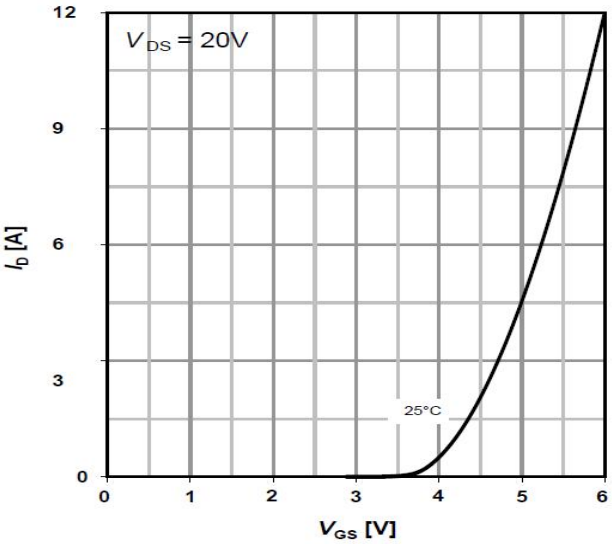
ID -- Tc



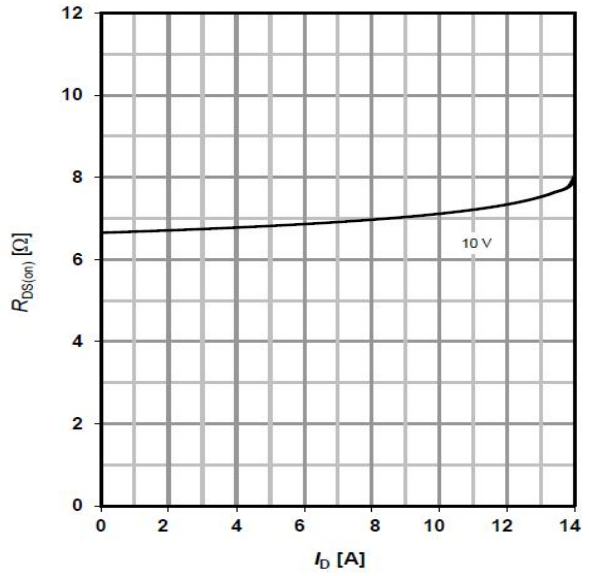
ID -- VDS



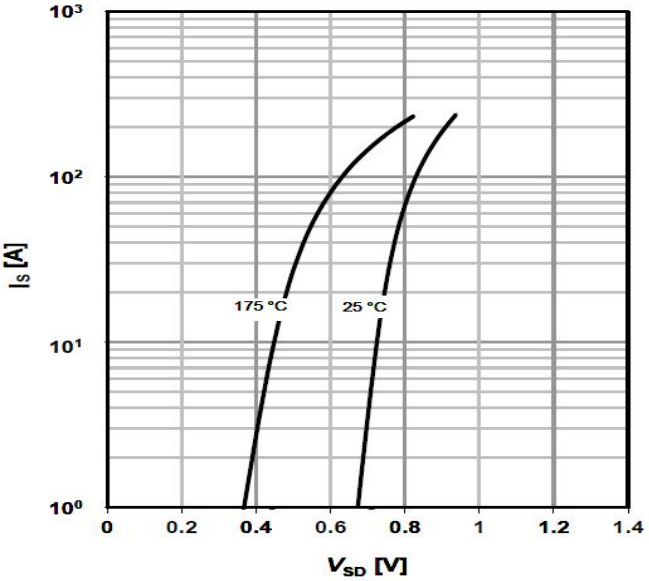
ID -- VGS



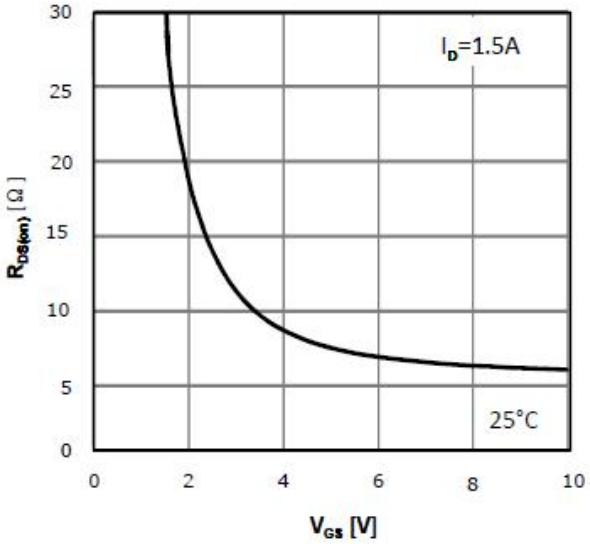
RDS(on) -- ID



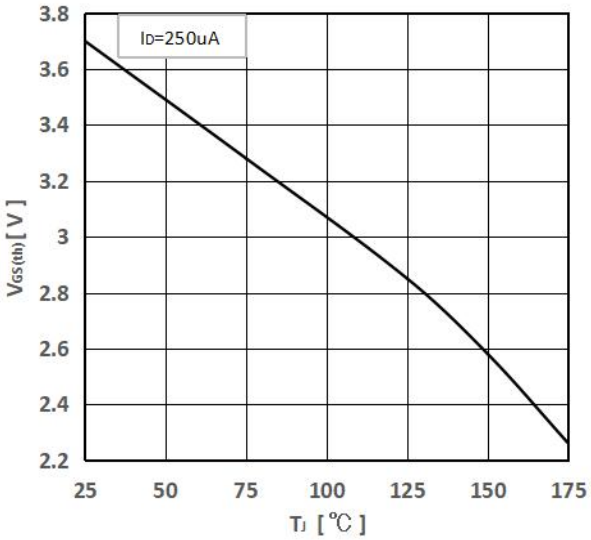
Is -- VSD



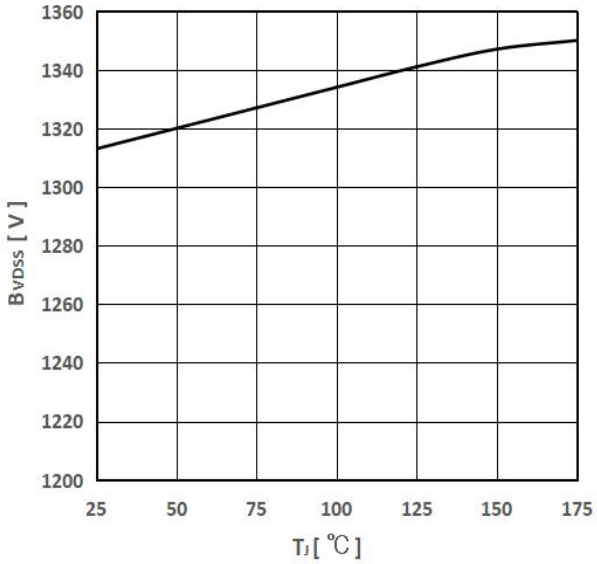
RDS(on) -- VGS



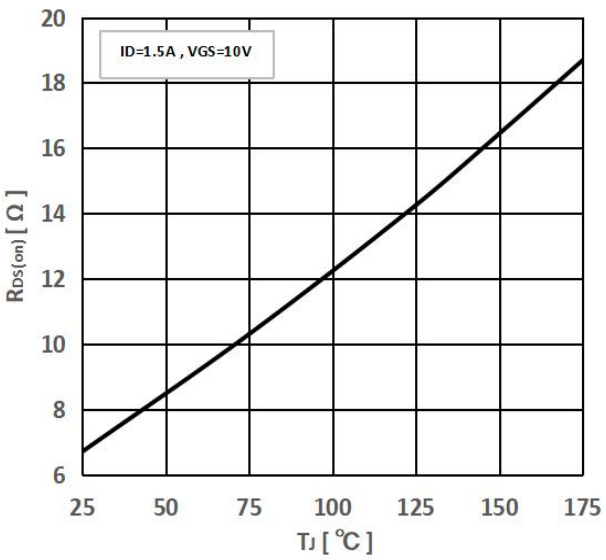
Threshold Voltage



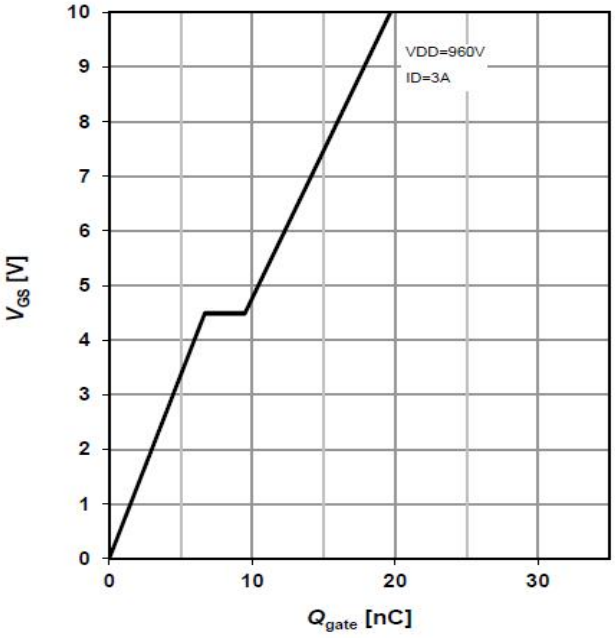
Drain-source breakdown voltage



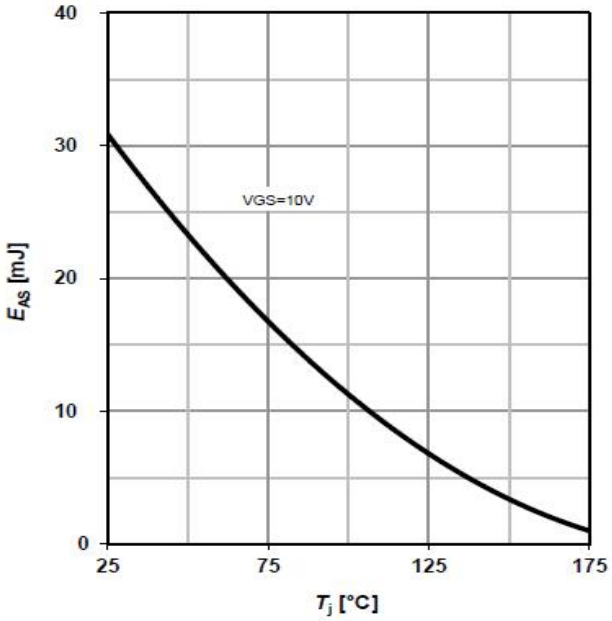
RDS（on） -- Tj



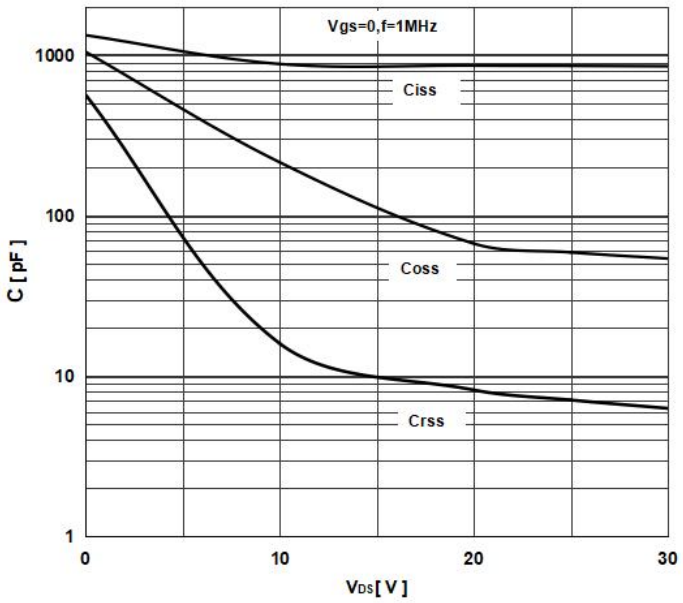
Typ.gate charge



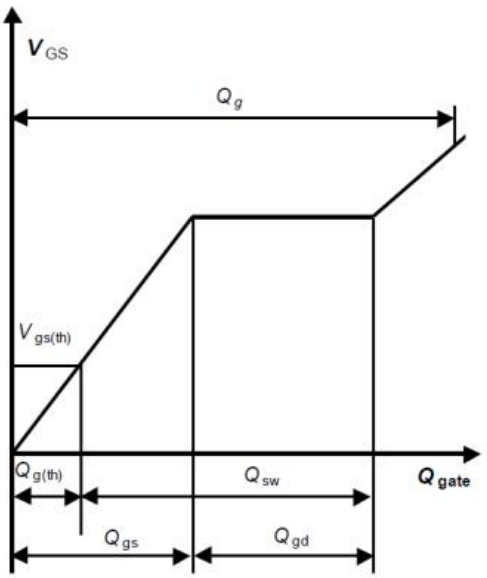
Avalanche energy



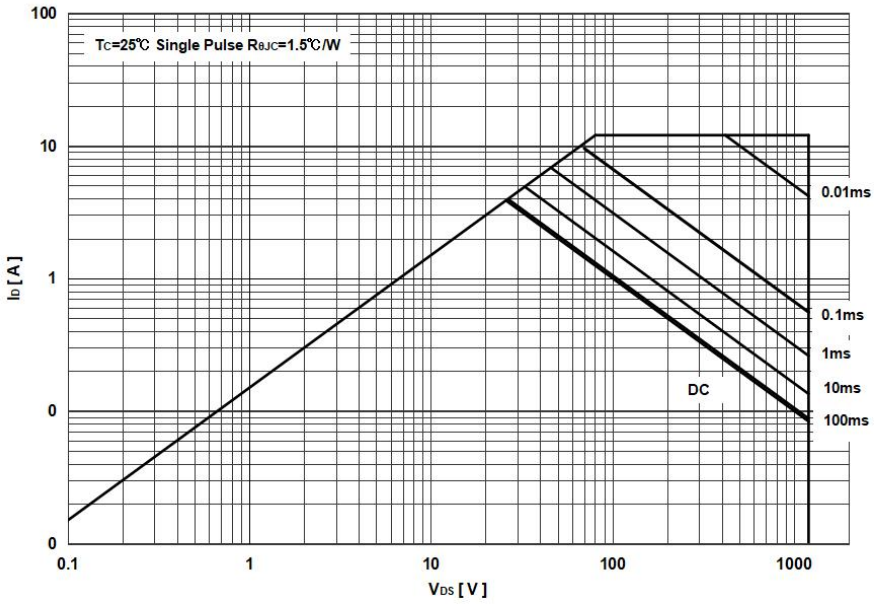
Typ.capacitance



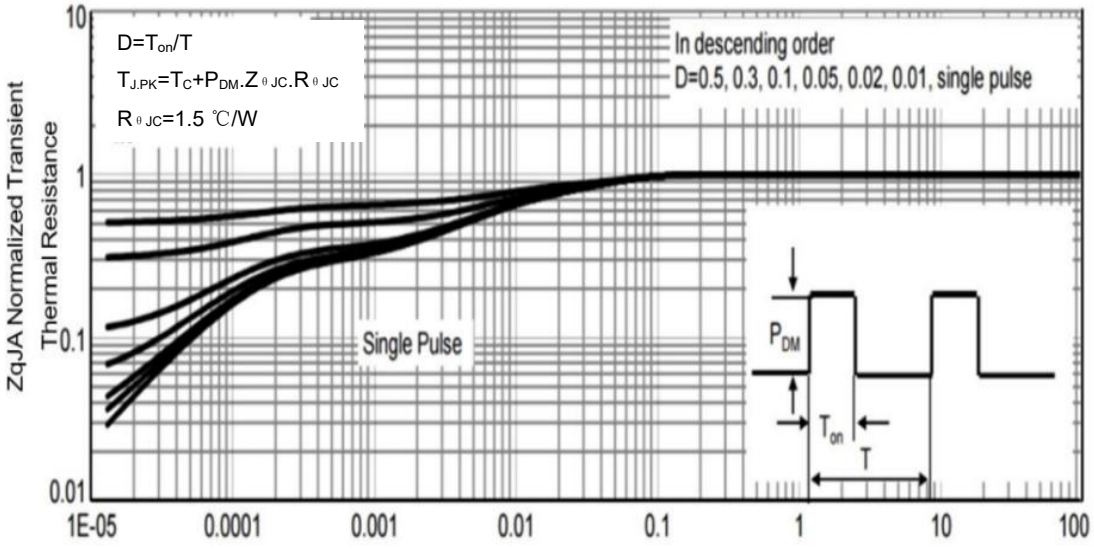
Gate charge waveforms



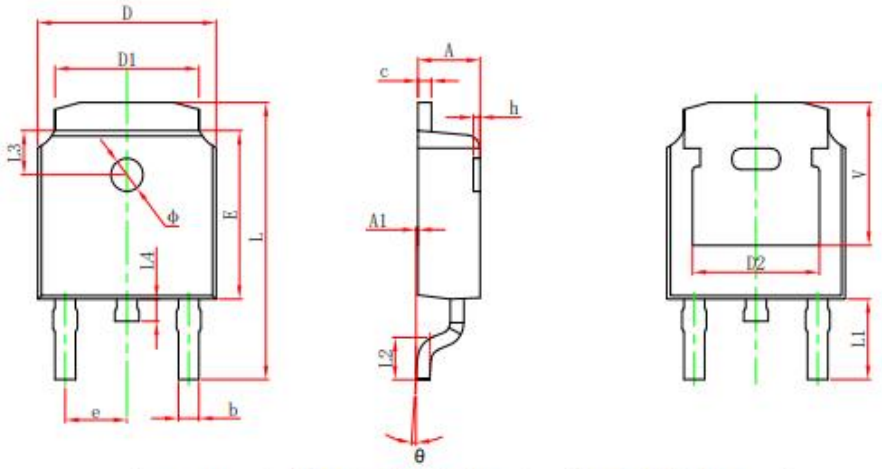
Maximum Forward Biased Safe Operating Area



Normalized Thermal Transient Impedance

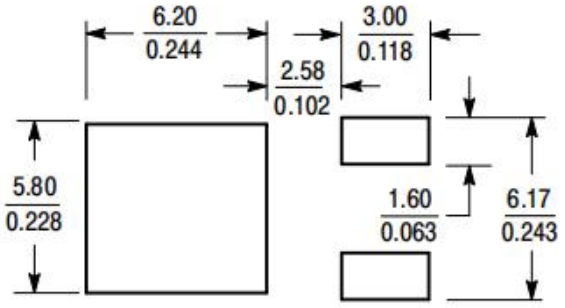


TO-252 Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
b	0.635	0.770	0.025	0.030
c	0.460	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.100	5.460	0.201	0.215
D2	4.830 REF.		0.190 REF.	
E	6.000	6.200	0.236	0.244
e	2.186	2.386	0.086	0.094
L	9.712	10.312	0.382	0.406
L1	2.900 REF.		0.114 REF.	
L2	1.400	1.700	0.055	0.067
L3	1.600 REF.		0.063 REF.	
L4	0.600	1.000	0.024	0.039
Φ	1.100	1.300	0.043	0.051
θ	0°	8°	0°	8°
h	0.000	0.300	0.000	0.012
V	5.250 REF.		0.207 REF.	

TO-252 Suggested Pad Layout



Note:
1. Controlling dimension：in millimeters.
2. General tolerance:0.5mm.
3. The pad layout is for reference purposes only.

NOTICE

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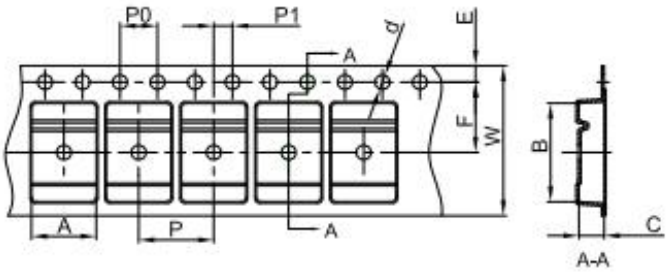
TO-252-2L Tape and Reel

TO-252 Embossed Carrier Tape

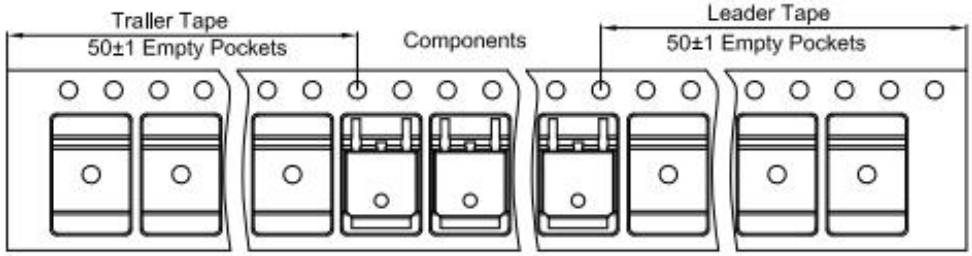


Packaging Description:

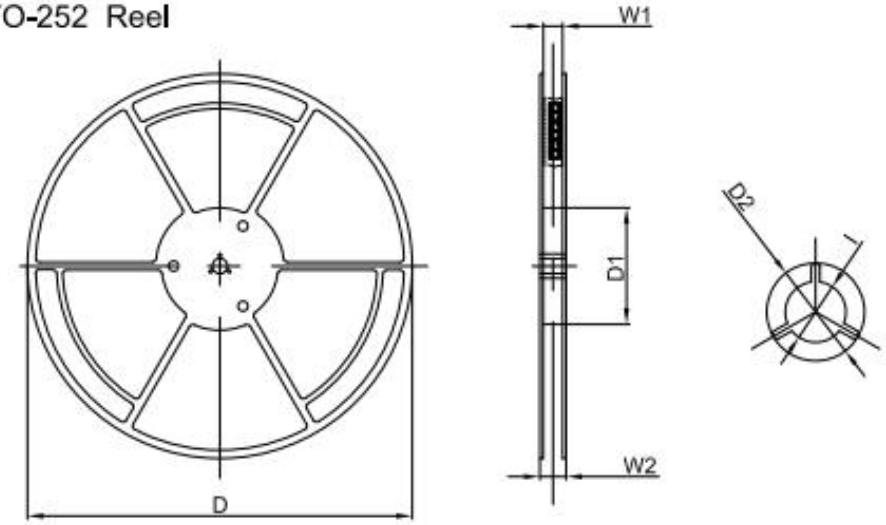
TO-252 parts are shipped in tape. The carrier tape is made from a dissipative (carbon filled) polycarbonate resin. The cover tape is a multilayer film (Heat Activated Adhesive in nature) primarily composed of polyester film, adhesive layer, sealant, and anti-static sprayed agent. These reeled parts in standard option are shipped with 25,00 units per 13" or 33.0 cm 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
TO-252	6.90	10.50	2.70	Ø1.55	1.75	7.50	4.00	8.00	2.00	16.00

TO-252 Tape Leader and Trailer



TO-252 Reel



Dimensions are in millimeter						
Reel Option	D	D1	D2	W1	W2	I
13"Dia	330.00	100.00	Ø21.00	16.40	21.00	Ø13.00

REEL	Reel Size	Box	Box Size(mm)	Carton	Carton Size(mm)	G.W.(kg)
2,500 pcs	13Inch	2,500 pcs	340×336×29	25,000 pcs	353×346×365	

Date of change	Rev #	revise content
2022/11/22	A/0	/