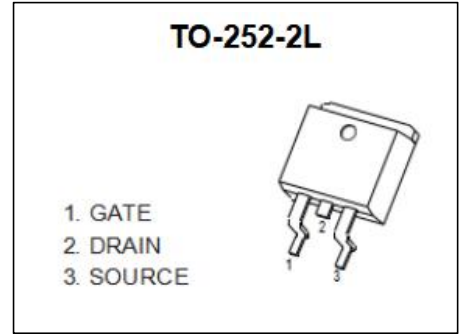




CHONGQING CLOUDCHILD TECHNOLOGY CO.,LTD
TO-252-2L Plastic-Encapsulate MOSFETS

CCM90N4-C **N-Channel Power MOSFET**

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
40 V	1.8mΩ@10V	90A



DESCRIPTION

The CCM90N4-C uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. It can be used in a wide variety of applications .

FEATURES

- Excellent package for good heat dissipation
- Ultra low gate charge
- Low reverse transfer capacitance
- Fast switching capability
- Avalanche energy specified
- AEC Q101 qualified

APPLICATIONS

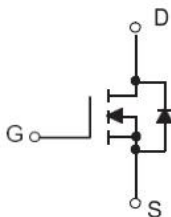
- Power switching application

MARKING



CCM90N4-C =Part No.
 XXXXXXX = Code.

EQUIVALENT CIRCUIT



ABSOLUTE MAXIMUM RATINGS($T_c=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	40	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ¹	I_D	90	A
Pulsed Drain Current ²	I_{DM}	360	A
Single Pulse Avalanche Energy ³	EAS	400	mJ
Total Power Dissipation	P_D	150	W
Thermal Resistance from Junction to Case ²⁴	$R_{\theta JC}$	1.0	$^{\circ}\text{C}/\text{W}$
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55~ +175	$^{\circ}\text{C}$
Soldering Temperature , for 10S(1.6mm from case)	-	260	$^{\circ}\text{C}$

Notes:

1. Current is limited by bondwire, with an $R_{\theta JC}=1.0^{\circ}\text{C}/\text{W}$ the chip is able to carry 210A at 25°C .
2. Defined by design. Not subject to production test.
3. EAS condition: $V_{DD}=20\text{V}, V_{GS}=10\text{V}, I_{as}=40\text{A}, L=0.5\text{mH}, R_g=25\Omega$ Starting $T_J=25^{\circ}\text{C}$.
4. The value of $R_{\theta JC}$ is measured with the device mounted on 1 in 2 FR-4 board with 2oz. Copper, in a still air environment with $T_a=25^{\circ}\text{C}$.

MOSFET ELECTRICAL CHARACTERISTICS

TC=25°C unless otherwise specified

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Off characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	40			V
Zero gate voltage drain current	I_{DSS}	$V_{DS} = 40V, V_{GS} = 0V, T_J = 25^\circ C$			1	μA
Gate-body leakage current	I_{GSS}	$V_{DS} = 0V, V_{GS} = \pm 20V$			± 100	nA
On characteristics						
Gate-threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	2.0	2.7	4.0	V
Static drain-source on-state resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 90A$		1.8	2.2	m Ω
Forward transconductance	g_{fs}	$V_{DS} = 10V, I_D = 10A$		65		S
Dynamic characteristics²						
Input capacitance	C_{iss}	$V_{DS} = 25V, V_{GS} = 0V, f = 1MHz$		4972	6464	pF
Output capacitance	C_{oss}			996	1300	
Reverse transfer capacitance	C_{rss}			32	42	
Gate resistance	R_g	$f = 1MHz$		1.6		Ω
Switching characteristics²						
Total gate charge	Q_g	$V_{GS} = 0-10V, V_{DD} = 32V, I_D = 90A$		92	120	nC
Gate-source charge	Q_{gs}			38	50	
Gate-drain charge	Q_{gd}			16	25	
Turn-on delay time	$t_{d(on)}$	$V_{DD} = 20V, I_D = 90A, V_{GS} = 10V, R_G = 3.5\Omega$		23		ns
Turn-on rise time	t_r			12		
Turn-off delay time	$t_{d(off)}$			30		
Turn-off fall time	t_f			25		
Drain-Source Diode Characteristics²						
Drain-source diode forward voltage	V_{SD}	$V_{GS} = 0V, I_S = 90A$			1.2	V
Continuous drain-source diode forward Current ¹	I_S	-			90	A
Pulsed drain-source diode forward current	I_{SM}	-			360	A
Reverse recovery time	T_{rr}	$I_F = 50A, V_R = 20V, di/dt = 100A/us$		53		ns
Reverse recovery charge	Q_{rr}			60		nC

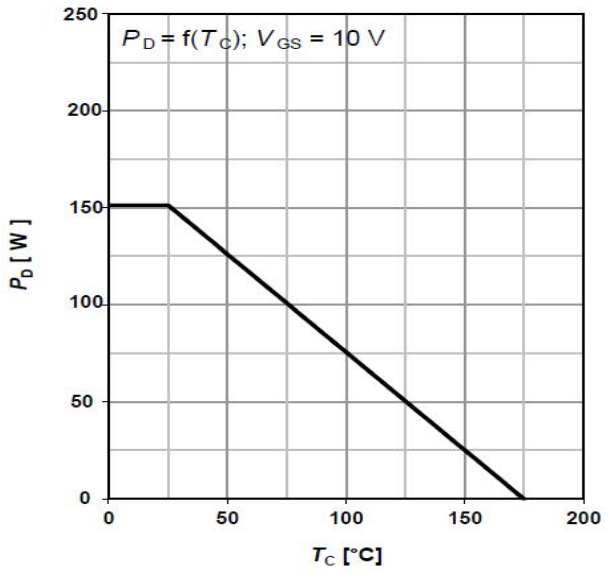
Note :

1.Current is limited by bondwire, with an $R_{\theta JC} = 1.0^\circ C/W$ the chip is able to carry 210A at 25°C.

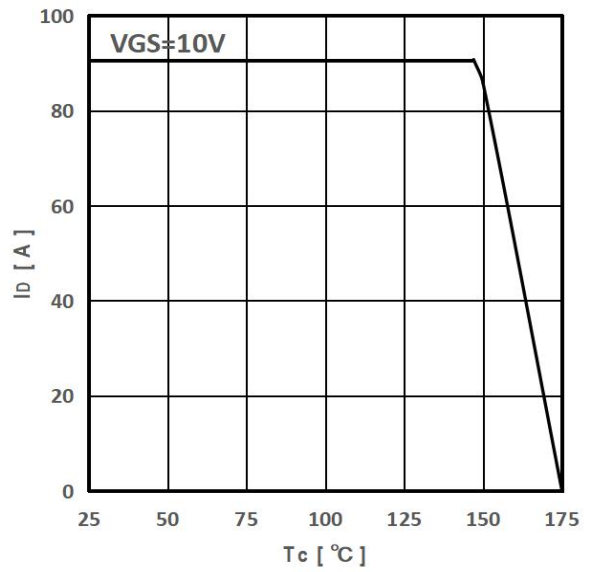
2. Defined by design. Not subject to production test.

Typical Characteristics

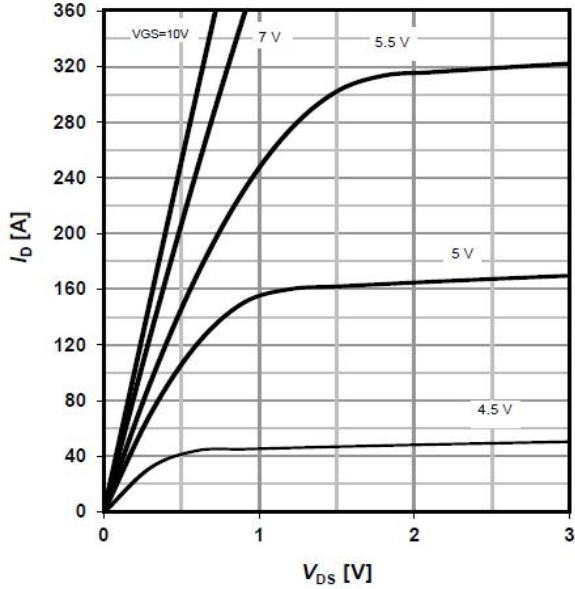
PD -- Tc



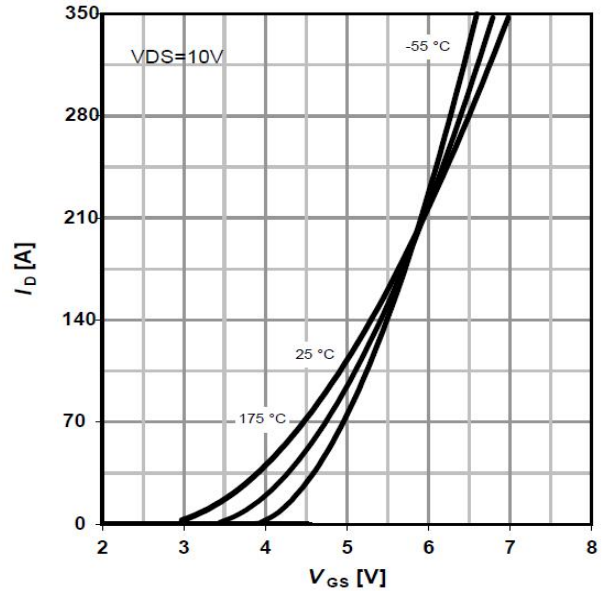
ID -- Tc



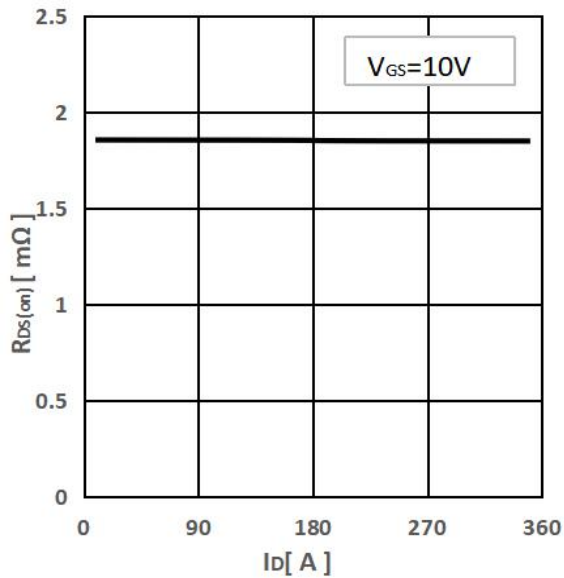
ID -- VDS



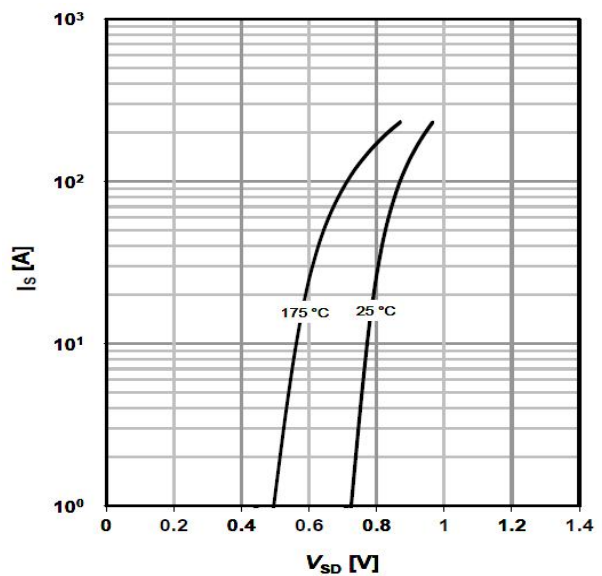
ID -- VGS



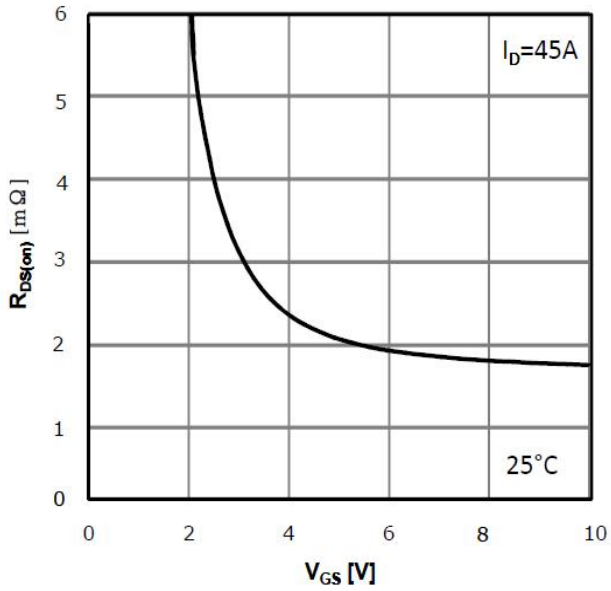
RDS(on) -- ID



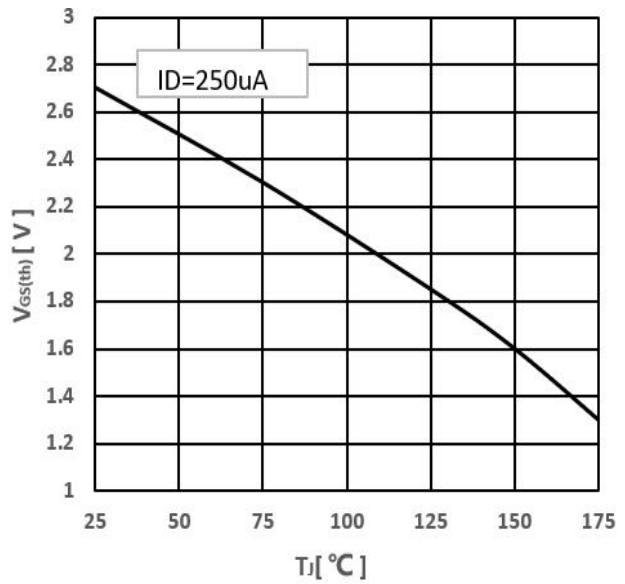
IS -- VSD



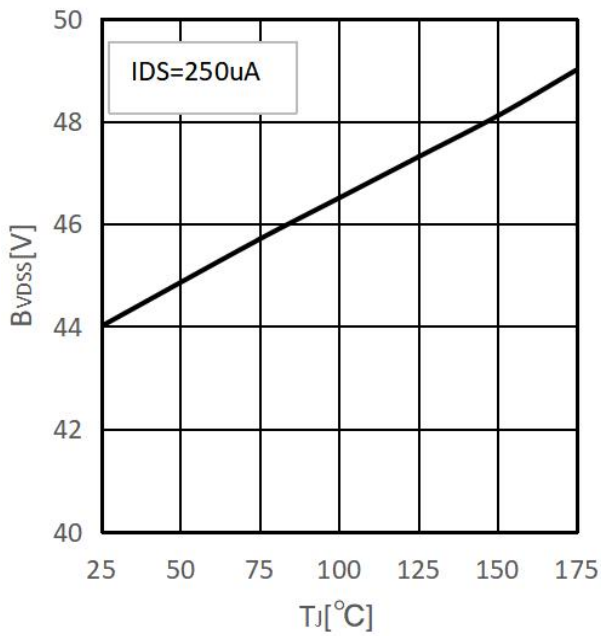
RDS(on) -- VGS



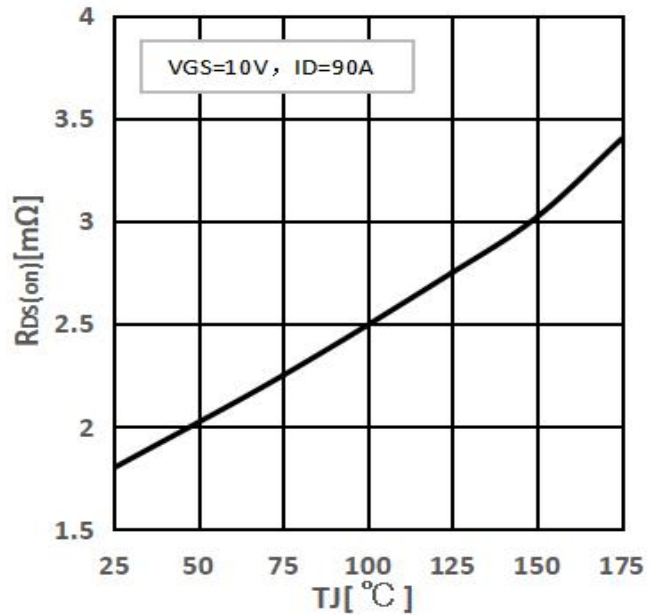
Threshold Voltage



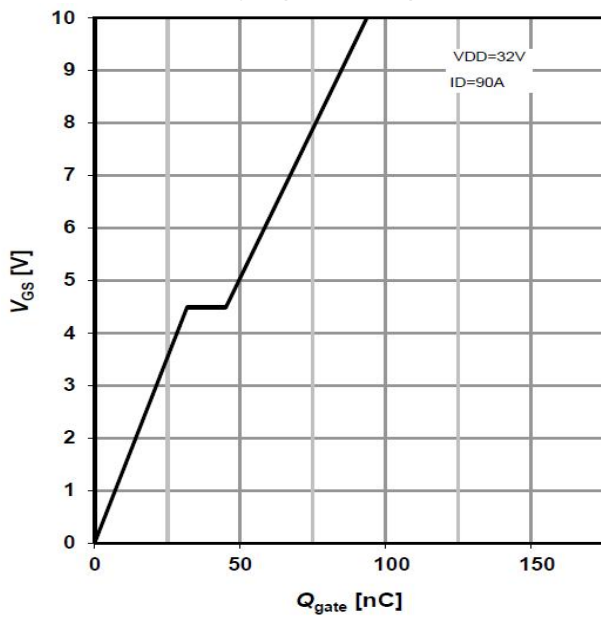
Drain-source breakdown voltage



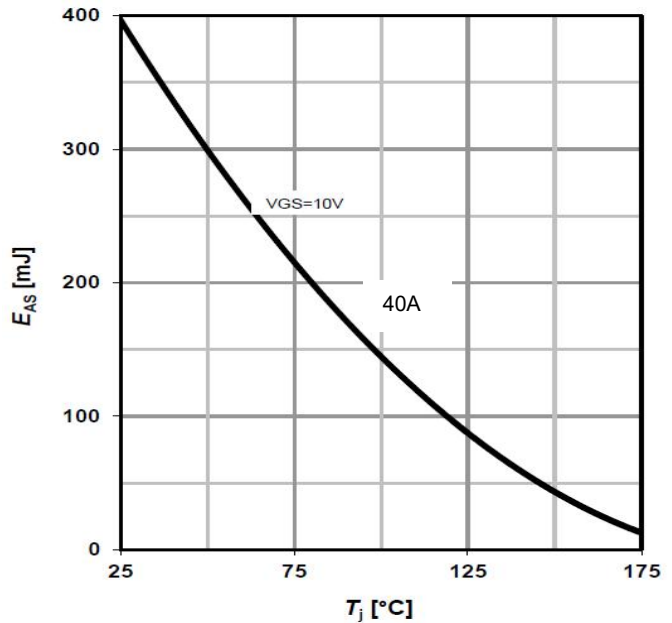
RDS (on) -- TJ



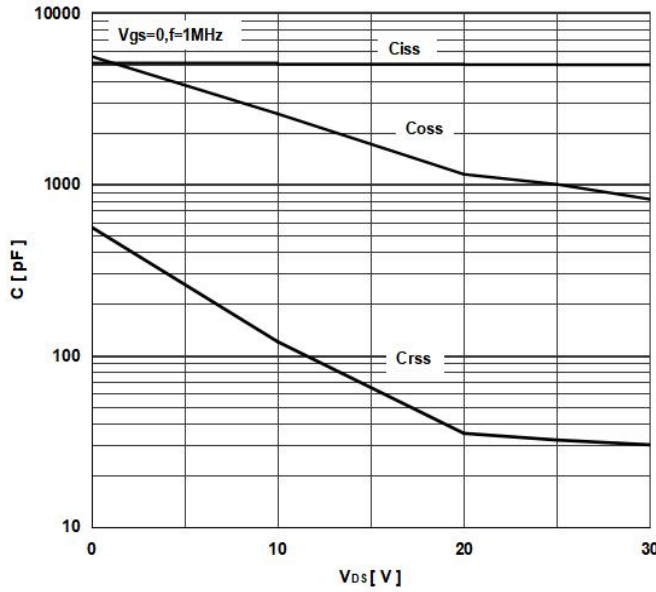
Typ.gate charge



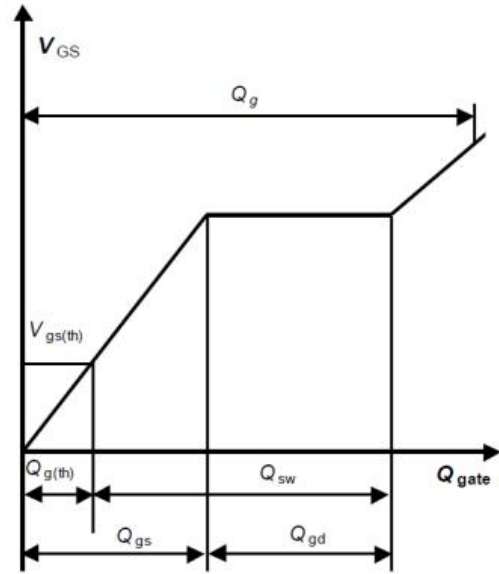
Avalanche energy



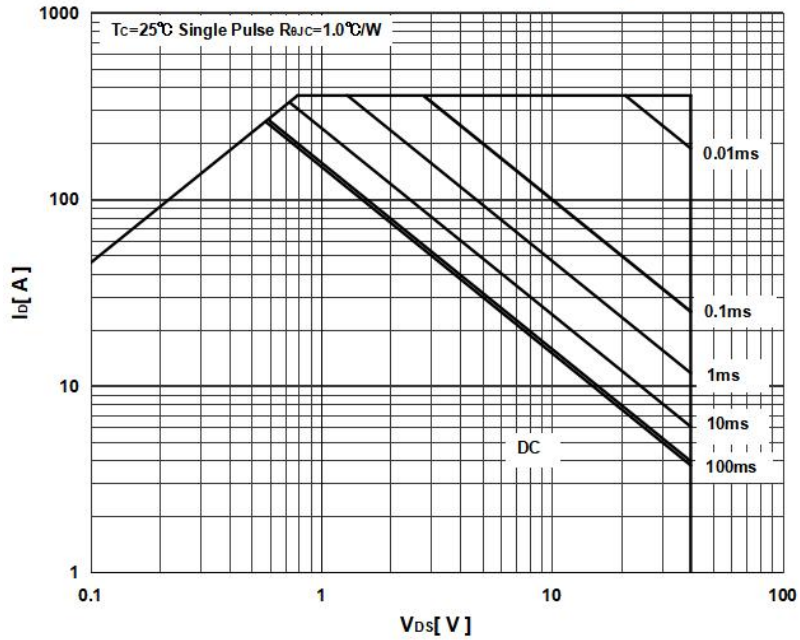
Typ. capacitance



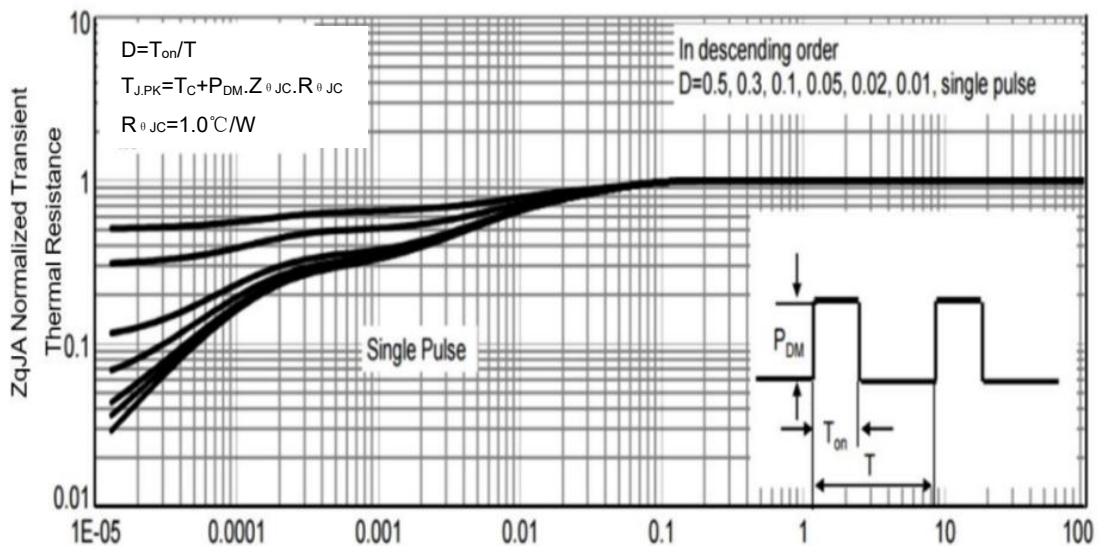
Gate charge waveforms



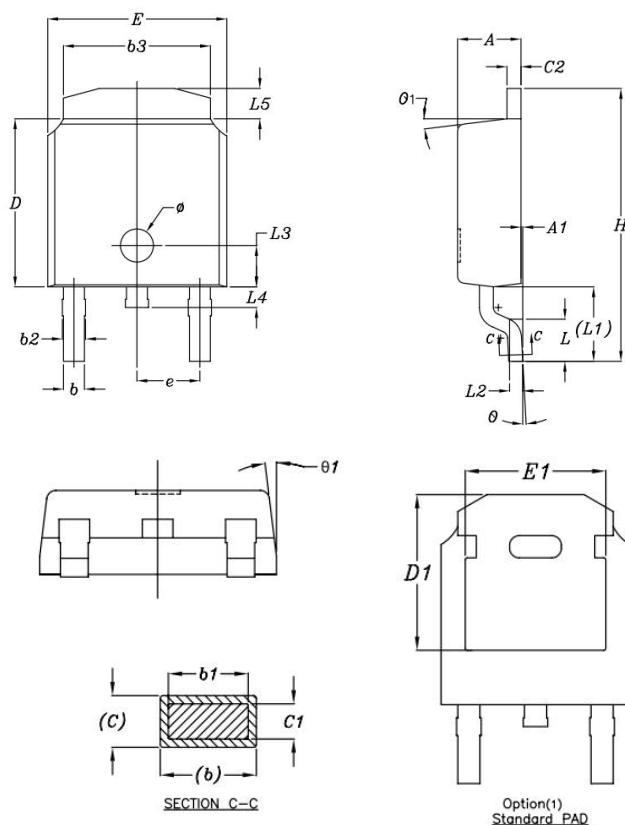
Maximum Forward Biased Safe Operating Area



Normalized Thermal Transient Impedance

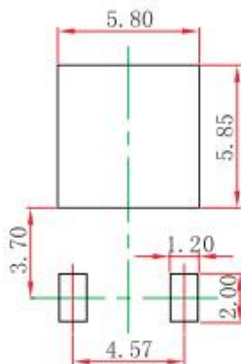


TO-252-2L Package Outline Dimensions



I T E M	DIMENSIONS			
	MILLMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	2.18	2.39	0.086	0.094
A1	—	0.13	—	0.005
b	0.70	0.89	0.028	0.035
b1	0.70	0.86	0.028	0.034
b2	0.76	1.14	0.030	0.045
b3	4.95	5.46	0.195	0.215
c	0.46	0.61	0.018	0.024
c1	0.41	0.56	0.016	0.022
c2	0.46	0.89	0.018	0.035
D	5.97	6.22	0.235	0.245
D1	5.21	—	0.205	—
E	6.35	6.73	0.250	0.265
E1	4.32	—	0.170	—
e	2.29 BSC		0.090 BSC	
H	9.40	10.41	0.370	0.410
L	1.40	1.78	0.055	0.070
L1	2.60	2.90	0.102	0.114
L2	0.51 BSC		0.020 BSC	
L3	1.65	1.95	0.065	0.077
L4	0.60	0.90	0.024	0.035
L5	0.89	1.27	0.035	0.050
theta	1°	5°	1°	5°
theta1	7° REF		7° REF	
phi	1.20 REF		1.20 REF	

TO-252-2L Suggested Pad Layout



Note:

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

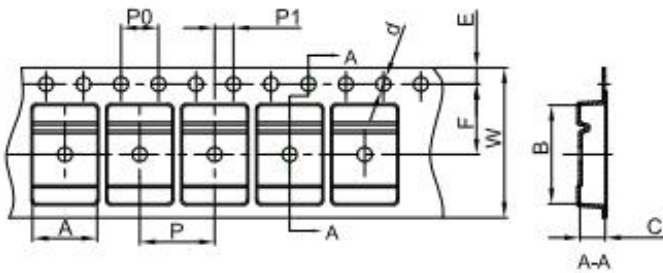
NOTICE

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TO-252-2L Tape and Reel

TO-252 Embossed Carrier Tape



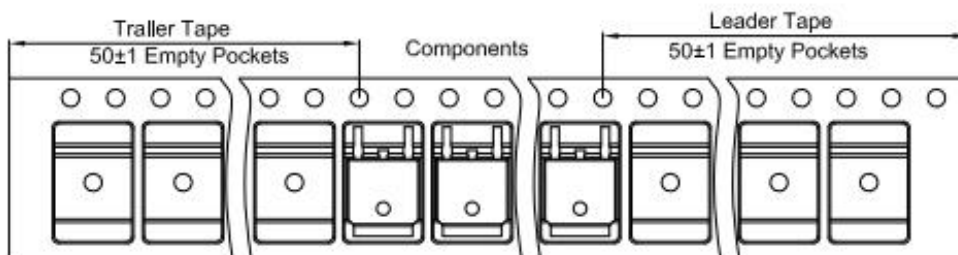
Packaging Description:

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).

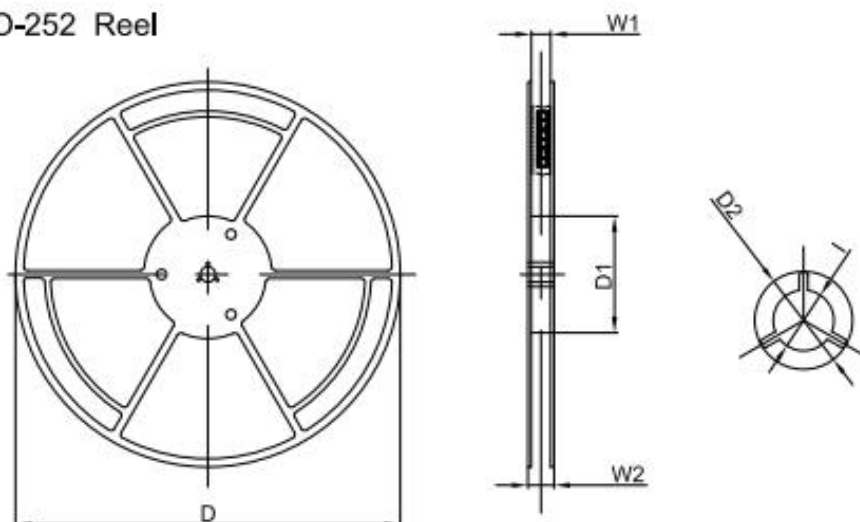
Dimensions are in millimeter

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
2022/12/02	A/0	/
2024/01/08	A/1	产品升级，提高Vth