



CHONGQING CLOUDCHILD TECHNOLOGY CO.,LTD
TO-263-2L Plastic-Encapsulate MOSFETS

CCM110N4-A N-Channel Power MOSFET

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
40 V	3.5mΩ@10V	110A
	4.5mΩ@4.5V	

DESCRIPTION

The CCM110N4-A 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 .

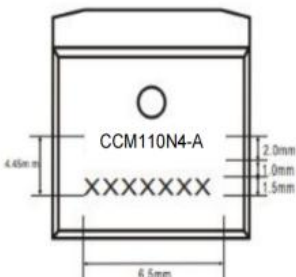
FEATURES

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

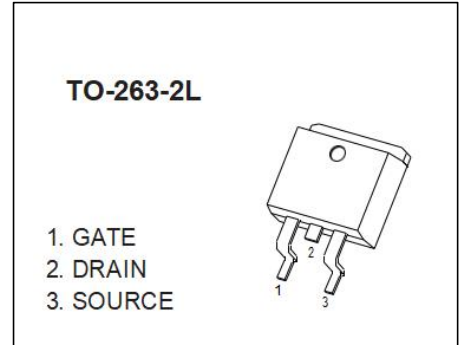
APPLICATIONS

- Power switching application

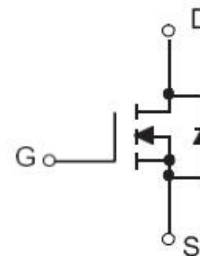
MARKING



CCM110N4-A =Part No.
 XXXXXXXX = 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	110	A
Pulsed Drain Current ²	I_{DM}	440	A
Single Pulse Avalanche Energy ³	E_{AS}	361	mJ
Total Power Dissipation ¹	P_D	115	W
Thermal Resistance from Junction to Case ¹	$R_{\theta JC}$	1.3	$^{\circ}\text{C}/\text{W}$
Thermal Resistance from Junction to Ambient ⁴	$R_{\theta JA}$	62	$^{\circ}\text{C}/\text{W}$
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. $T_c=25^{\circ}\text{C}$ Limited only by maximum temperature allowed.
2. $P_W \leq 10\mu\text{s}$, Duty cycles $\leq 1\%$.
3. EAS condition: $V_{DD}=20\text{V}, V_{GS}=10\text{V}, I_D=38\text{A}, L=0.5\text{mH}, R_g=25\Omega$ Starting $T_J = 25^{\circ}\text{C}$.
4. The value of $R_{\theta JA}, R_{\theta JC}$ 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

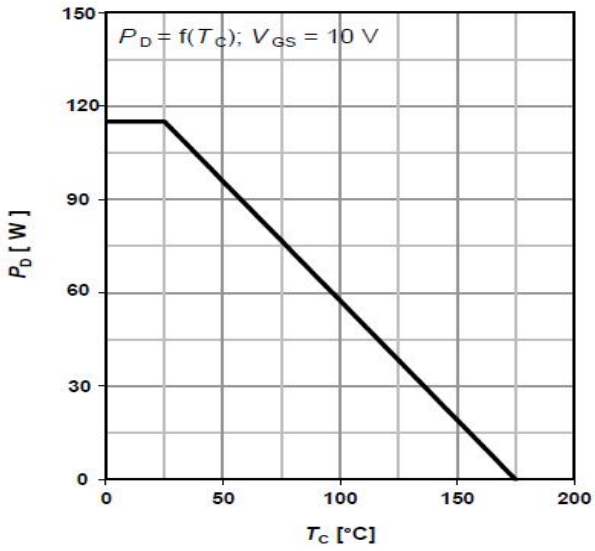
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Off characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	40			V
Zero gate voltage drain current	I_{DSS}	$V_{DS} = 32V, V_{GS} = 0V$	$T_J = 25^\circ C$		1	μA
			$T_J = 125^\circ C$		10	
Gate-body leakage current	I_{GSS}	$V_{DS} = 0V, V_{GS} = \pm 20V$			± 100	nA
On characteristics⁴						
Gate-threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	1.5	1.7	2.5	V
Static drain-source on-state resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 40A$		3.5	4.5	m Ω
			$V_{GS} = 4.5V, I_D = 40A$		4.5	5.0
Forward transconductance	g_{fs}	$V_{DS} = 10V, I_D = 10A$		70		S
Dynamic characteristics³⁴						
Input capacitance	C_{iss}	$V_{DS} = 25V, V_{GS} = 0V, f = 1MHz$		5900		pF
Output capacitance	C_{oss}			426		
Reverse transfer capacitance	C_{rss}			353		
Gate resistance	R_g	$f = 1MHz$		1.9		Ω
Switching characteristics³⁴						
Total gate charge	Q_g	$V_{GS} = 10V, V_{DD} = 32V, I_D = 10A$		26		nC
Gate-source charge	Q_{gs}			4.4		
Gate-drain charge	Q_{gd}			8.8		
Turn-on delay time	$t_{d(on)}$	$V_{DD} = 20V, I_D = 1A, V_{GS} = 10V, R_G = 3.3\Omega$		10.3		ns
Turn-on rise time	t_r			5.3		
Turn-off delay time	$t_{d(off)}$			44		
Turn-off fall time	t_f			9.2		
Drain-Source Diode Characteristics						
Drain-source diode forward voltage ⁴	V_{SD}	$V_{GS} = 0V, I_S = 10A$			1.2	V
Continuous drain-source diode forward Current ¹	I_S	-			110	A
Pulsed drain-source diode forward current ²	I_{SM}	-			440	A
Reverse recovery time	T_{rr}	$I_F = 20A, di/dt = 100A/\mu s$		38		ns
Reverse recovery charge	Q_{rr}				28	

Note :

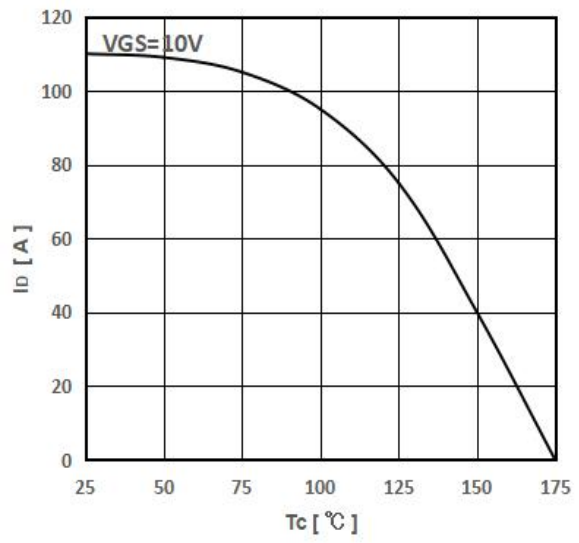
1. $T_C = 25^\circ C$ Limited only by maximum temperature allowed.
2. $P_w \leq 10\mu s$, Duty cycle $\leq 1\%$.
3. Guaranteed by design, not subject to production.
4. Pulse Test : Pulse Width $\leq 300\mu s$, duty cycle $\leq 2\%$.

Typical Characteristics

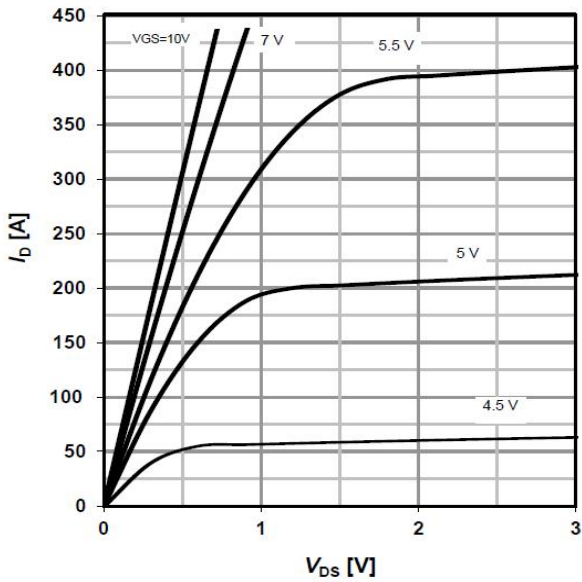
PD -- Tc



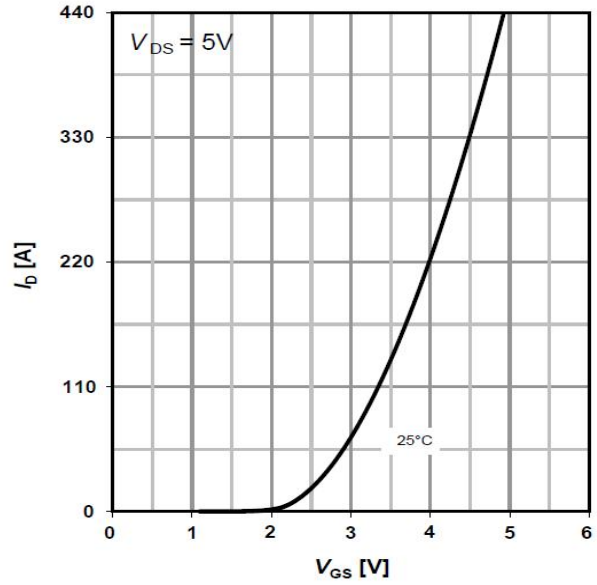
ID -- Tc



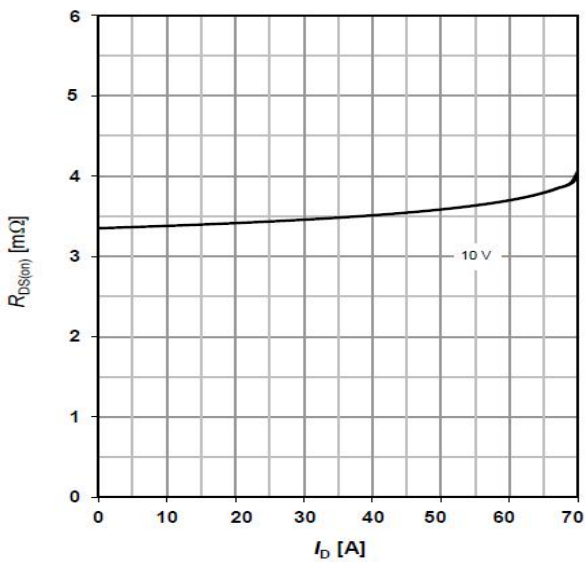
ID -- VDS



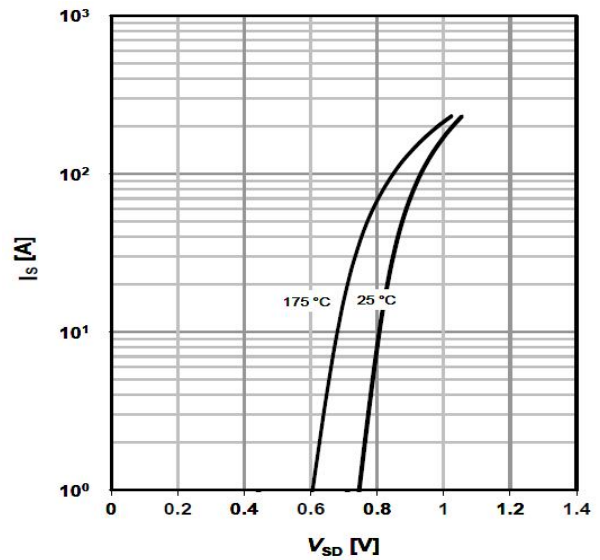
ID -- VGS



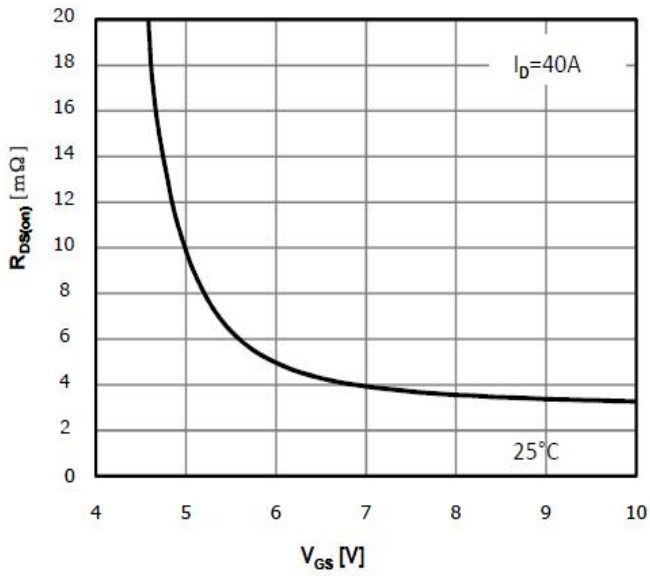
RDS(on) -- ID



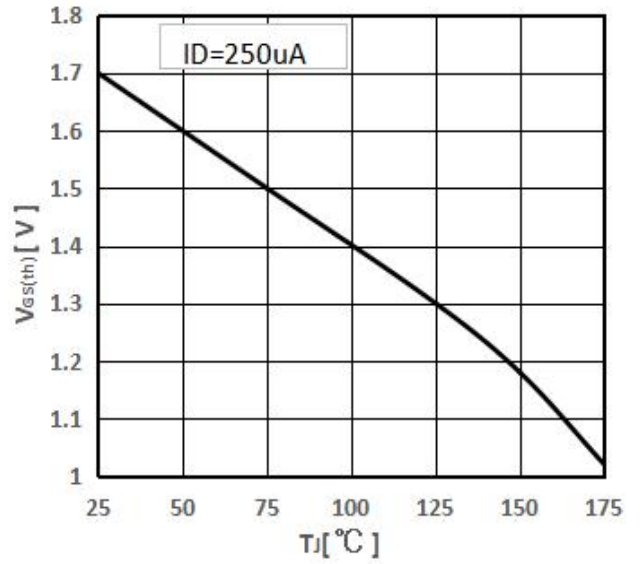
IS -- VSD



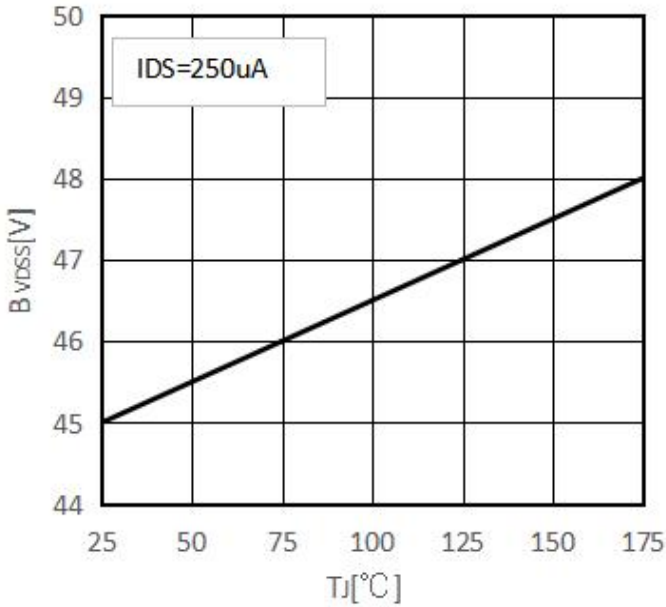
RDS(on) -- VGS



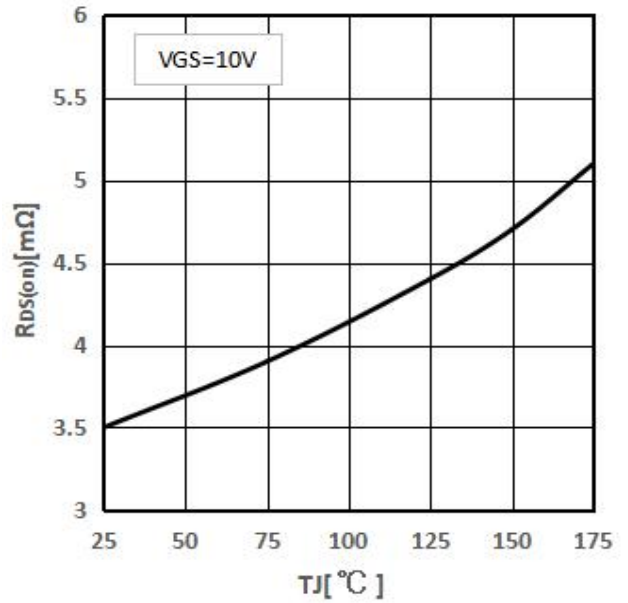
Threshold Voltage



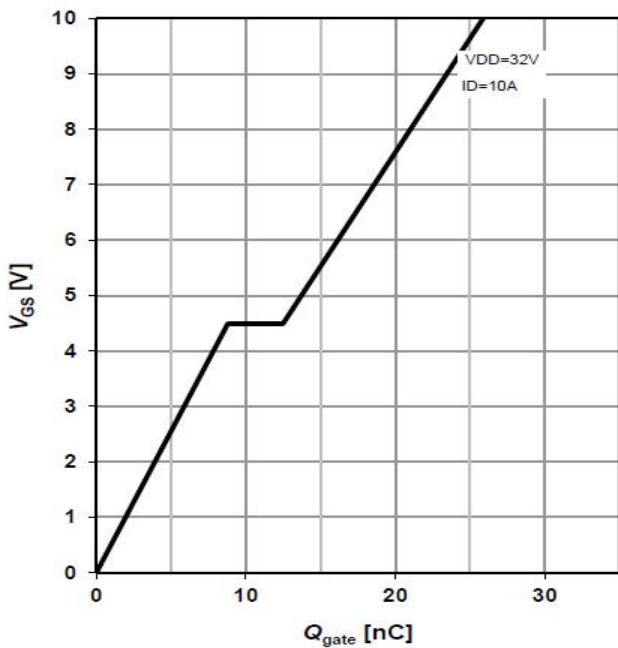
Drain-source breakdown voltage



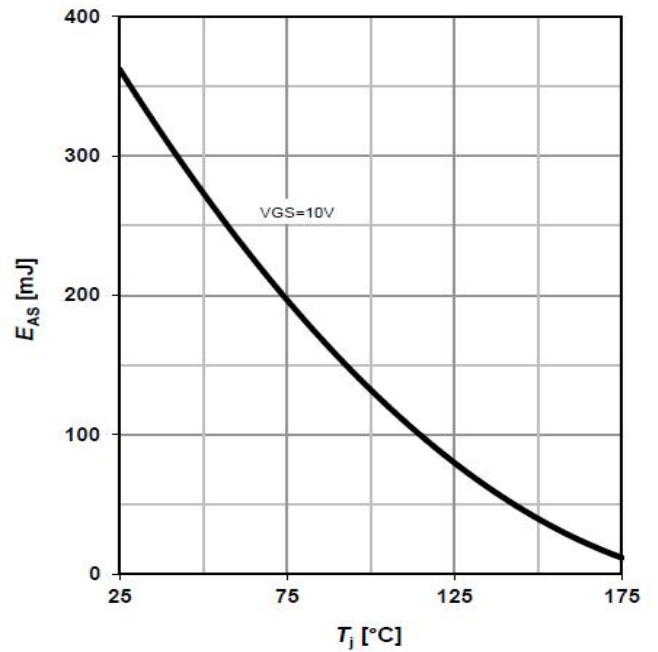
RDS (on) -- Tj



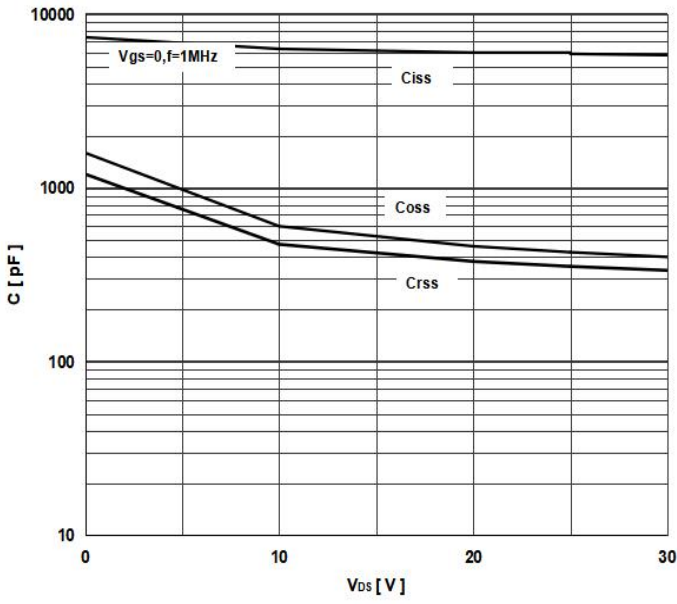
Typ.gate charge



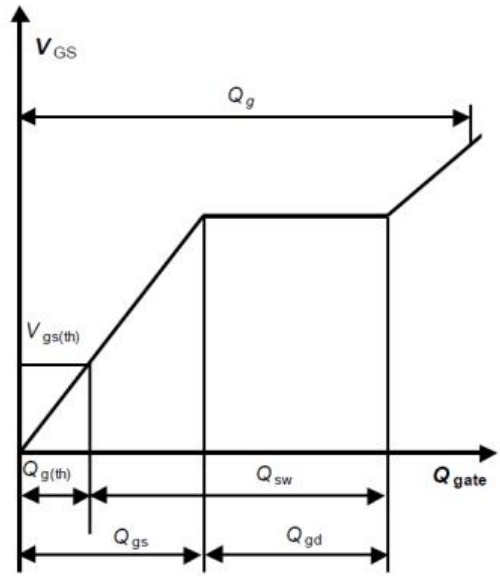
Avalanche energy



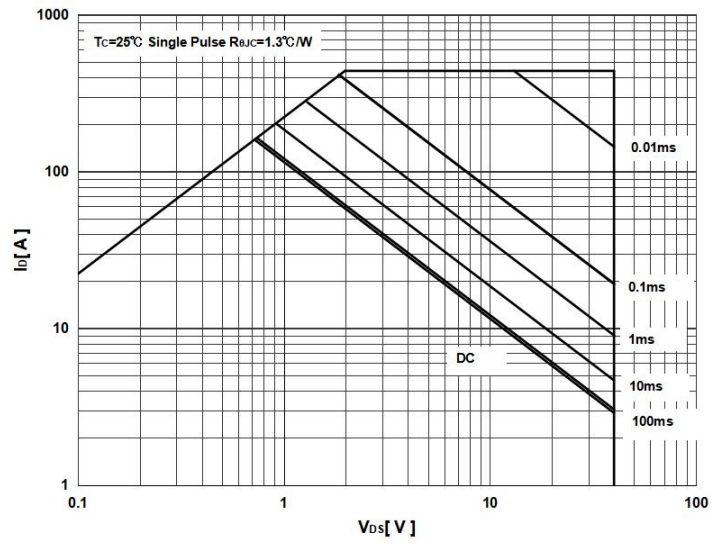
Typ. capacitance



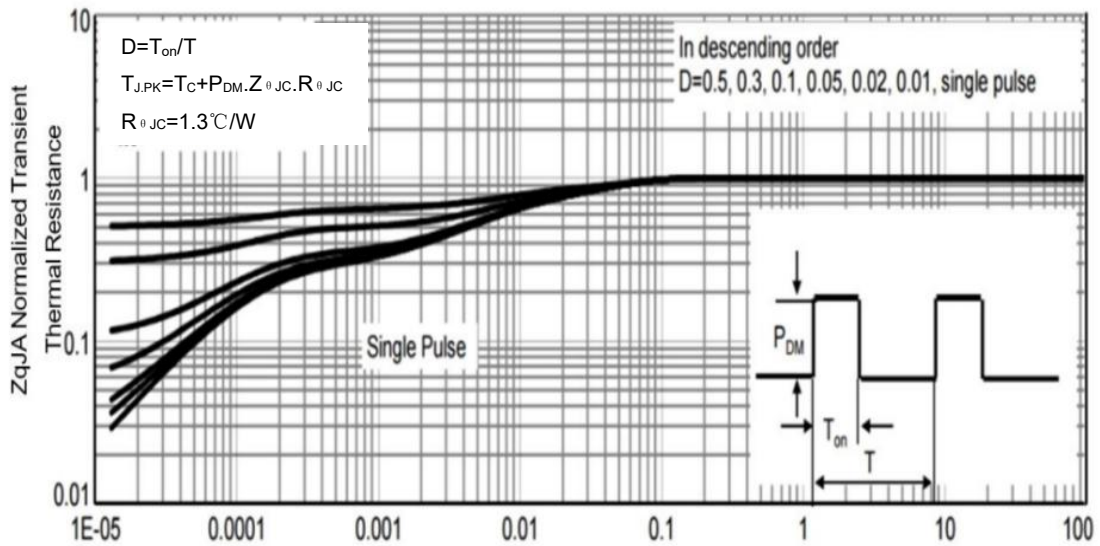
Gate charge waveforms



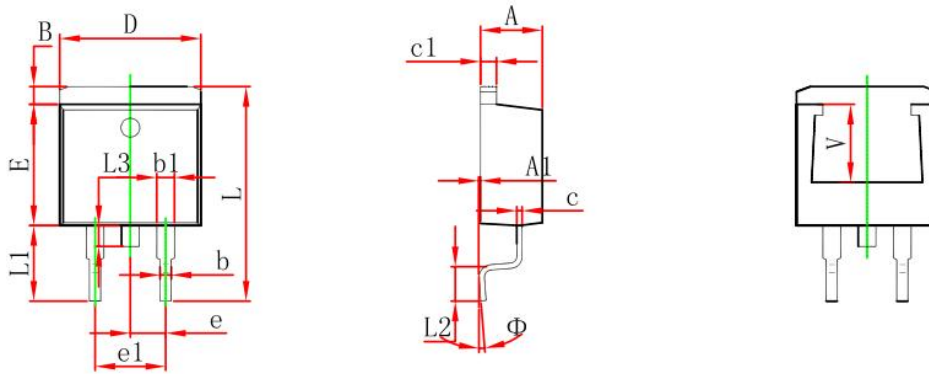
Maximum Forward Biased Safe Operating Area



Normalized Thermal Transient Impedance

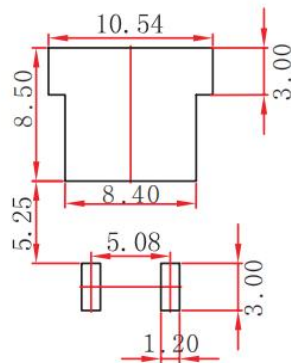


TO-263-2L Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.470	4.670	0.176	0.184
A1	0.000	0.150	0.000	0.006
B	1.120	1.420	0.044	0.056
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.310	0.530	0.012	0.021
c1	1.170	1.370	0.046	0.054
D	10.010	10.310	0.394	0.406
E	8.500	8.900	0.335	0.350
e	2.540 TYP.		0.100 TYP.	
e1	4.980	5.180	0.196	0.204
L	14.940	15.500	0.588	0.610
L1	4.960	5.460	0.195	0.215
L2	2.340	2.740	0.092	0.108
L3	1.300	1.700	0.051	0.067
Φ	0°	8°	0°	8°
V	5.600 REF.		0.220 REF.	

TO-263-2L Suggested Pad Layout



Note:

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

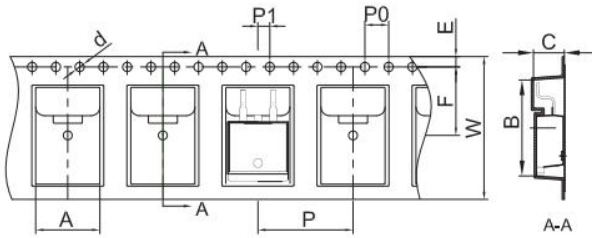
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TO-263-2L Tape and Reel

TO-263-2L Embossed Carrier Tape



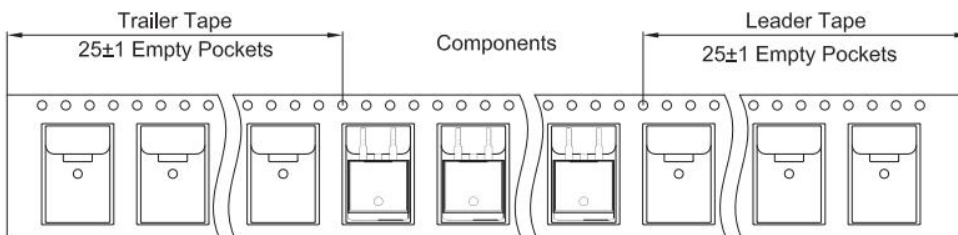
Packaging Description:

TO-263-2L 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 800 units per 13" or 33.0 cm diameter reel. The reels are clear in color and is made of polystyrene plastic (anti-static coated).

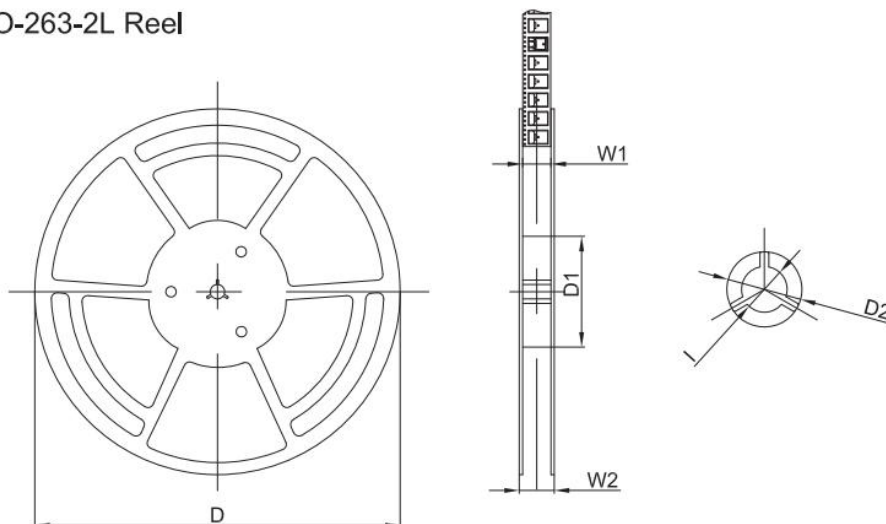
Dimensions are in millimeter

Pkg type	A	B	C	d	E	F	P0	P	P1	W
TO-263-2L	10.80	16.13	5.21	Ø1.55	1.75	11.50	4.00	16.00	2.00	24.00

TO-263-2L Tape Leader and Trailer



TO-263-2L Reel



Dimensions are in millimeter

Reel Option	D	D1	D2	W1	W2	I
13"Dia	Ø330.00	100.00	Ø21.00	24.4	30.4	Ø13.00

REEL	Reel Size	Box	Box Size(mm)	Carton	Carton Size(mm)	G.W.(kg)
800 pcs	13 inch	800 pcs	340×336×36	8,000 pcs	400×353×365	

Date of change	Rev #	revise content
2022/11/16	A/0	/