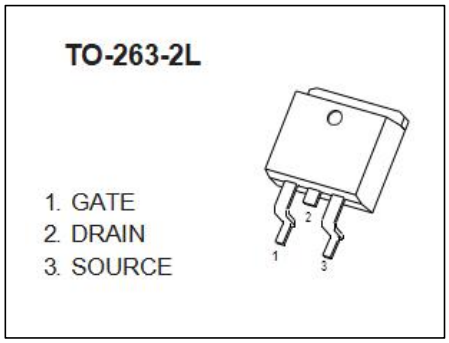
CHONGQING CLOUDCHILD TECHNOLOGY CO., LTD

TO-263-2L Plastic-Encapsulate MOSFETS

CCMA120N10S N-Channel Power MOSFET

$V_{(BR)DSS}$	$R_{DS(on)}$ TYP	I_D
100V	4.2mΩ	120A



DESCRIPTION

The CCMA120N10S uses advanced SGT technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. It can be used in a wide variety of applications.

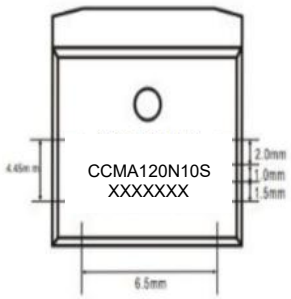
FEATURE

- Extremely low on-resistance $R_{DS(on)}$
- Excellent Qg × $R_{DS(on)}$ product(FOM)
- AEC Q101 qualified

APPLICATION

- Motor control and drive
- Battery management
- UPS (Uninterrupible Power Supplies)

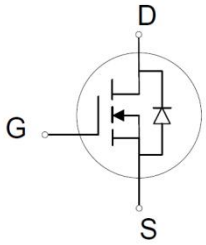
MARKING



CCMA120N10S =Part No.

XXXXXXX = Code

EQUIVALENT CIRCUIT



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

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	±20	V
Continuous Drain Current[1]	I_D	120	A
Pulsed Drain Current[2]	I_{DM}	480	A
Single Pulse AvalancheEnergy[3]	E_{AS}	729	mJ
Total Power Dissipation	P_D	188	W
Thermal Resistance from Junction to Case	$R_{\theta JC}$	0.79	℃/W
Operating Junction and Storage Temperature Range	T_J,T_{STG}	-55~+175	℃
Soldering Temperature , for 10S(1.6mm from case)	-	260	℃

Notes:

1.Current is limited by package; with a Rthjc = 0.79 ℃/W the chip is able to carry 141 A at 25°C.

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

3.EAS condition : Tj=25℃,L=0.5mH,VGS=10V,VDD=50V，ID=54A.

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} = 0 V，I_D = 250 μA	100			V
Zero gate voltage drain current	I_{DSS}	V_{DS} = 100V ，V_{GS} = 0 V			1	μA
Gate-body leakage current	I_{GSS}	V_{DS} = 0 V，V_{GS} = ±20 V			100	nA
On characteristics						
Gate threshold voltage[3]	$V_{GS(th)}$	V_{DS} = V_{GS}，I_D = 250 μA	2.0	3.0	4.0	V
Drain-source on-resistance[3]	$R_{DS(on)}$	V_{GS} = 10 V，I_D = 100 A		4.2	5.6	mΩ
Transconductance	gfs	V_{DS}=10V ，I_D=100A		204		S
Dynamic characteristics[1]						
Input Capacitance	Ciss	V_{DS} = 25 V，V_{GS} = 0 V，f = 1 MHz		4650	6050	pF
Output Capacitance	Coss			2150	2800	
Reverse Transfer Capacitance	Crss			160	220	
Gate resistance	R_g	V_{GS} = 0 V, V_{DS}=0V, f=1MHz		1.7		Ω
Switching characteristics[1]						
Total Gate Charge	Qg	V_{DD} = 50 V，V_{GS} = 10 V，I_D = 100 A， f = 1 MHz		113		nC
Gate-Source Charge	Qgs			38		
Gate-Drain Charge	Qgd			23		
Turn-on delay time	td(on)	V_{DD} = 50 V， V_{GS} = 10 V，I_D = 100 A，R_G = 3.5 Ω		25		ns
Turn-on rise time	tr			15		
Turn-off delay time	td(off)			53		
Turn-off fall time	tf			18		
Drain-Source Diode Characteristics						
Drain-source diode forward Voltage[3]	V_{SD}	V_{GS} =0V, I_{SD} =100A, T_j = 25 °C			1.2	V
Continuous drain-source diode forward current[24]	I_S	Tc = 25 °C			120	A
Pulsed drain-source diode forward current	I_{SM}				480	A
Reverse recovery time	trr	I_F=100A，dI/dt=100A/us		75		ns
Reverse recovery charge	Qrr			163		nC

Notes :

1.Guaranteed by design, not subject to production.

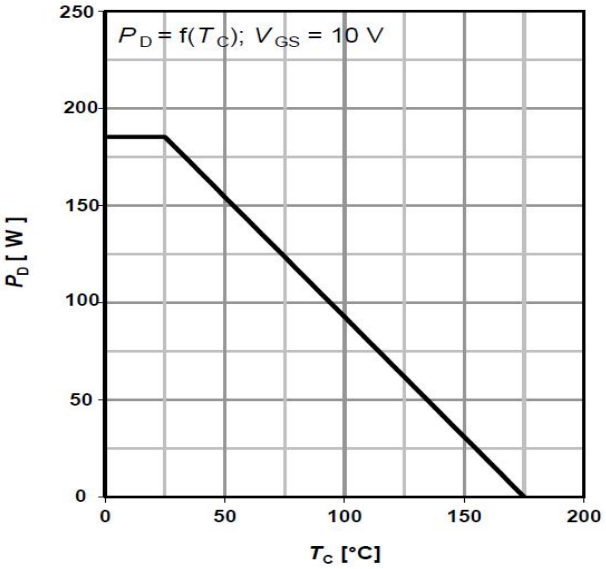
2.Surface Mounted on FR4 Board, t ≤ 10 sec.

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

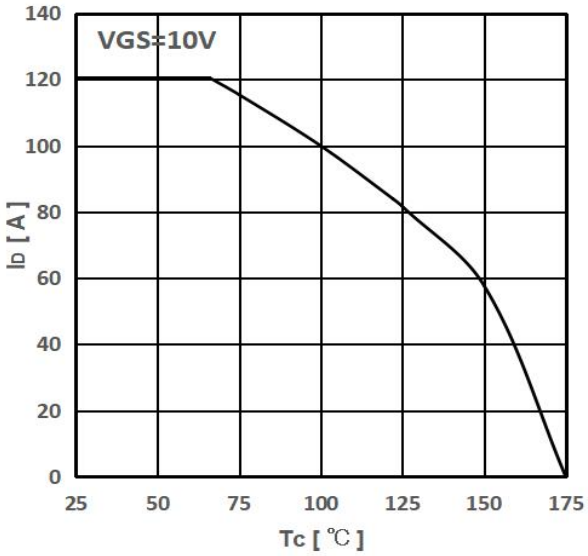
4.Current is limited by package; with a Rthjc = 0.79 ℃/W the chip is able to carry 141 A at 25°C.

Typical Characteristics

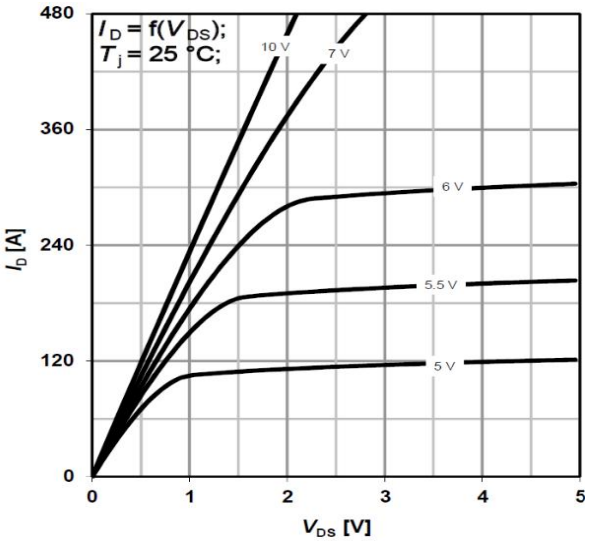
PD -- Tc



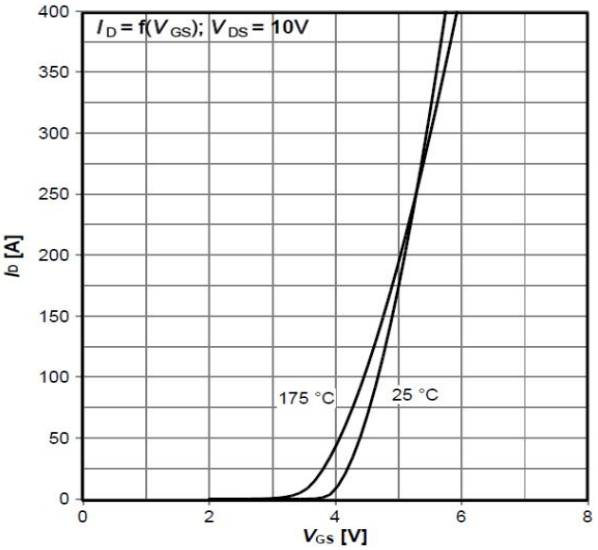
ID -- Tc



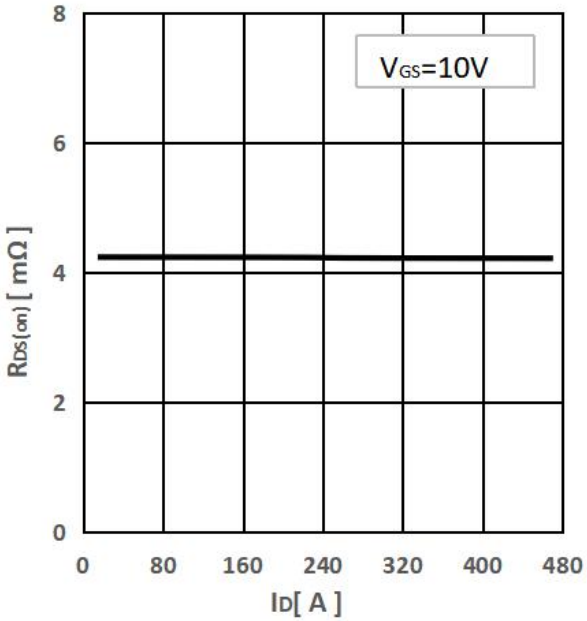
ID -- VDS



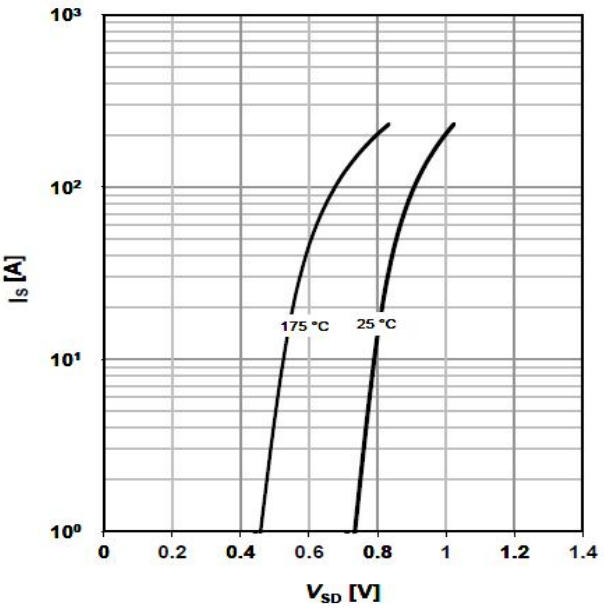
ID -- VGS



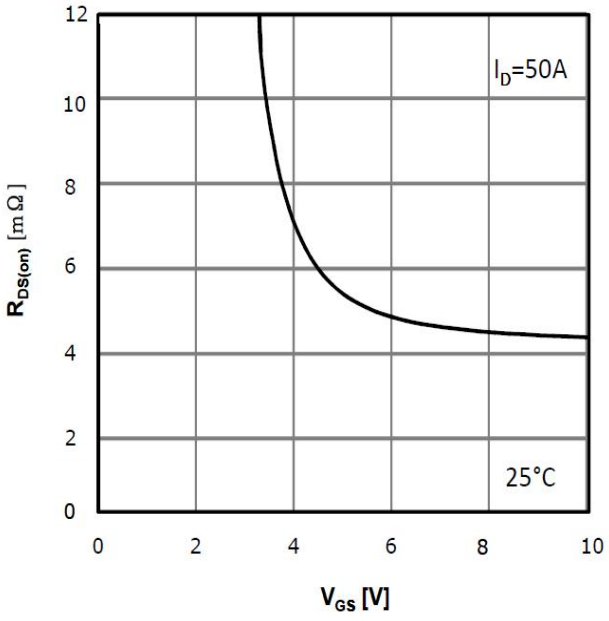
RDS(on) -- ID



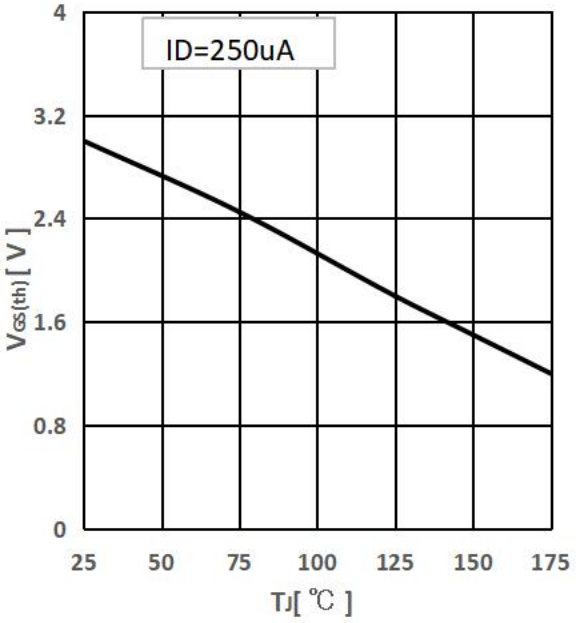
IS -- VSD



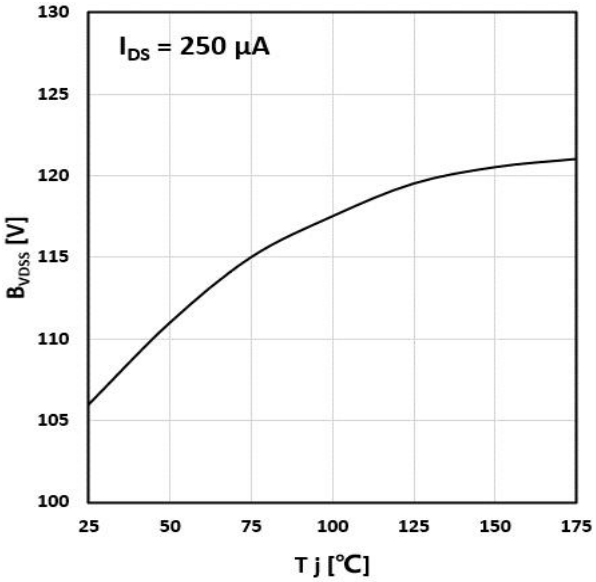
RDS(on) -- VGS



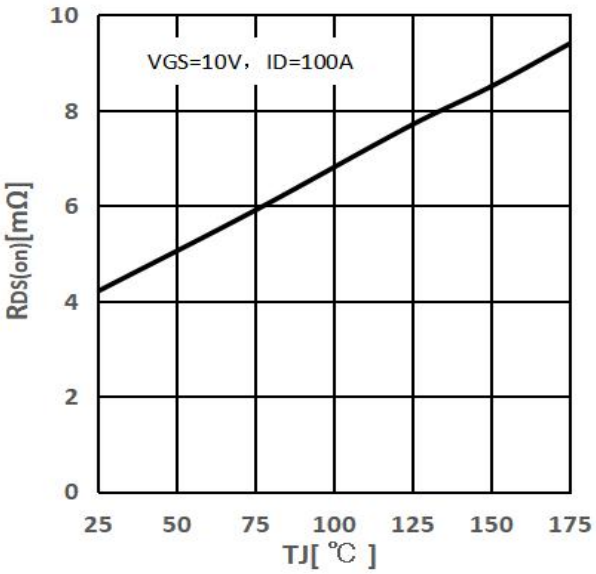
Threshold Voltage



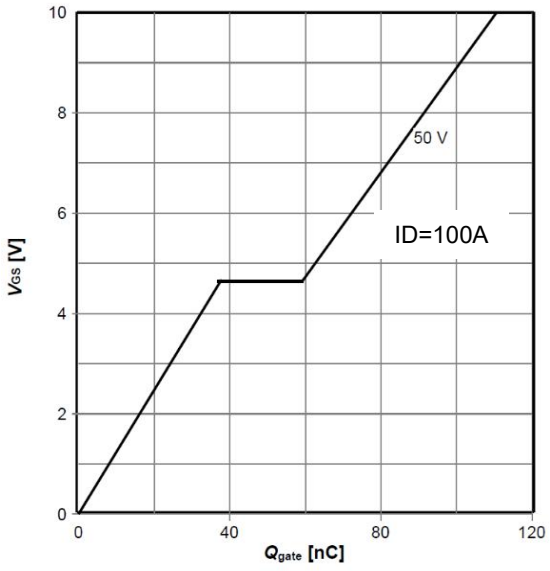
Drain-source breakdown voltage



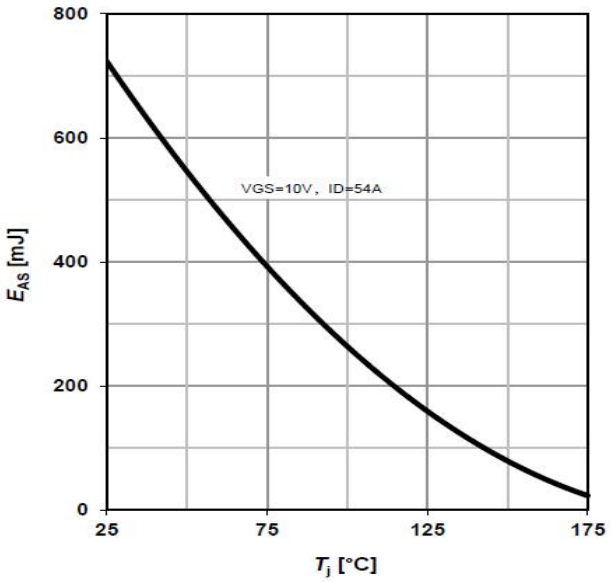
RDS（on） -- Tj



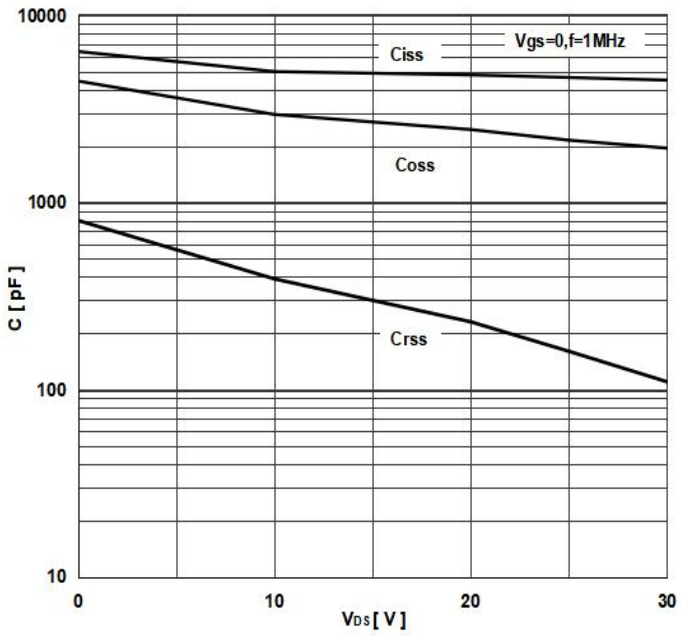
Typ.gate charge



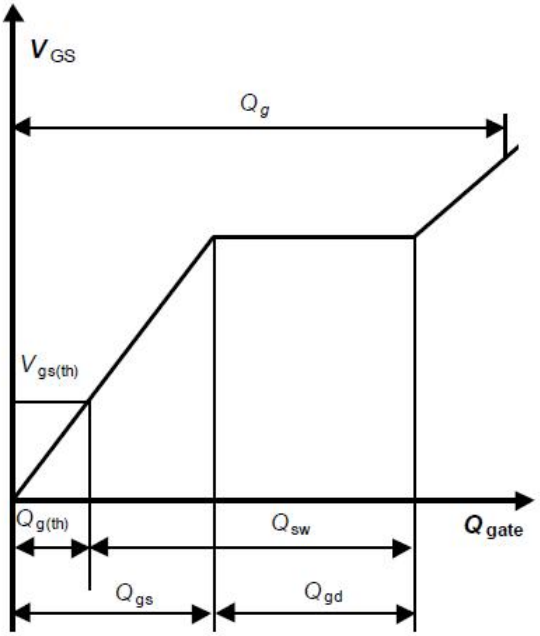
Avalanche energy



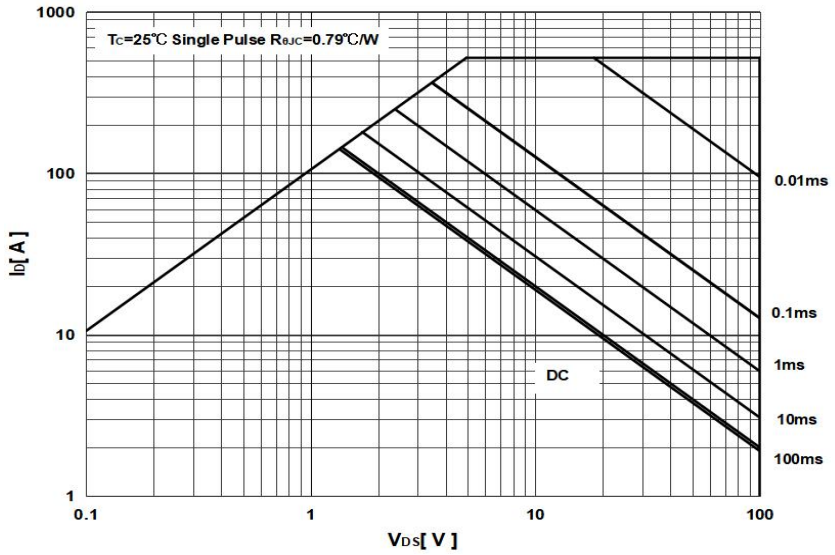
Typ.capacitance



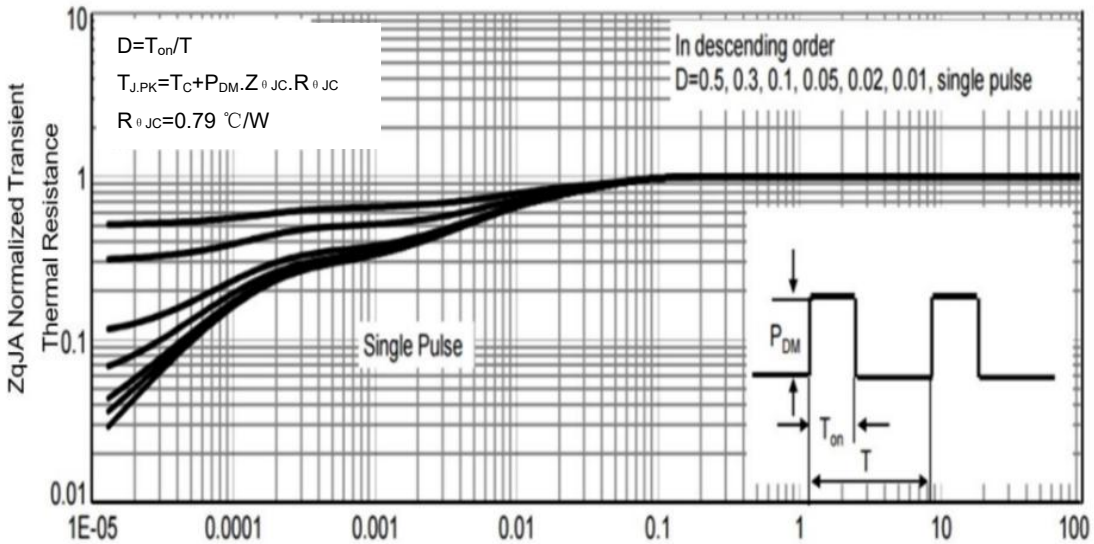
Gate charge waveforms



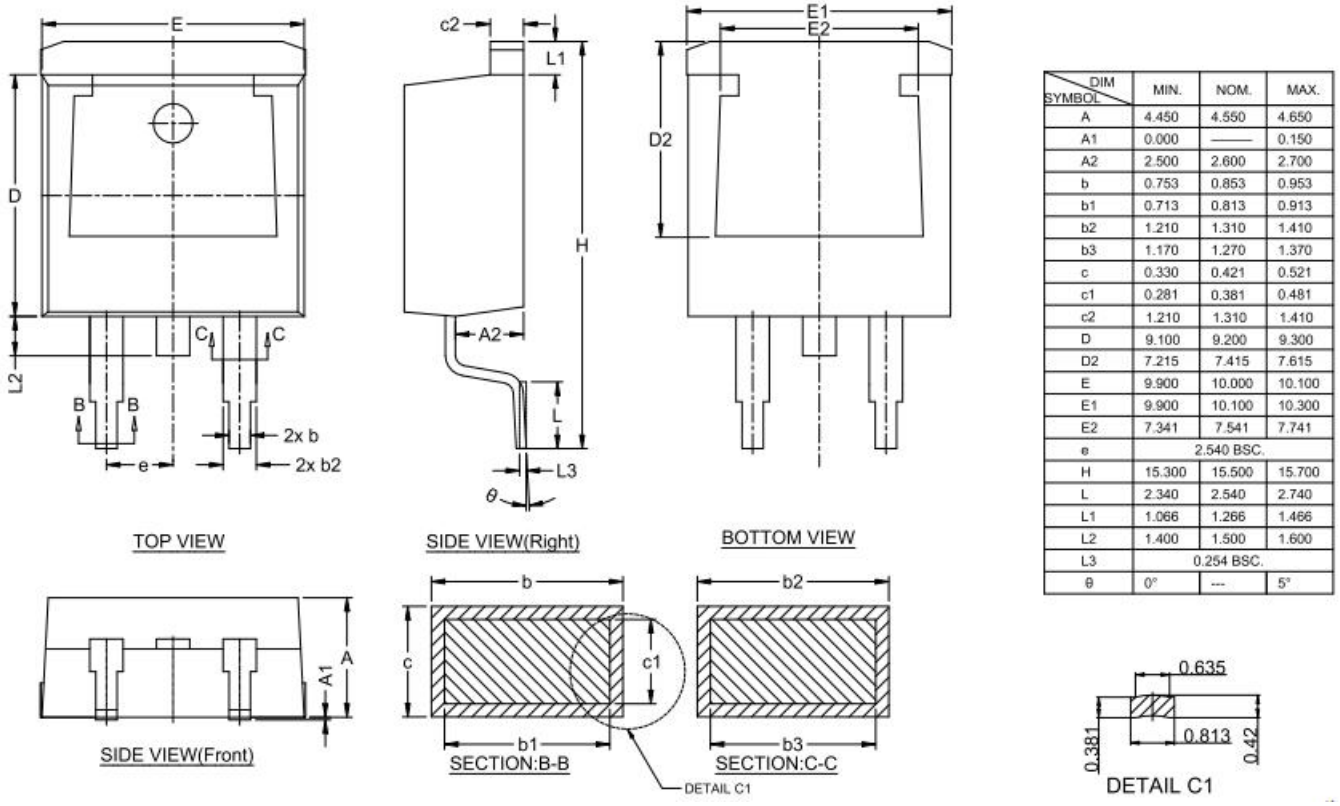
Safe operating area



Normalized Thermal Transient Impedance

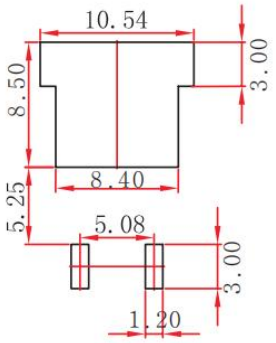


TO-263-2L Package Outline Dimensions



DIM / SYMBOL	MIN.	NOM.	MAX.
A	4.450	4.550	4.650
A1	0.000	———	0.150
A2	2.500	2.600	2.700
b	0.753	0.853	0.953
b1	0.713	0.813	0.913
b2	1.210	1.310	1.410
b3	1.170	1.270	1.370
c	0.330	0.421	0.521
c1	0.281	0.381	0.481
c2	1.210	1.310	1.410
D	9.100	9.200	9.300
D2	7.215	7.415	7.615
E	9.900	10.000	10.100
E1	9.900	10.100	10.300
E2	7.341	7.541	7.741
e		2.540 BSC.	
H	15.300	15.500	15.700
L	2.340	2.540	2.740
L1	1.066	1.266	1.466
L2	1.400	1.500	1.600
L3		0.254 BSC.	
θ	0°	---	5°

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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Date of change	Rev #	revise content
2024/01/20	A/0	/