

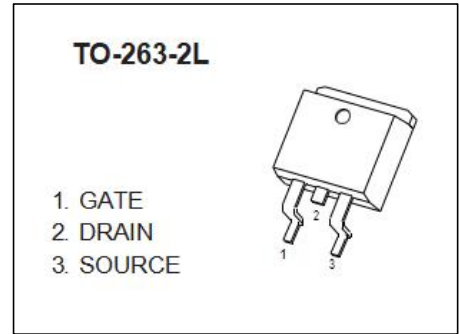


CHONGQING CLOUDCHILD TECHNOLOGY CO.,LTD

**TO-263-2L Plastic-Encapsulate MOSFETS**

**CCMA100N06S N-Channel Power MOSFET**

$V_{(BR)DSS}$	$R_{DS(on)}$ TYP	$I_D$
60 V	2.8mΩ@10V	100A
	5.5mΩ@4.5V	



**DESCRIPTION**

The CCMA100N06S 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 .

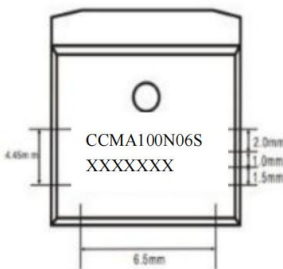
**FEATURES**

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

**APPLICATIONS**

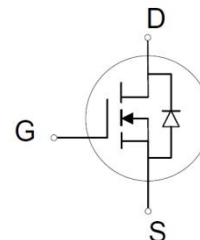
- 12V/24V Automotive systems
- Motors,lamps and solenoid control
- Transmission control
- Power switching application

**MARKING**



CCMA100N06S =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	$V_{DS}$	60	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current <sup>1</sup>	$I_D$	100	A
Pulsed Drain Current <sup>2</sup>	$I_{DM}$	400	A
Single Pulse Avalanche Energy <sup>23</sup>	EAS	225	mJ
Total Power Dissipation	$P_D$	125	W
Thermal Resistance from Junction to Case <sup>2</sup>	$R_{\theta JC}$	1.2	$^{\circ}\text{C}/\text{W}$
Device on PCB <sup>4</sup>	$R_{\theta JA}$	minimal footprint	62
		6cm <sup>2</sup> cooling area	40
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 package; with a  $R_{thjc} = 1.2^{\circ}\text{C}/\text{W}$  the chip is able to carry 180A at 25°C.
2. Specified by design. Not subject to production test.
3. EAS condition:  $T_j=25^{\circ}\text{C}$ ,  $V_{DD}=30\text{V}$ ,  $L=0.5\text{mH}$ ,  $R_G=25\Omega$ ,  $I_D=30\text{A}$ , Starting  $T_J = 25^{\circ}\text{C}$ .
4. Device on 40 mm x 40 mm x 1.5 mm epoxy PCB FR4 with 6 cm<sup>2</sup> (one layer, 70  $\mu\text{m}$  thick) copper area for drain connection. PCB is vertical in still air.

# MOSFET ELECTRICAL CHARACTERISTICS

TC=25°C unless otherwise specified

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
<b>Off characteristics</b>						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	60			V
Zero gate voltage drain current	$I_{DSS}$	$V_{DS} = 60V, V_{GS} = 0V$			1	$\mu A$
Gate-body leakage current	$I_{GSS}$	$V_{DS} = 0V, V_{GS} = \pm 20V$			$\pm 100$	nA
<b>On characteristics</b>						
Gate-threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	2.0	2.5	3.0	V
Static drain-source on-state resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 100A$		2.8	4.8	m $\Omega$
Forward transconductance	$g_{fs}$	$V_{DS} = 10V, I_D = 100A$		50		S
<b>Dynamic characteristics<sup>1</sup></b>						
Input capacitance	$C_{iss}$	$V_{DS} = 25V, V_{GS} = 0V,$ $f = 1MHz$		3800	4950	pF
Output capacitance	$C_{oss}$			1358	1770	
Reverse transfer capacitance	$C_{rss}$			76	98	
Gate resistance	$R_g$	$f = 1MHz$		2.4		$\Omega$
<b>Switching characteristics<sup>1</sup></b>						
Total gate charge	$Q_g$	$V_{GS} = 0-10V, V_{DD} = 30V,$ $I_D = 100A$		60	70	nC
Gate-source charge	$Q_{gs}$			20		
Gate-drain charge	$Q_{gd}$			12	15	
Turn-on delay time	$t_{d(on)}$	$V_{DD} = 30V, I_D = 100A,$ $V_{GS} = 10V, R_G = 5\Omega$		18		ns
Turn-on rise time	$t_r$			15		
Turn-off delay time	$t_{d(off)}$			35		
Turn-off fall time	$t_f$			10		
<b>Drain-Source Diode Characteristics</b>						
Drain-source diode forward voltage	$V_{SD}$	$V_{GS} = 0V, I_S = 100A$			1.2	V
Continuous drain-source diode forward Current <sup>12</sup>	$I_S$	-			100	A
Pulsed drain-source diode forward current <sup>1</sup>	$I_{SM}$	-			400	A
Reverse recovery time <sup>1</sup>	$T_{rr}$	$I_F = 100A,$ $dI/dt = 100A/\mu s, V_R = 30V$		55	88	ns
Reverse recovery charge <sup>1</sup>	$Q_{rr}$			73		nC

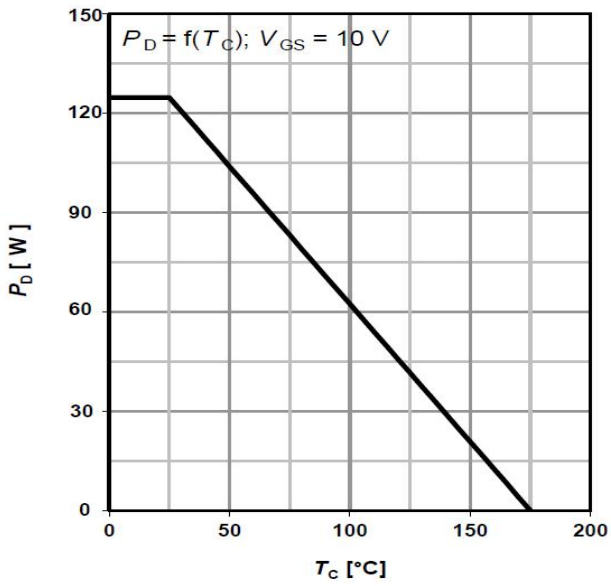
Note :

1. Specified by design. Not subject to production test.

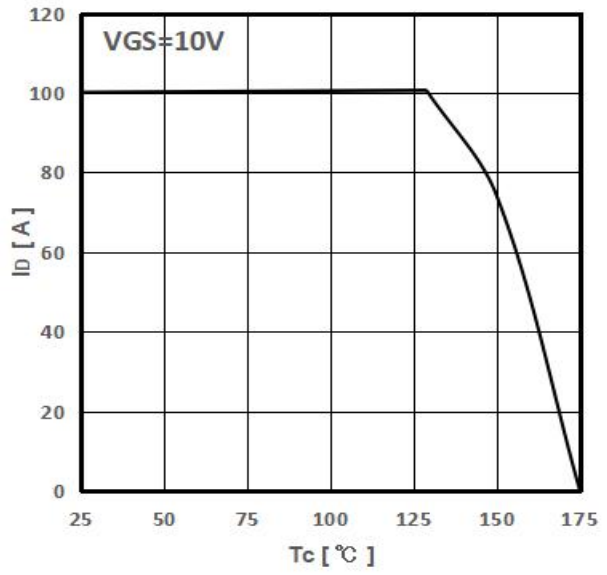
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# Typical Characteristics

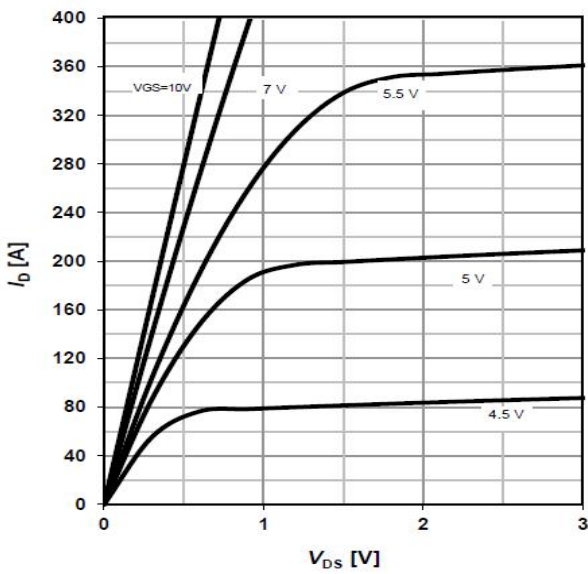
PD -- Tc



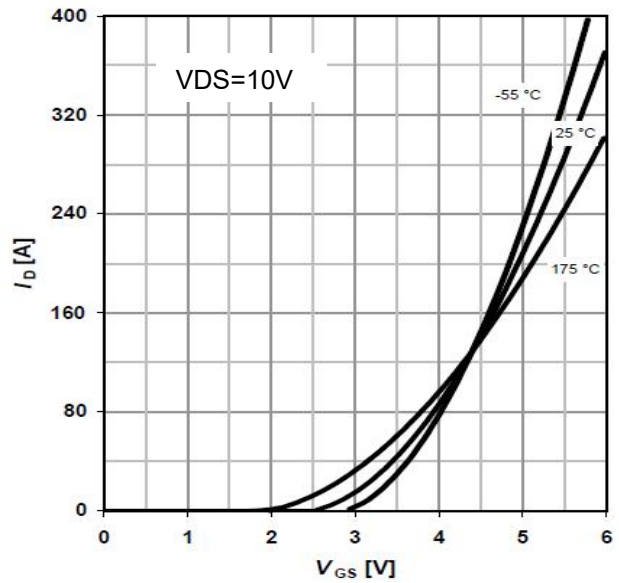
ID -- Tc



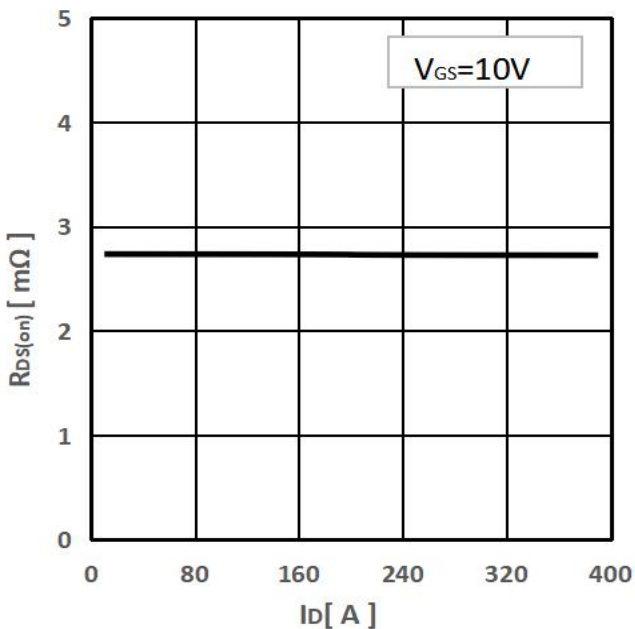
ID -- VDS



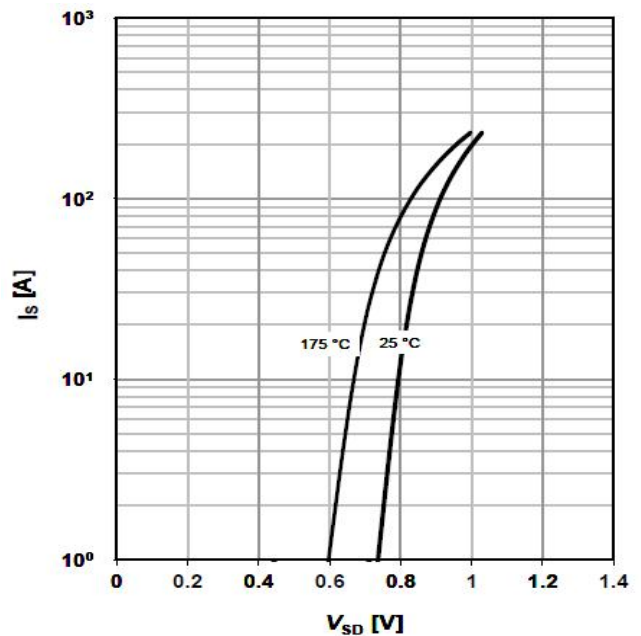
ID -- VGS



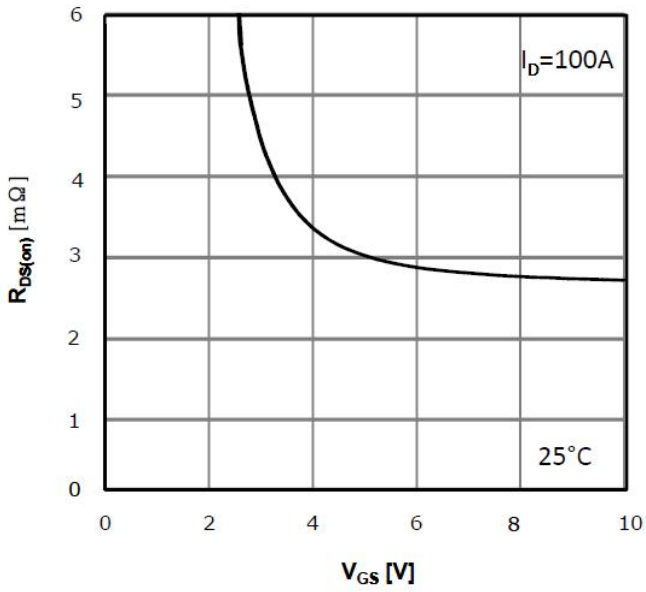
RDS(on) -- ID



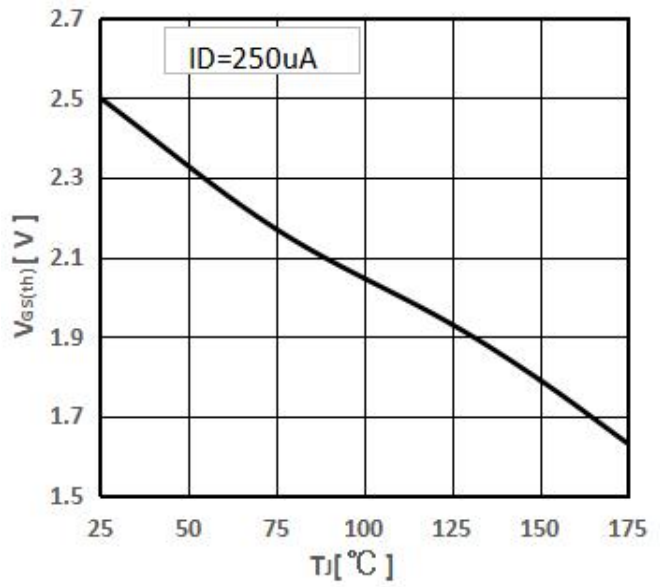
IS -- VSD



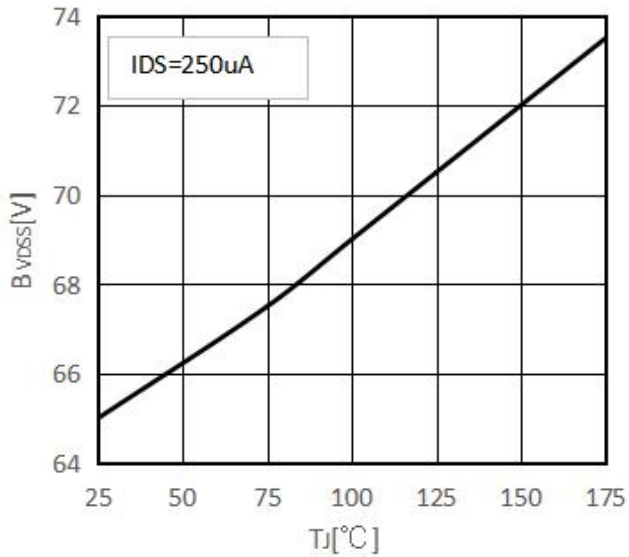
**RDS(on) -- VGS**



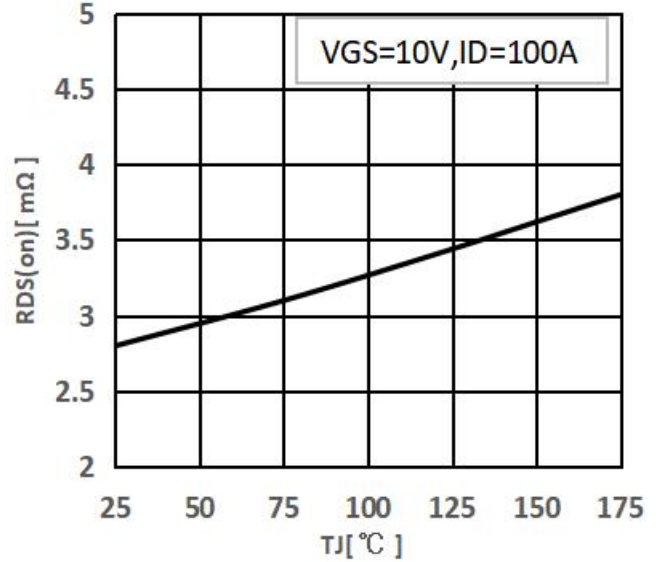
**Threshold Voltage**



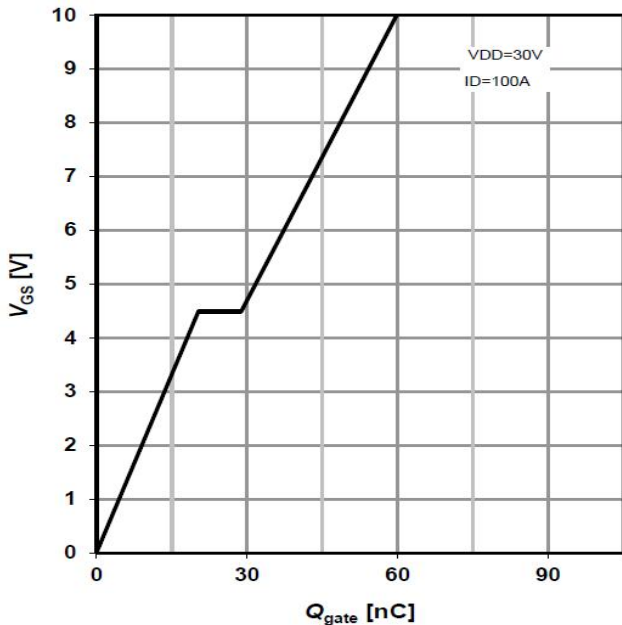
**Drain-source breakdown voltage**



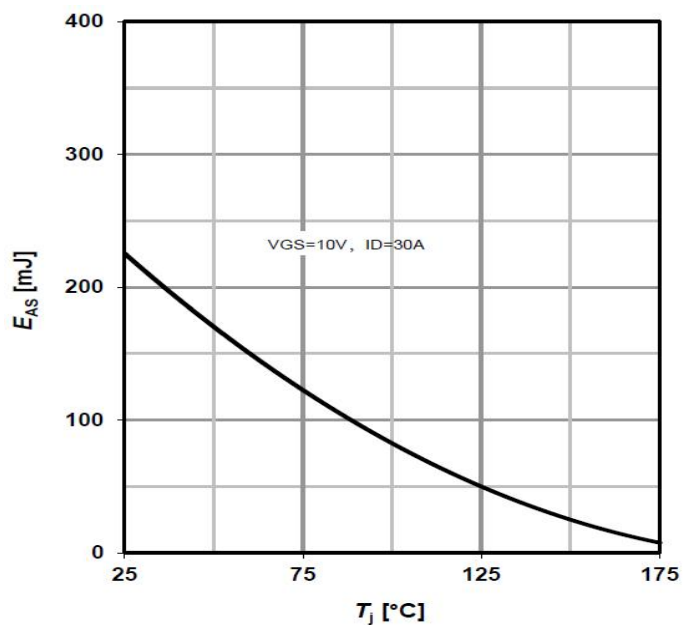
**RDS (on) -- TJ**



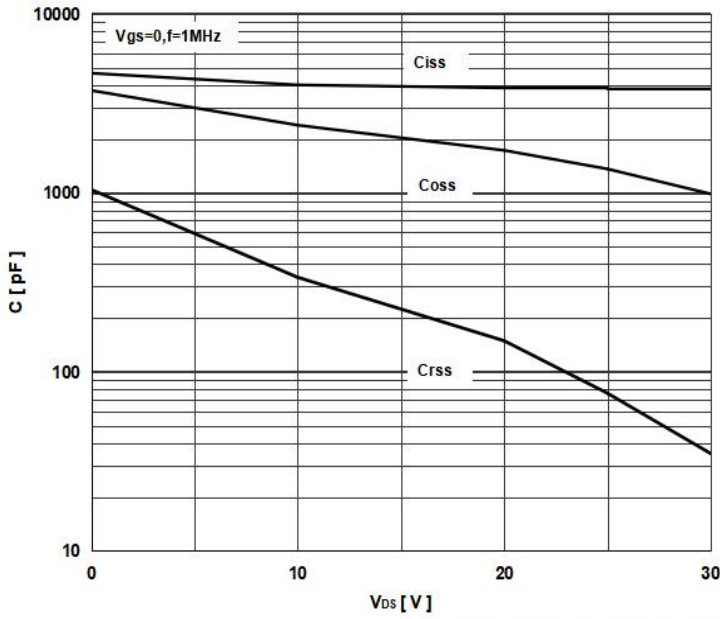
**Typ.gate charge**



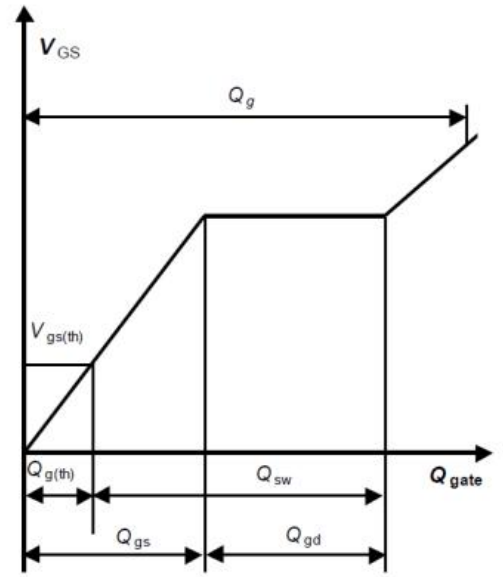
**Avalanche energy**



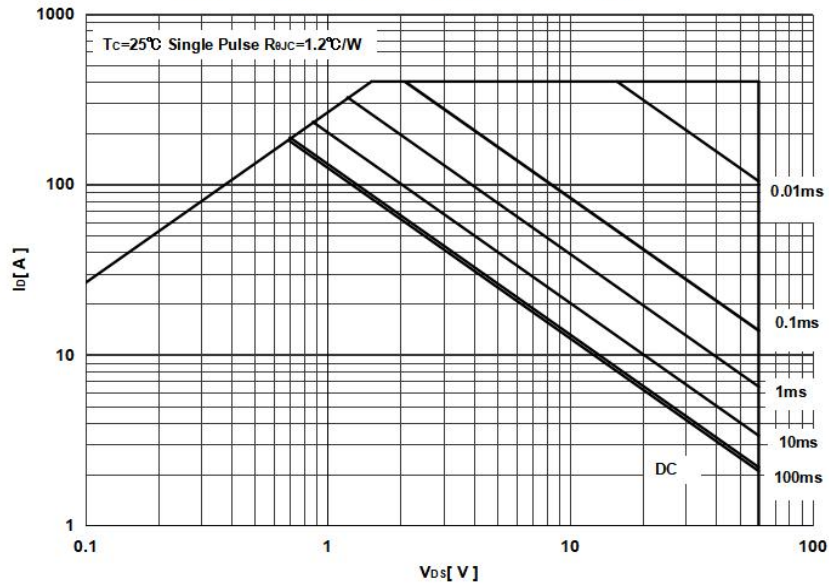
### Typ. capacitance



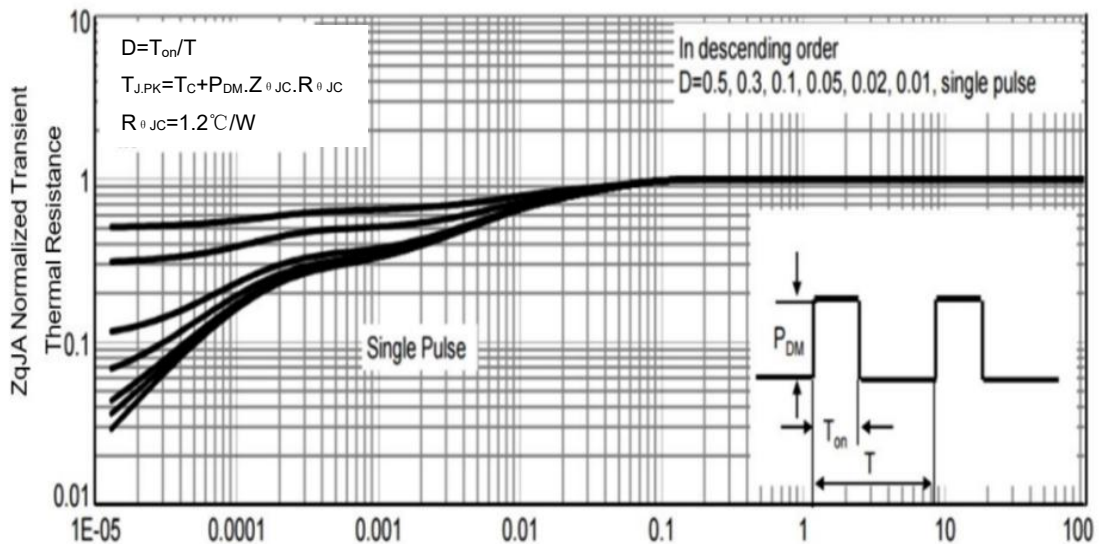
### Gate charge waveforms



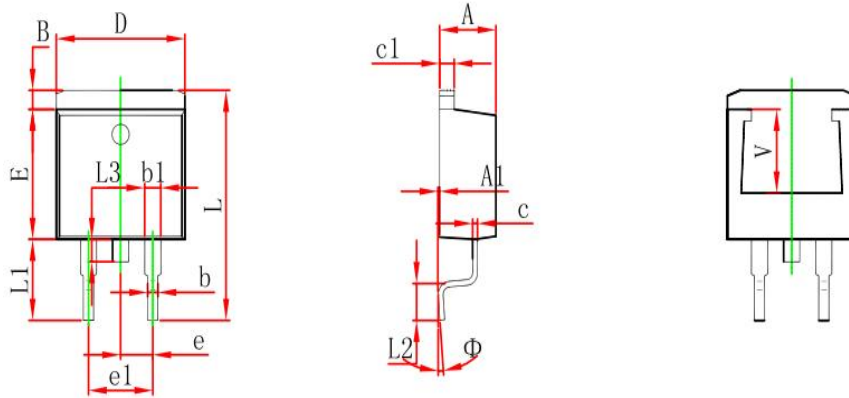
### Maximum Forward Biased Safe Operating Area



### Normalized Thermal Transient Impedance

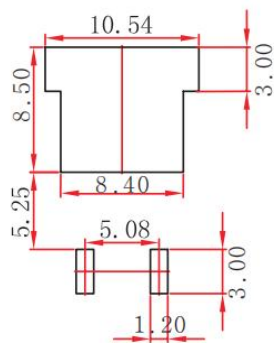


## TO-263-2L Package Outline Dimensions



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	4.950	5.450	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.

### NOTICE

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Date of change	Rev #	revise content
2023/11/16	A/0	/