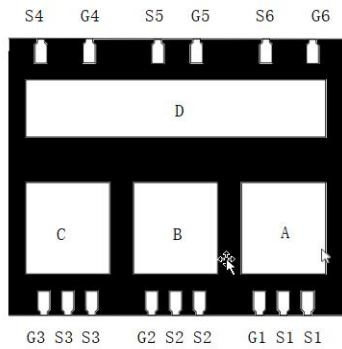




**CHONGQING CLOUDCHILD TECHNOLOGY CO.,LTD**  
**DFN14\*12 Plastic-Encapsulate MOSFETS**

**CCM30N4-6A**      Full bridge N Channel MOSFET

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	$I_D$
40 V	8.5mΩ@10V	30A
	10.2mΩ@4.5V	



**DESCRIPTION**

The CCM30N4-6A provides excellent  $R_{DS(ON)}$  with low gate charge. It can be used in a wide variety of applications.

**FEATURE**

- Split Gate Trench Technology
- Low  $R_{DS(ON)}$
- Low Gate Charge
- Low Gate Resistance
- AEC Q101 qualified

**APPLICATION**

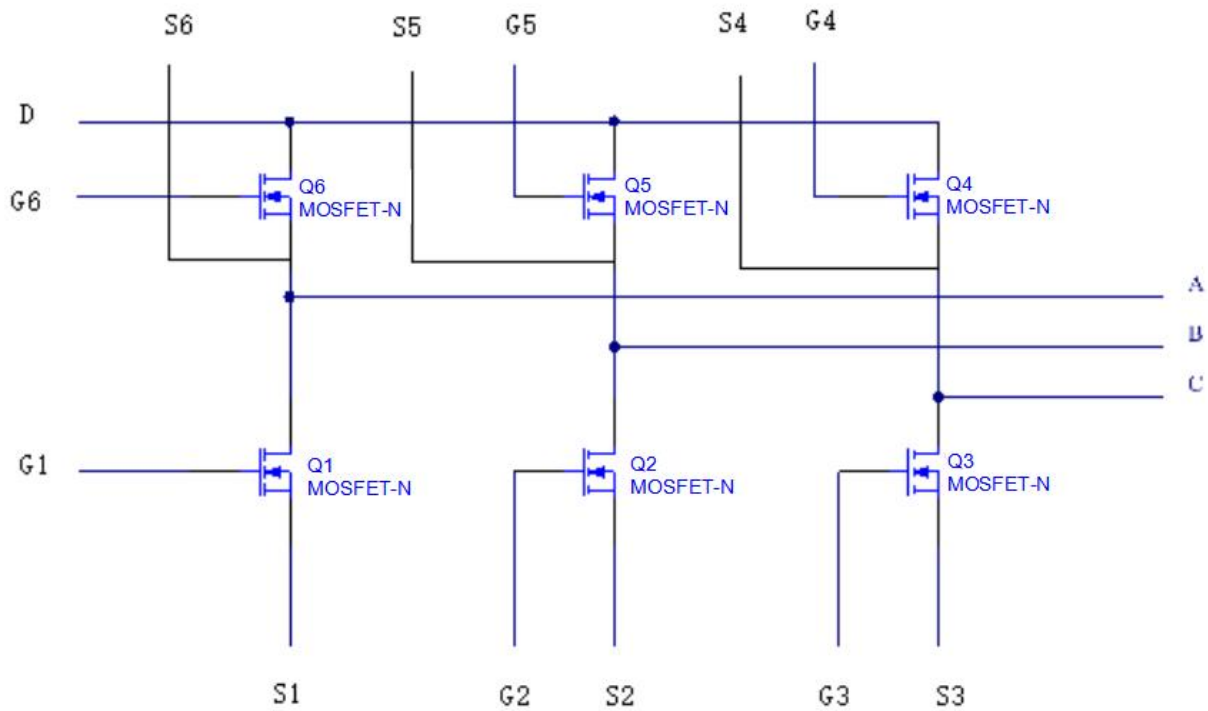
- motor control
- Full bridge module

**MARKING**



CCM30N4-6A =Part No.  
 XXXXXXXX = Code

## EQUIVALENT CIRCUIT



## Pin Definition

Number	Pin Definition	Remark	Number	Pin Definition	Remark
1	S1	Lower bridge u phase source	11	G4	Upper bridge w gate
2	S1	Lower bridge u phase source	12	S5	Upper Bridge v phase source collection
3	G1	Lower bridge u phase gate	13	G5	Upper bridge v gate
4	S2	Lower bridge v phase source	14	S6	Upper Bridge u phase source collection
5	S2	Lower bridge v phase source	15	G6	Upper bridge u gate
6	G2	Lower bridge v phase gate	PAD 1	D	DC Input
7	S3	Lower bridge w phase source	PAD 2	A	A phase output
8	S3	Lower bridge w phase source	PAD 3	B	B phase output
9	G3	Lower bridge w phase gate	PAD 4	C	C phase output
10	S4	Upper Bridge w phase source collection			

**ABSOLUTE MAXIMUM RATINGS (T<sub>a</sub>=25C unless otherwise noted)**

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V <sub>DS</sub>	40	V
Gate-Source Voltage	V <sub>GS</sub>	±20	V
Continuous Drain Current <sup>1</sup>	I <sub>D</sub>	30	A
Pulsed Drain Current <sup>2</sup>	I <sub>DM</sub>	120	A
Single Pulsed Avalanche Energy <sup>3</sup>	EAS	64	mJ
Total Power Dissipation	P <sub>D</sub>	50	W
Thermal Resistance from Junction to Case	R <sub>thJC</sub>	3	°C/W
Junction Temperature	T <sub>J</sub>	175	°C
Storage Temperature	T <sub>stg</sub>	-55~+175	°C
Soldering Temperature , for 10S(1.6mm from case)	-	260	°C

## Notes :

- 1.The maximum current rating is limited by package.And device mounted on a large heatsink.
- 2.Pulse Test : Pulse Width ≤ 10μs, duty cycle ≤ 1%.
- 3.EAS condition: VDD = 20V,VGS = 10V, L = 0.5mH, RG = 25Ω, Ias=16A, Starting T<sub>J</sub> = 25°C.

# MOSFET ELECTRICAL CHARACTERISTICS

TC=25°C unless otherwise specified

Parameter	Symbol	Test Condition	Min	Type	Max	Unit
<b>Off Characteristics</b>						
Drain - Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	40			V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 40V, V_{GS} = 0V$			1	$\mu A$
Gate - Body Leakage Current	$I_{GSS}$	$V_{GS} = \pm 20V, V_{DS} = 0V$			$\pm 100$	nA
<b>On Characteristics<sup>3</sup></b>						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	1.0	1.75	3.0	V
Drain-source On-resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 10A$		8.5	11.5	m $\Omega$
		$V_{GS} = 4.5V, I_D = 10A$		10.2	15.5	
Forward Transconductance	$g_{FS}$	$V_{DS} = 10V, I_D = 10A$		160		S
<b>Dynamic Characteristics</b>						
Input Capacitance	$C_{iss}$	$V_{DS} = 25V, V_{GS} = 0V, f = 1MHz$		2940		pF
Output Capacitance	$C_{oss}$			181		
Reverse Transfer Capacitance	$C_{rss}$			148		
Gate Resistance	$R_g$	$V_{DS} = 0V, V_{GS} = 0V, f = 1MHz$		3.3		$\Omega$
<b>Switching Characteristics</b>						
Total Gate Charge	$Q_g$	$V_{DD} = 20V, V_{GS} = 10V, I_D = 20A$		30		nC
Gate-source Charge	$Q_{gs}$			8		
Gate-drain Charge	$Q_{gd}$			15		
Turn-on Delay Time	$t_{d(on)}$	$V_{DD} = 20V, V_{GS} = 10V, R_L = 1\Omega, R_G = 3\Omega$		20		ns
Turn-on Rise Time	$t_r$			5		
Turn-off Delay Time	$t_{d(off)}$			70		
Turn-off Fall Time	$t_f$			5		
<b>Source - Drain Diode Characteristics</b>						
Diode Forward Voltage <sup>3</sup>	$V_{SD}$	$V_{GS} = 0V, I_S = 10A$			1.2	V
Continuous drain-source diode forward Current <sup>1</sup>	$I_S$	-			30	A
Pulsed drain-source diode forward current <sup>2</sup>	$I_{SM}$	-			120	A
Reverse recovery time	$T_{rr}$	$I_F = 10A, di/dt = 100A/\mu s$		16		ns
Reverse recovery charge	$Q_{rr}$				18	

Notes :

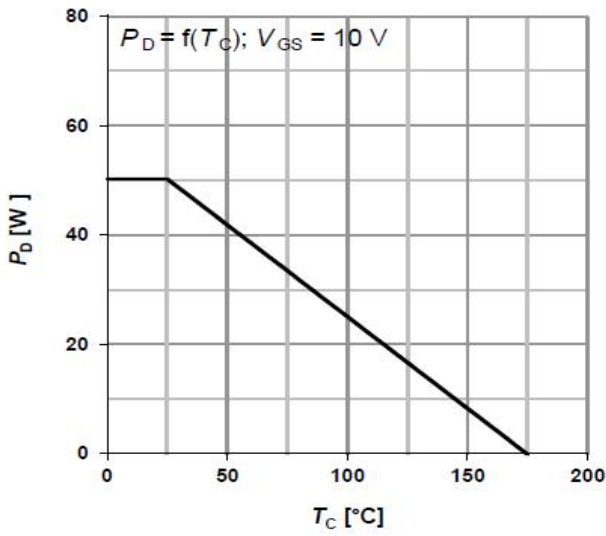
1.  $T_C = 25^\circ C$  Limited only by maximum temperature allowed.

2.  $P_W \leq 10\mu s$ , Duty cycle  $\leq 1\%$ .

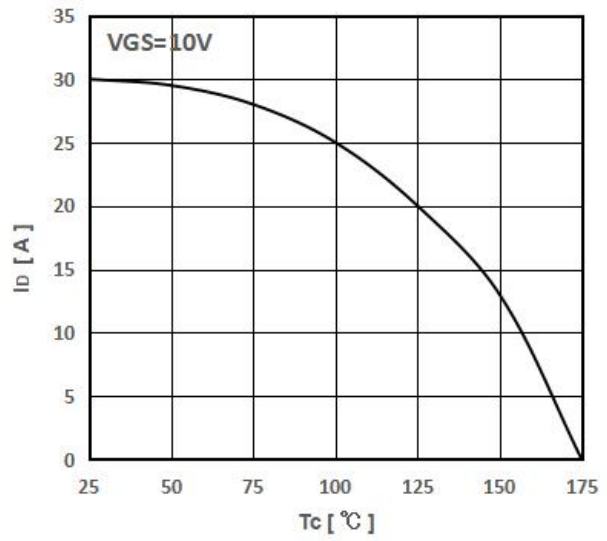
3. Pulse Test : Pulse Width  $\leq 300\mu s$ , duty cycle  $\leq 2\%$ .

# Typical Characteristics

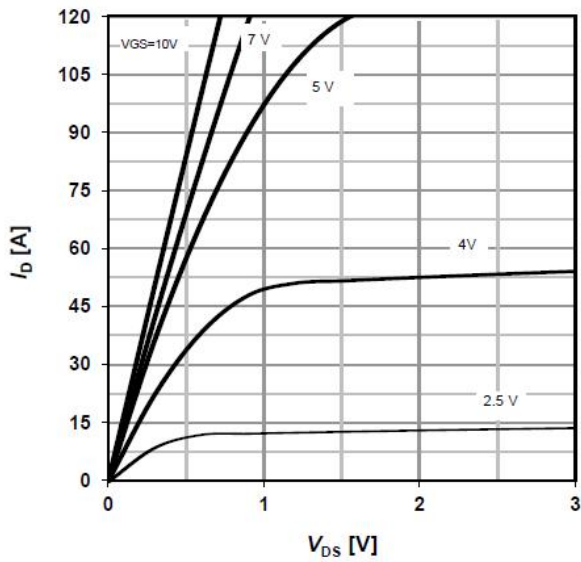
**PD-Tc**



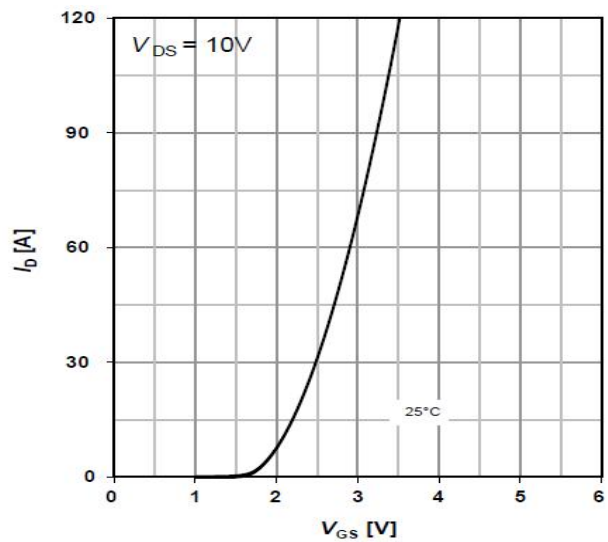
**ID -- Tc**



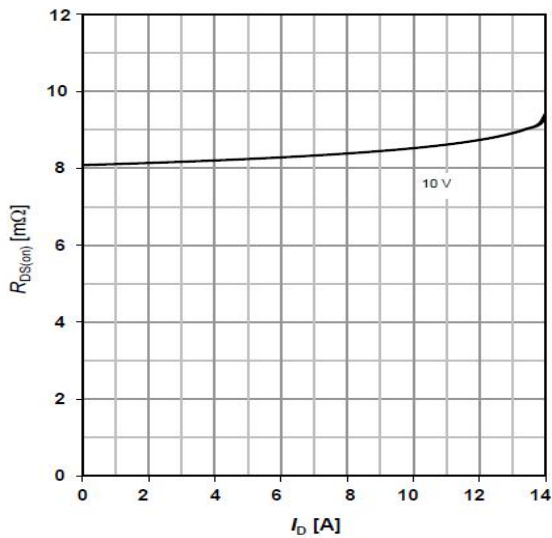
**ID -- VDS**



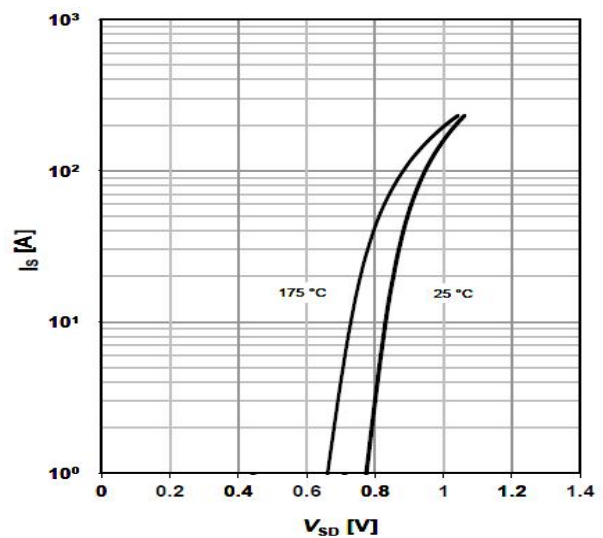
**ID -- VGS**



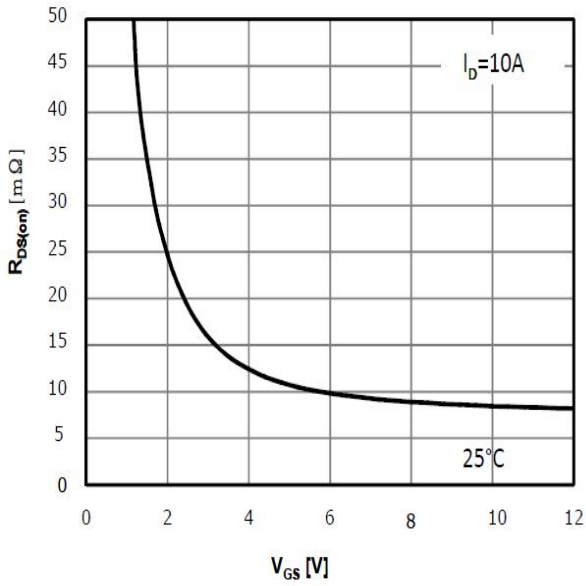
**RDS(on) - ID**



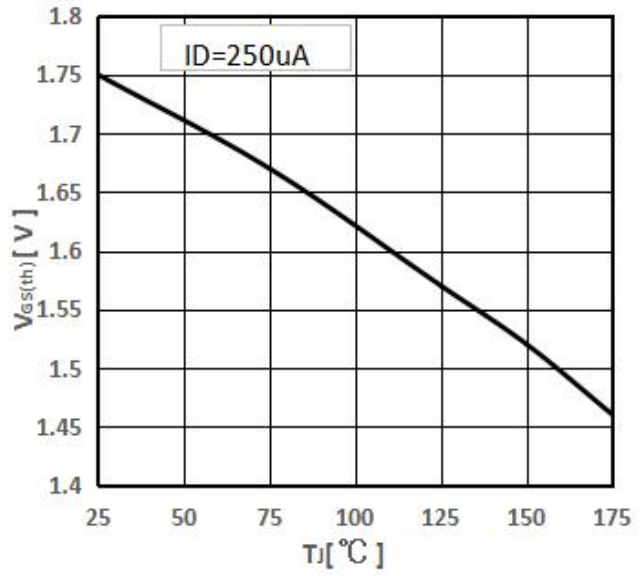
**IS - VSD**



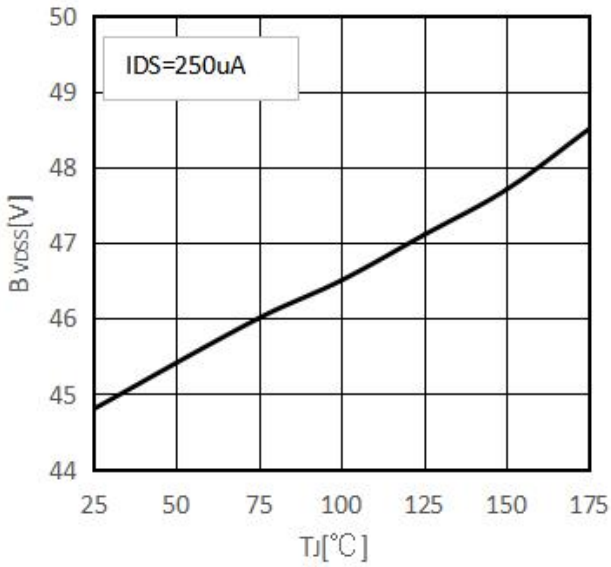
**RDS(on) -- VGS**



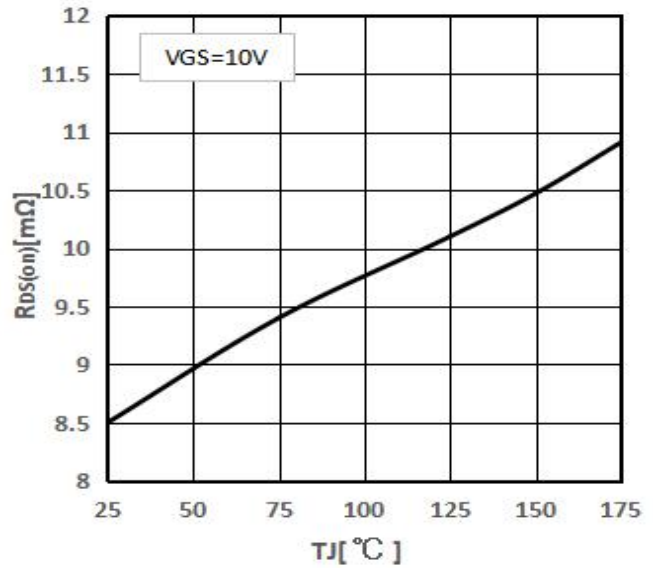
**Threshold Voltage**



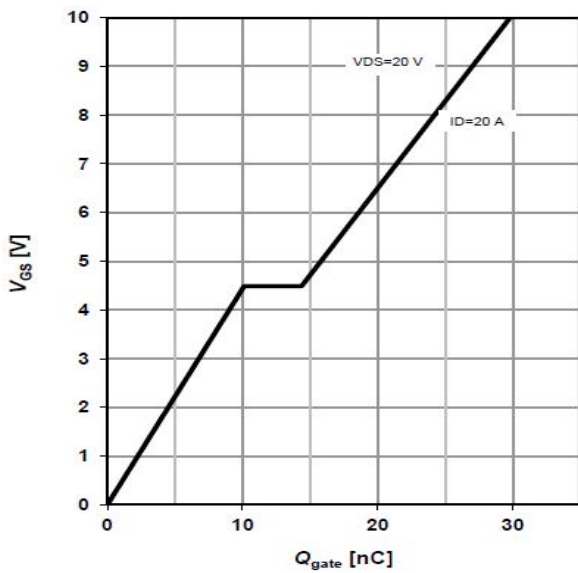
**Drain-source breakdown voltage**



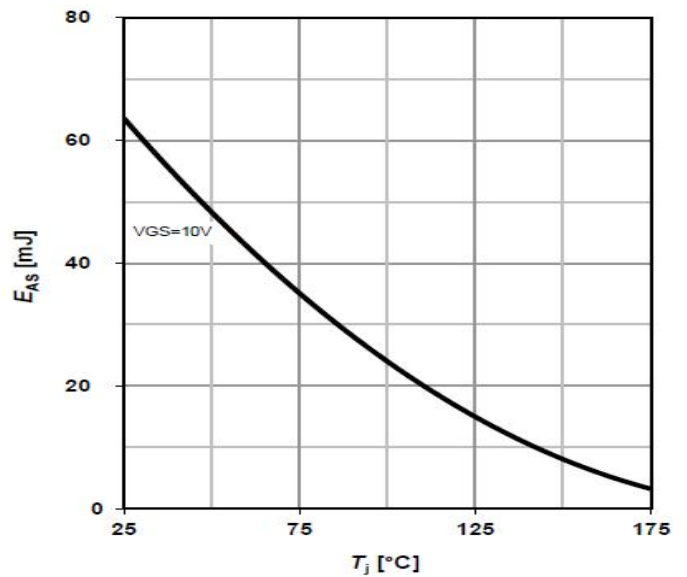
**RDS(on) -- TJ**



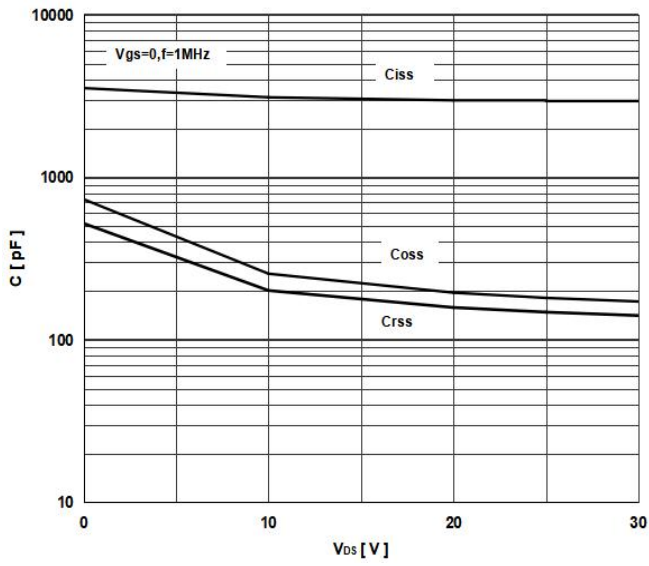
**Typ.gate charge**



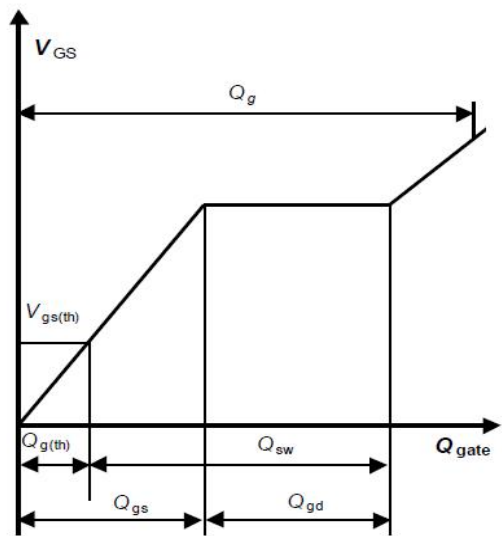
**Avalanche energy**



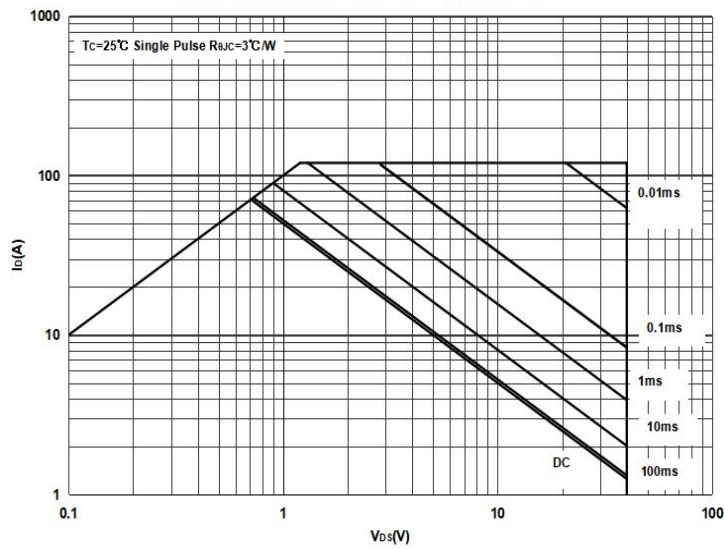
### Typ. capacitances



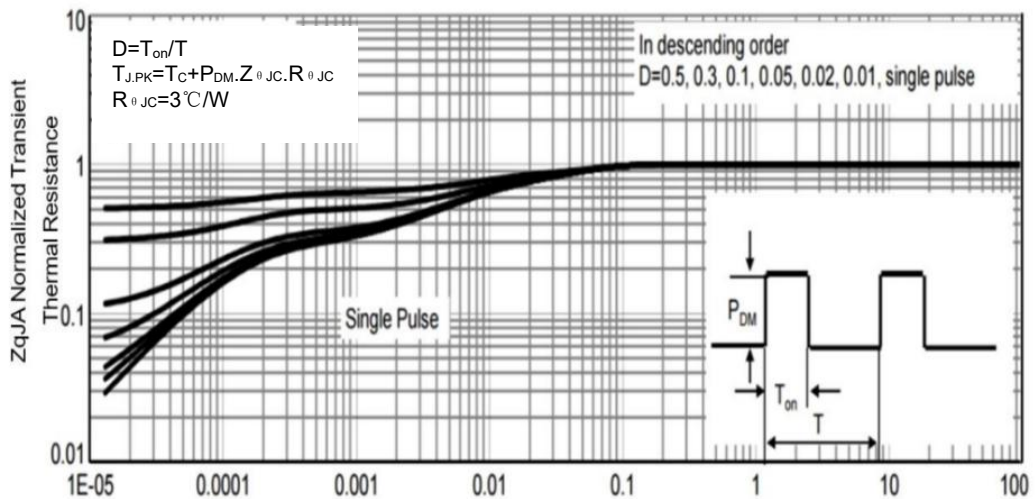
### Gate charge waveforms



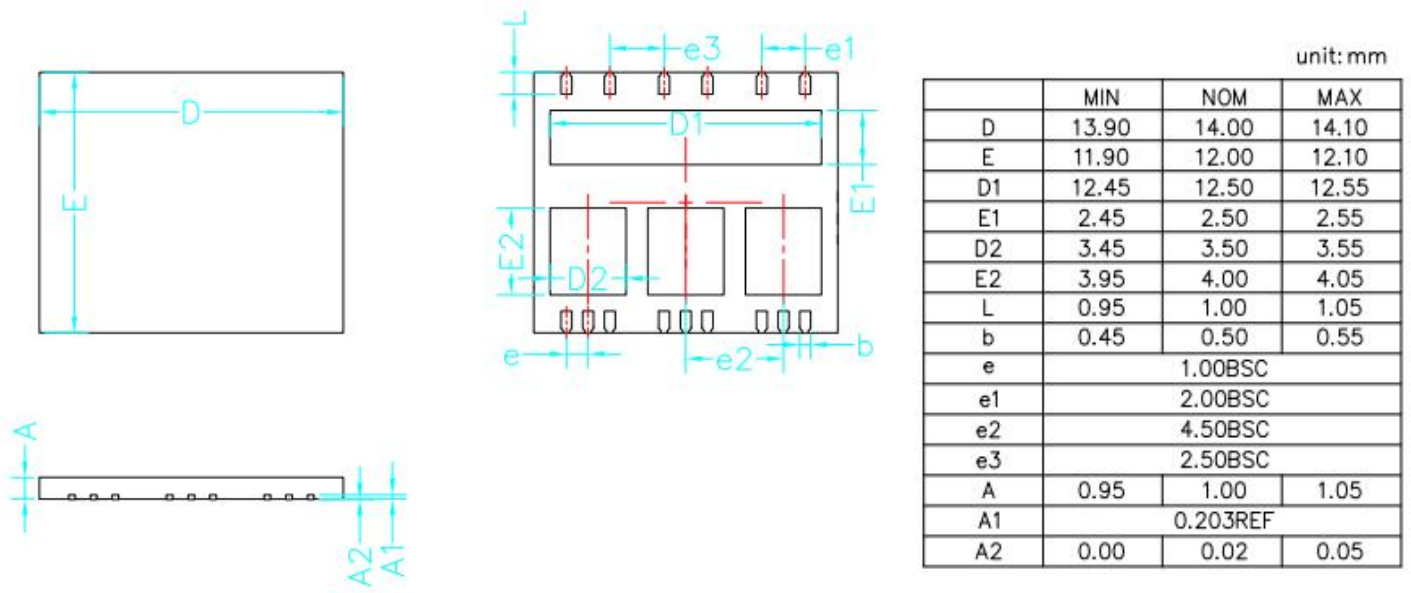
### Maximum Forward Biased Safe Operating Area



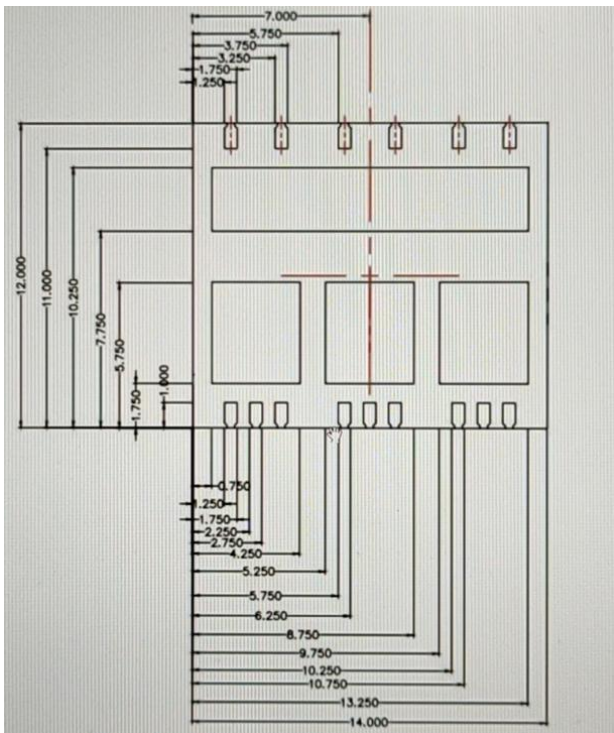
### Normalized Thermal Transient Impedance



## DFN14\*12 Package Outline Dimensions



## DFN14\*12 Suggested Pad Layout



### Note:

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

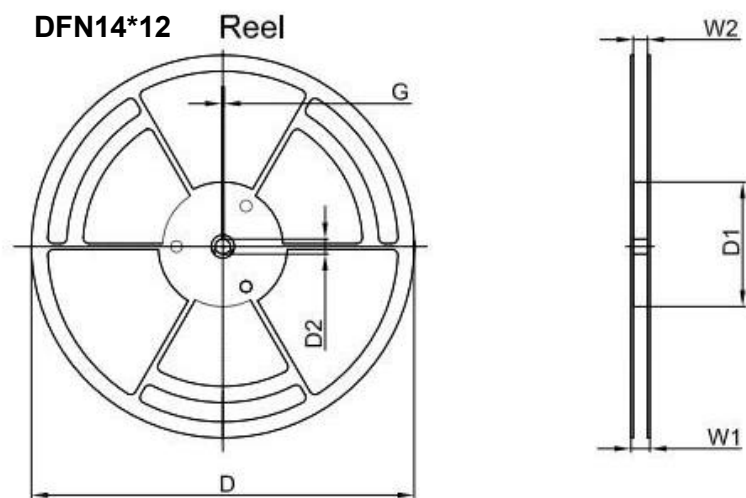
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## DFN14\*12 Tape and Reel



Dimensions are in millimeter						
Reel Option	D	D1	D2	G	W1	W2
13"Dia	Ø330.00	100.00	13.00	1.90	28.40	24.00

REEL	Reel Size	Box	Box Size(mm)	Carton	Carton Size(mm)
2,000 pcs	13 inch	4,000 pcs	340×336×29	20,000 pcs	353×346×365

Date of change	Rev #	revise content
2022/11/21	A/0	/