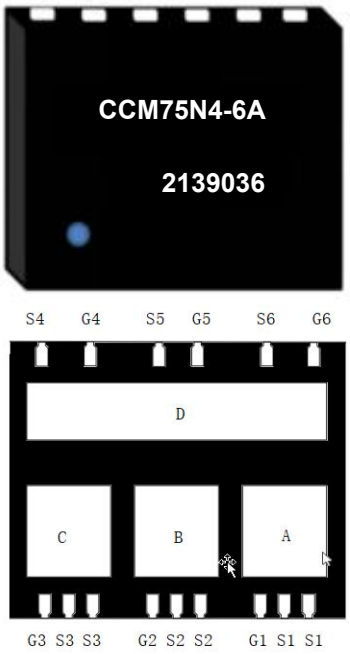
CHONGQING CLOUDCHILD TECHNOLOGY CO.,LTD

DFN14*12 Plastic-Encapsulate MOSFETS

CCM75N4-6A Full bridge N Channel MOSFET

$V_{(BR)DSS}$	$R_{DS(on)}$TYP	I_D
40 V	3.9mΩ@10V	75A
	5.0mΩ@4.5V	



DESCRIPTION

The CCM75N4-6A 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 RDS(ON)
- Low Gate Charge
- Low Gate Resistance
- AEC Q101 qualified

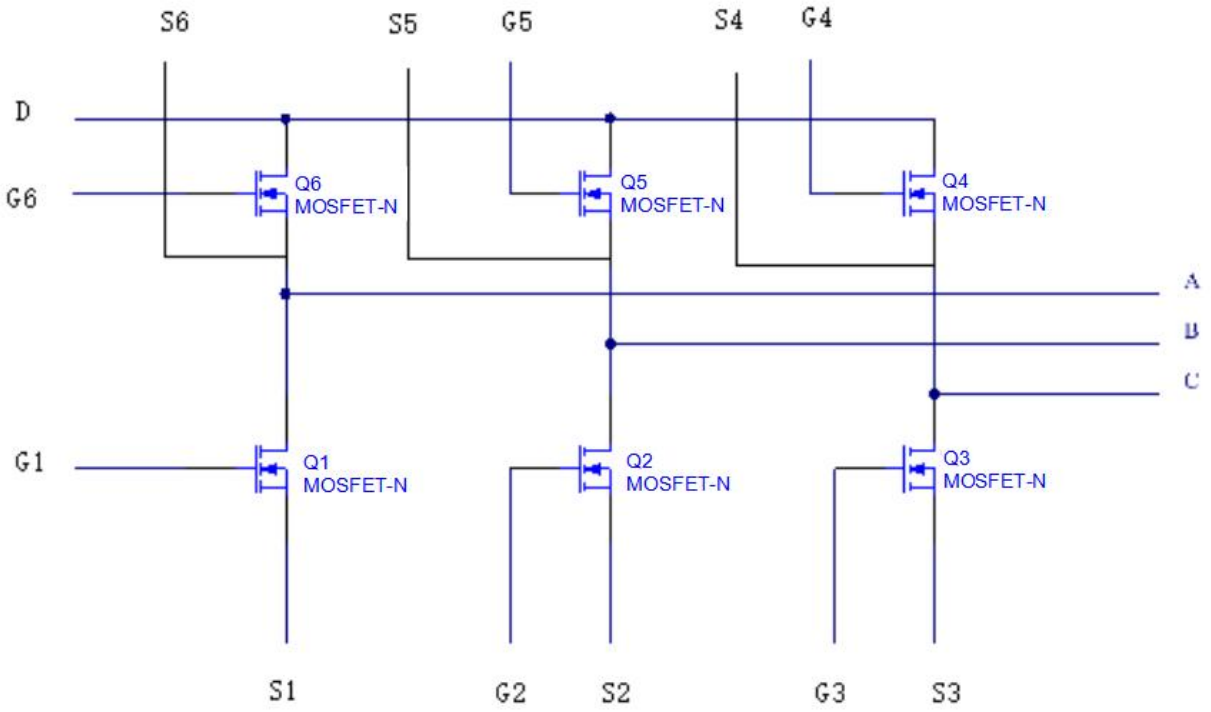
APPLICATION

- motor control
- Full bridge module

MARKING

CCM75N4-6A =Part No.
XXXXXXX = 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_a=25℃ 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	75	A
Pulsed Drain Current [2]	I_{DM}	300	A
Single Pulsed Avalanche Energy [3]	EAS	240	mJ
Total Power Dissipation	P_D	83	W
Thermal Resistance from Junction to Case[1]	R_{thJC}	1.8	℃/W
Junction Temperature	T_J	175	℃
Storage Temperature	Tstg	-55~+175	℃
Soldering Temperature , for 10S(1.6mm from case)	-	260	℃

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=31A， Starting TJ = 25°℃.

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} = 0V, I_D = 250μA	40			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 40V, V_{GS} = 0V			1	μA
Gate - Body Leakage Current	I_{GSS}	V_{GS} = ±20V, V_{DS} = 0V			±100	nA
On Characteristics[3]						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	1.0	1.7	3.0	V
Drain-source On-resistance	$R_{DS(on)}$	V_{GS} = 10V, I_D = 10A		3.9	6.2	mΩ
		V_{GS} = 4.5V, I_D = 10A		5.0	7.2	
Forward Transconductance	g_{FS}	V_{DS} = 10V, I_D = 10A		70		S
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS} = 25V, V_{GS} = 0V, f = 1MHz		6800		pF
Output Capacitance	C_{oss}			408		
Reverse Transfer Capacitance	C_{rss}			331		
Gate Resistance	R_g	V_{DS} = 0V, V_{GS} = 0V, f = 1MHz		1.5		Ω
Switching Characteristics						
Total Gate Charge	Q_g	V_{DD} = 20V, V_{GS} = 10V, I_D = 20A		31		nC
Gate-source Charge	Q_{gs}			6		
Gate-drain Charge	Q_{gd}			3.8		
Turn-on Delay Time	$t_{d(on)}$	V_{DD} = 20V, V_{GS} = 10V, R_L = 1Ω , R_G = 3Ω		7		ns
Turn-on Rise Time	t_r			2.8		
Turn-off Delay Ttime	$t_{d(off)}$			24		
Turn-off Fall Time	t_f			3.9		
Source - Drain Diode Characteristics						
Diode Forward Voltage[3]	V_{SD}	V_{GS} = 0V, I_S = 10A			1.2	V
Continuous drain-source diode forward Current[1]	Is	–			75	A
Pulsed drain-source diode forward current[2]	I_{SM}	–			300	A
Reverse recovery time	Trr	I_F=10A，dI/dt=100A/us		26		ns
Reverse recovery charge	Qrr			28		nC

Notes :

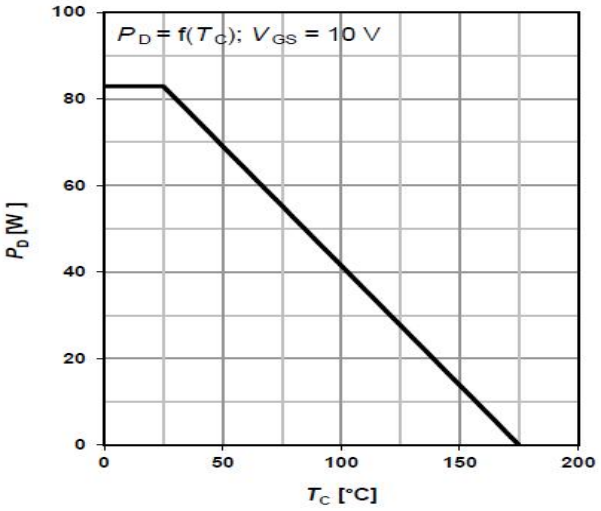
1.T_C=25℃ Limited only by maximum temperature allowed.

2.P_W≤10μs, Duty cycle≤1%.

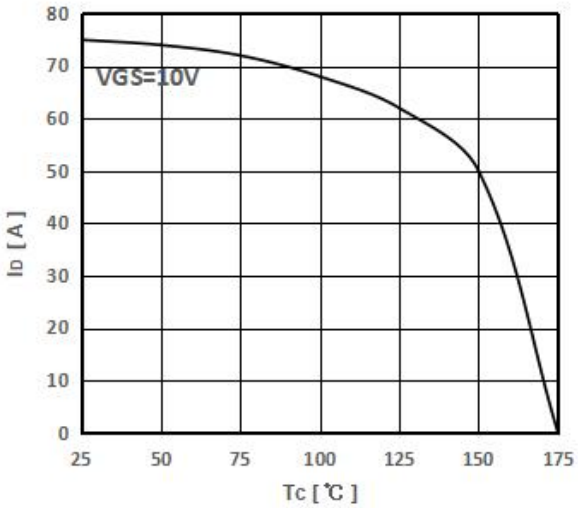
3.Pulse Test : Pulse Width ≤ 300μs, duty cycle ≤ 2%.

Typical Characteristics

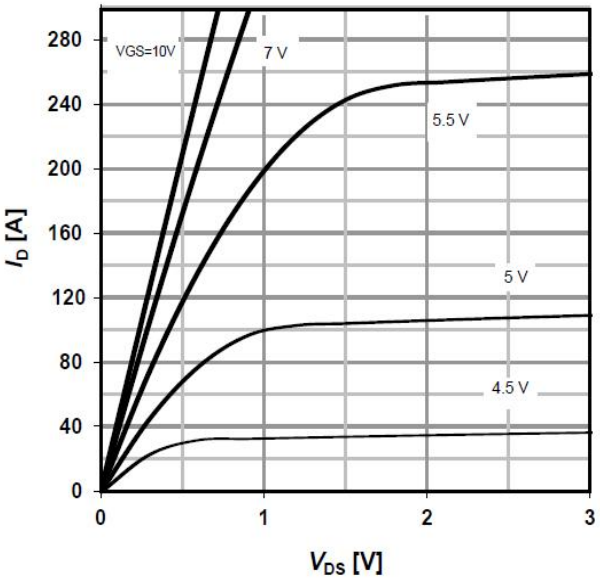
PD – Tc



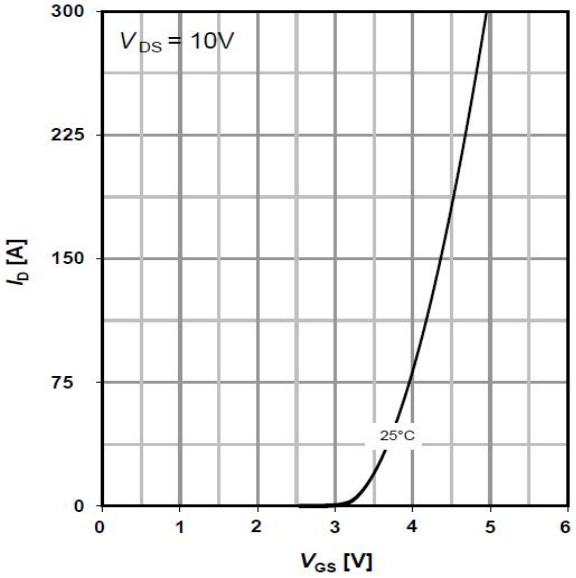
ID — Tc



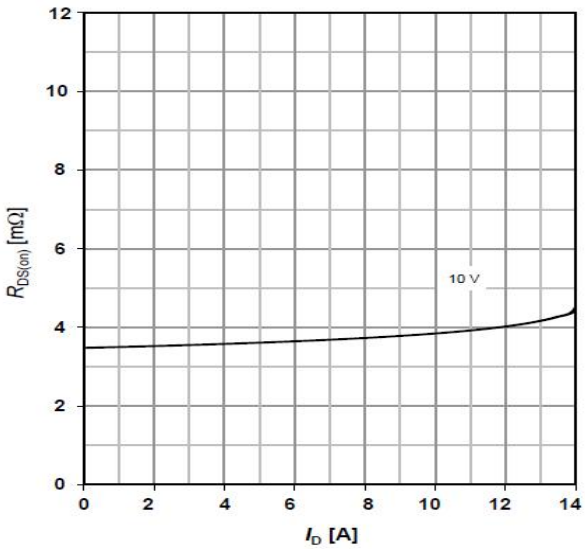
ID — VDS



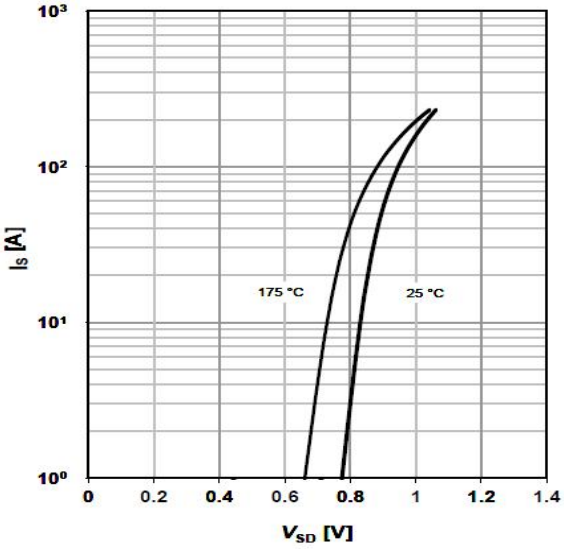
ID — VGS



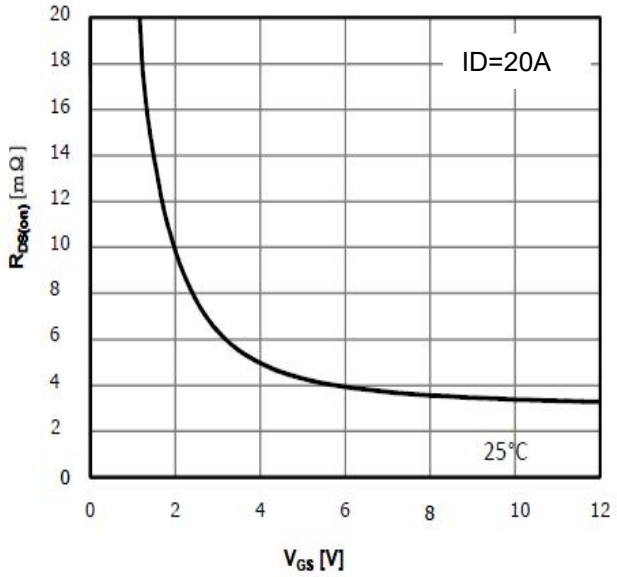
RDS(on) – ID



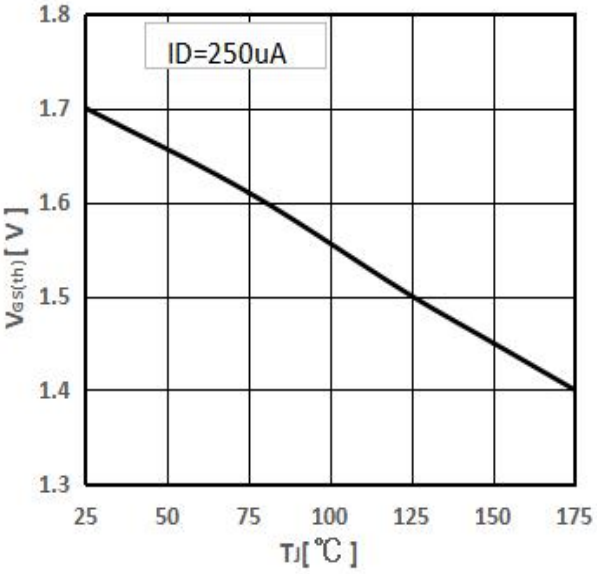
Is – VSD



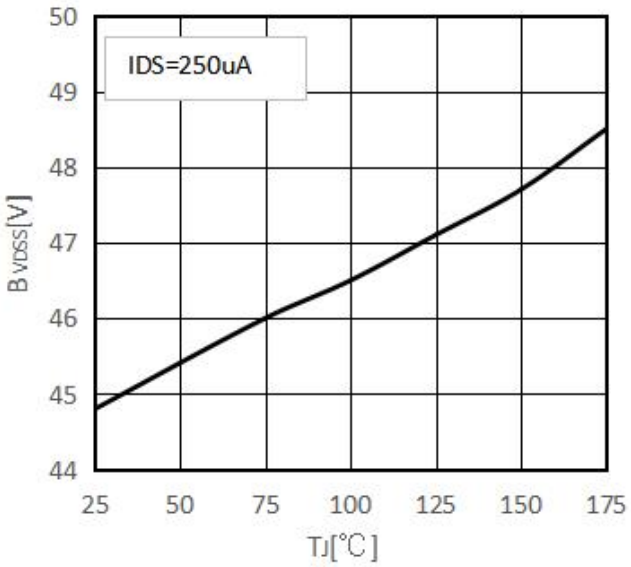
$R_{DS(on)}$ -- V_{GS}



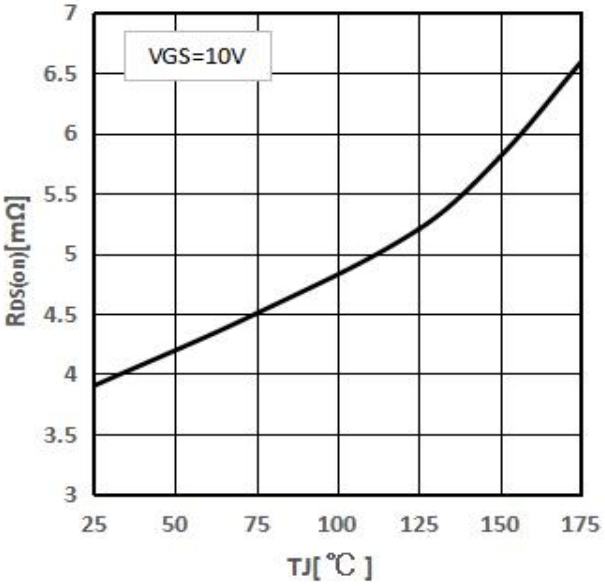
Threshold Voltage



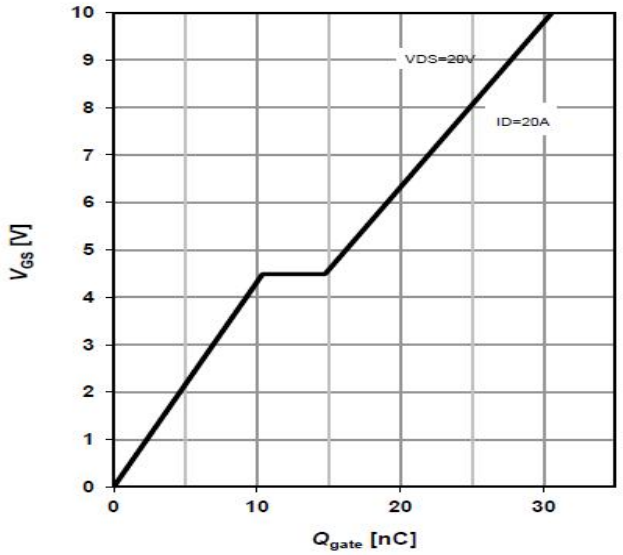
Drain-source breakdown voltage



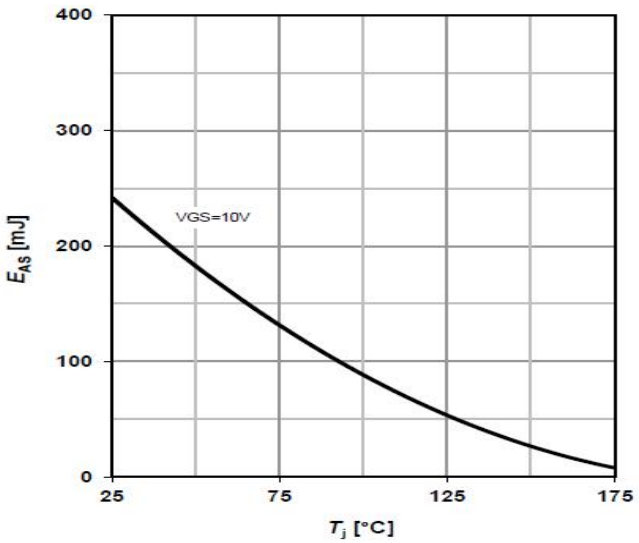
$R_{DS(on)}$ -- TJ



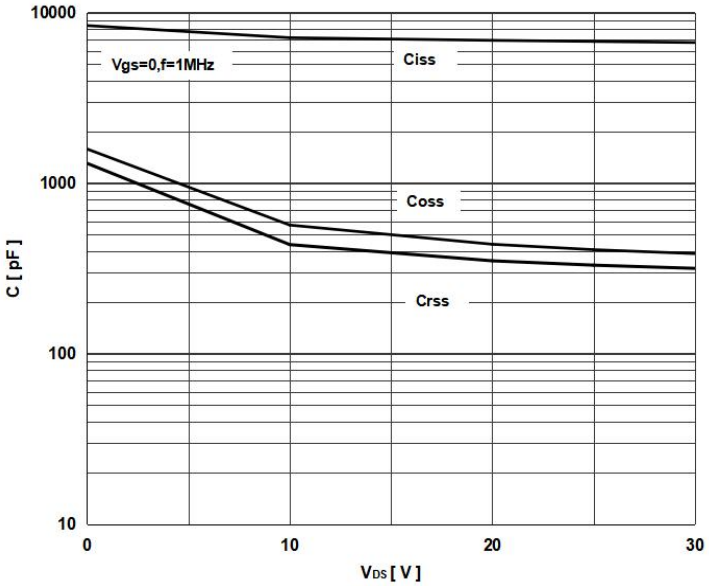
Typ.gate charge



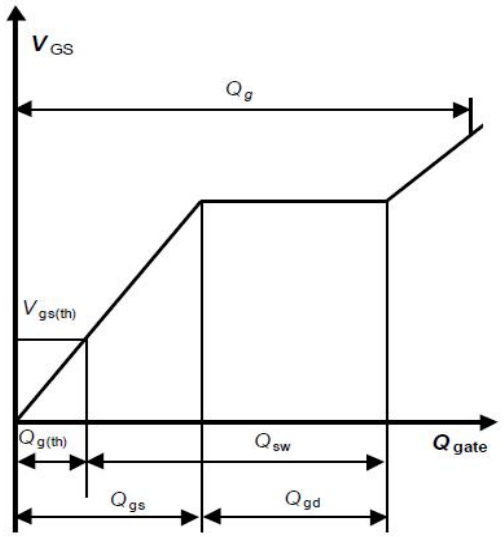
Avalanche energy



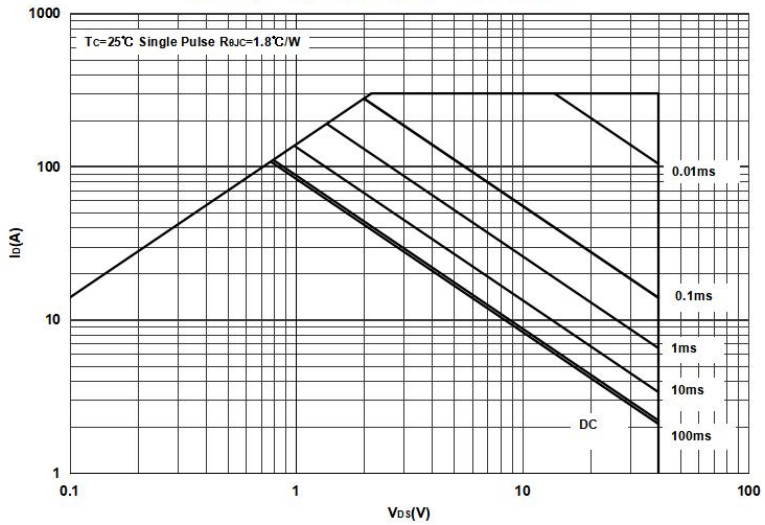
Typ.capacitances



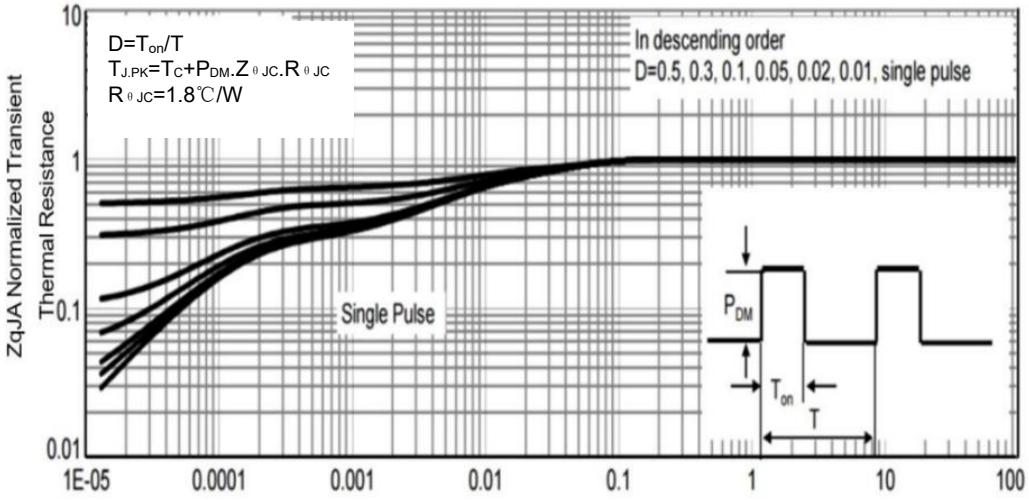
Gate charge waveforms



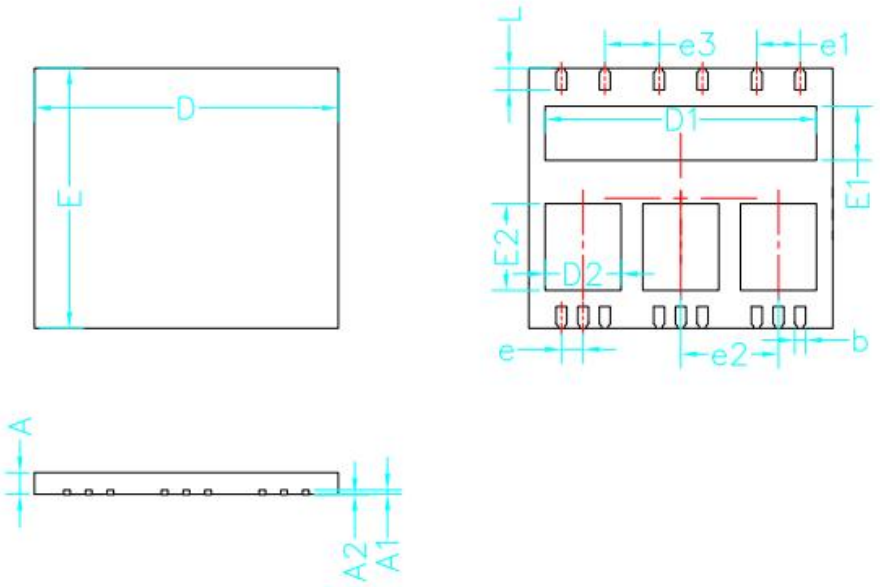
Maximum Forward Biased Safe Operating Area



Normalized Thermal Transient Impedance



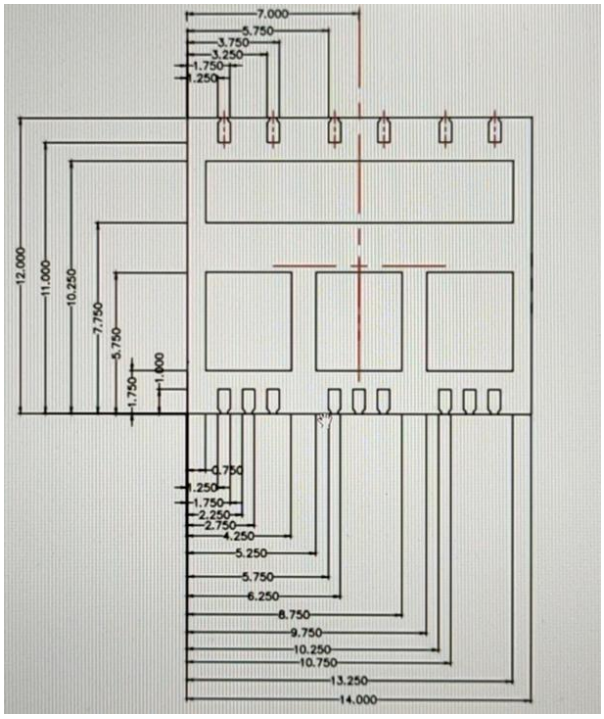
DFN14*12 Package Outline Dimensions



unit: mm

	MIN	NOM	MAX
D	13.90	14.00	14.10
E	11.90	12.00	12.10
D1	12.45	12.50	12.55
E1	2.45	2.50	2.55
D2	3.45	3.50	3.55
E2	3.95	4.00	4.05
L	0.95	1.00	1.05
b	0.45	0.50	0.55
e		1.00BSC	
e1		2.00BSC	
e2		4.50BSC	
e3		2.50BSC	
A	0.95	1.00	1.05
A1		0.203REF	
A2	0.00	0.02	0.05

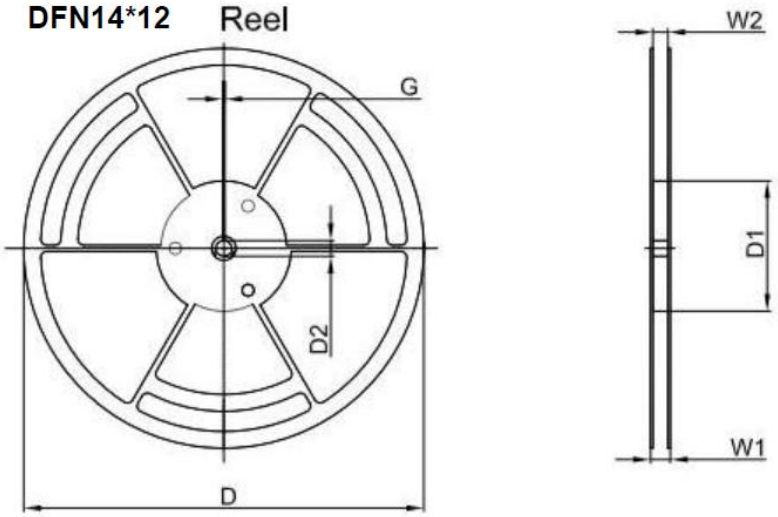
DFN14*12 Suggested Pad Layout



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

DFN14*12 Tape and Reel

DFN14*12 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	/