CHONGQING CLOUDCHILD TECHNOLOGY CO.,LTD

DFN14*12 Plastic-Encapsulate MOSFETS

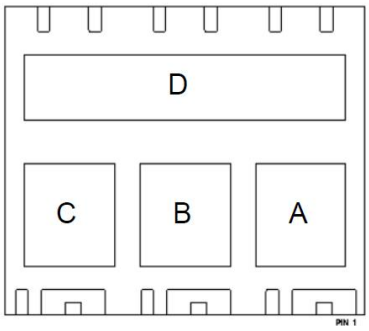
CCM110N4-6A Full bridge N Channel MOSFET

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

DESCRIPTION

The CCM110N4-6A 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

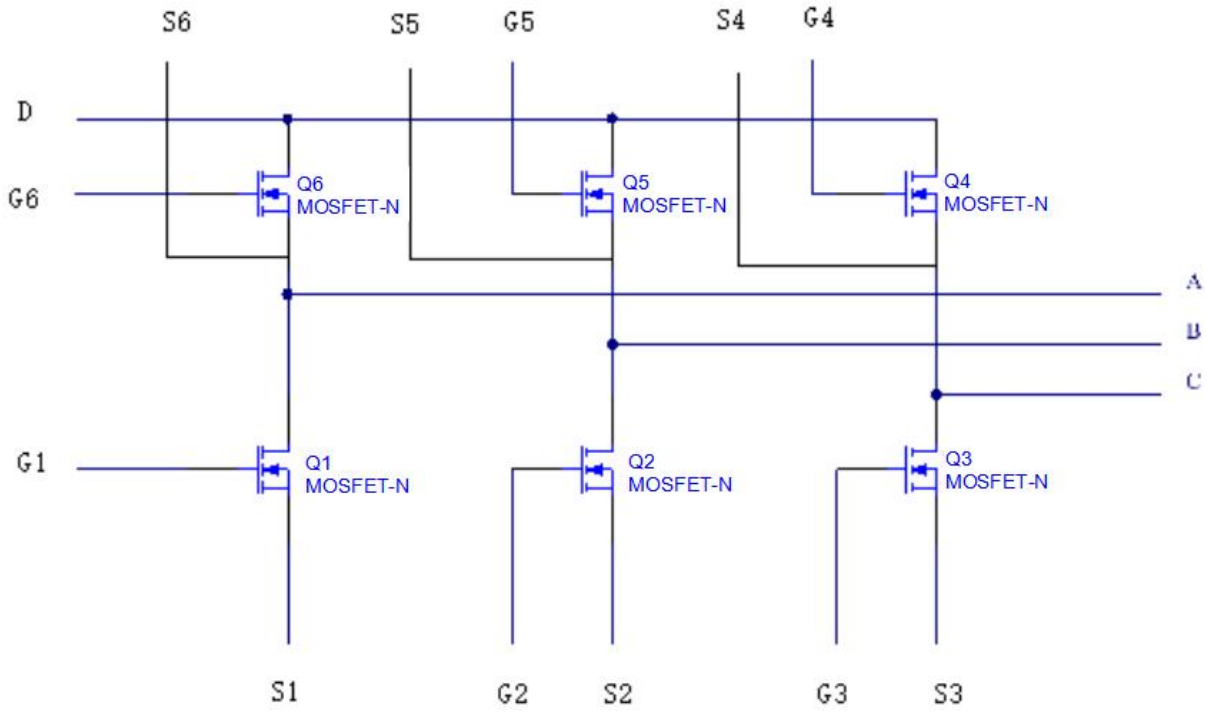
- motor control
- Full bridge module

MARKING

CCM110N4-6A =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	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	83	W
Thermal Resistance from Junction to Case[1]	$R_{\theta JC}$	1.8	℃/W
Thermal Resistance from Junction to Ambient[1]	$R_{\theta JA}$	60	℃/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 Rthic=1.8℃/W the chip is able to carry 123 A at 25℃.

2. P_W≤10μs, Duty cycle≤1%.

3. EAS condition: V_{DD}=25V,V_{GS}=10V,,ID=38A, L=0.5mH, R_g=25Ω,Starting T_J =25℃.

MOSFET ELECTRICAL CHARACTERISTICS

TC=25℃ 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 =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_{DS} =0V, V_{GS} =±20V			±100	nA
On characteristics[4]						
Gate-threshold voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =250μA	2.0	2.5	4.0	V
Static drain-source on-sate resistance	$R_{DS(on)}$	V_{GS} =10V, I_D =50A		3.5	4.0	mΩ
Forward transconductance	g_{FS}	V_{DS} =10V, I_D =10A		64		S
Dynamic characteristics[34]						
Input capacitance	C_{iss}	V_{DS} =25V,V_{GS} =0V, f =1MHz		2263	2942	pF
Output capacitance	C_{oss}			477	620	
Reverse transfer capacitance	C_{rss}			17.6	23	
Gate resistance	R_g	f =1MHz，V_{DS}=0		3		Ω
Switching characteristics [34]						
Total gate charge	Q_g	V_{GS}=10V, V_{DD}=20V, I_D=50A		32		nC
Gate-source charge	Q_{gs}			6		
Gate-drain charge	Q_{gd}			3.9		
Turn-on delay time	$t_{d(on)}$	V_{DD}=20V,R_L=1Ω , V_{GS}=10V,R_G=3Ω		7		ns
Turn-on rise time	t_r			2.8		
Turn-off delay time	$t_{d(off)}$			24		
Turn-off fall time	t_f			3.9		
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]	Is	-			110	A
Pulsed drain-source diode forward current[2]	I_{SM}	-			440	A
Reverse recovery time	Trr	I_F=100A，dI/dt=100A/us，V_R=20V		26		ns
Reverse recovery charge	Qrr			28		nC

Note :

1.Current is limited by package;with a Rthic=1.8℃/W the chip is able to carry 123 A at 25℃.

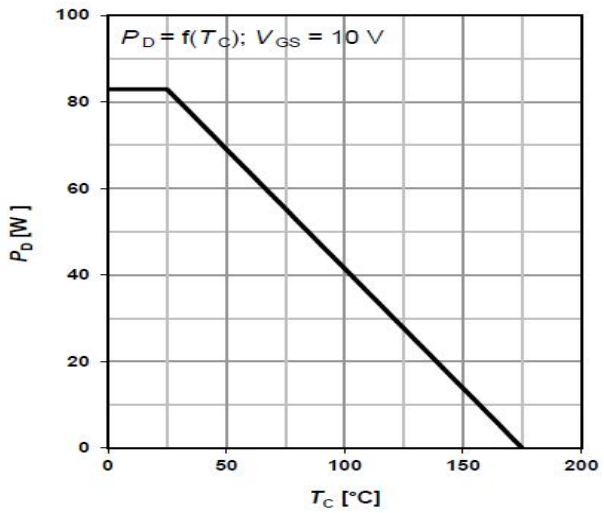
2.P_W≤10μs, Duty cycle≤1%.

3.Guaranteed by design, not subject to production.

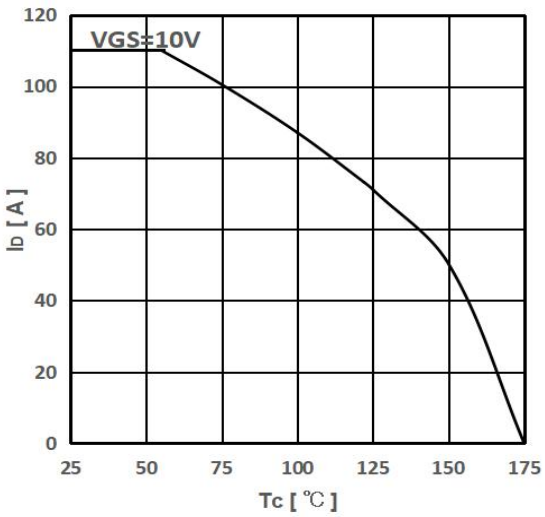
4.Pulse Test : Pulse Width≤300μs, duty cycle≤2%.

Typical Characteristics

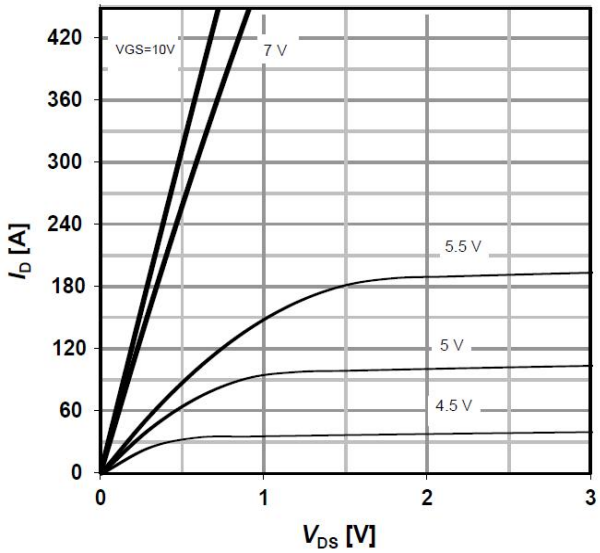
PD--Tc



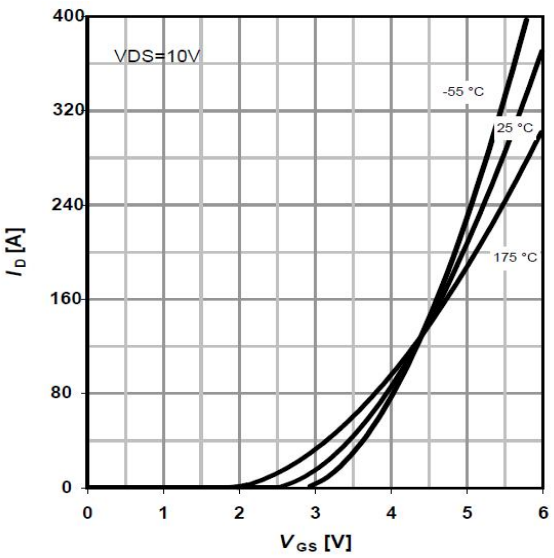
ID --- Tc



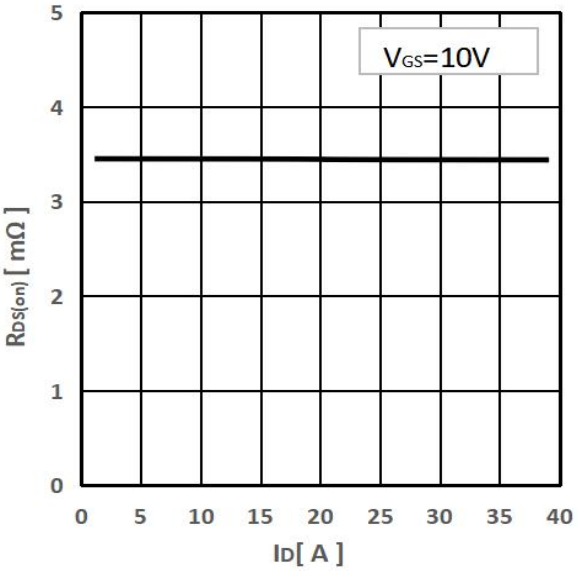
ID --- VDS



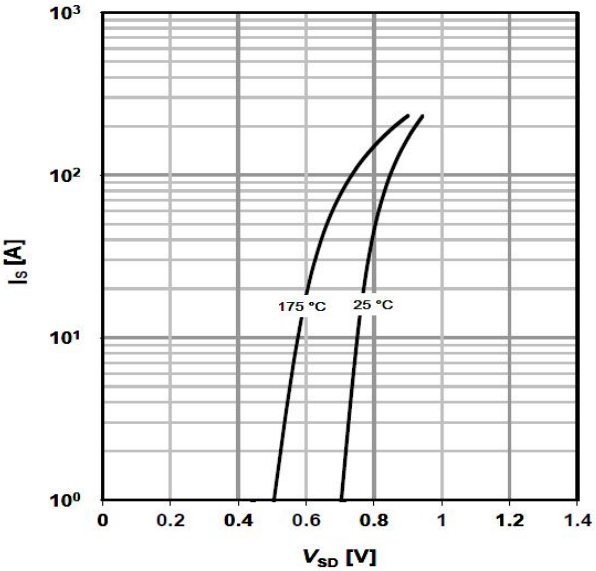
ID --- VGS



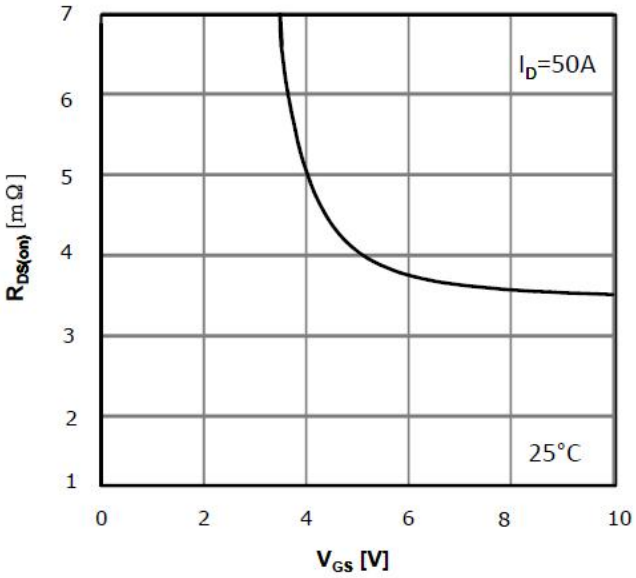
RDS(on) – I D



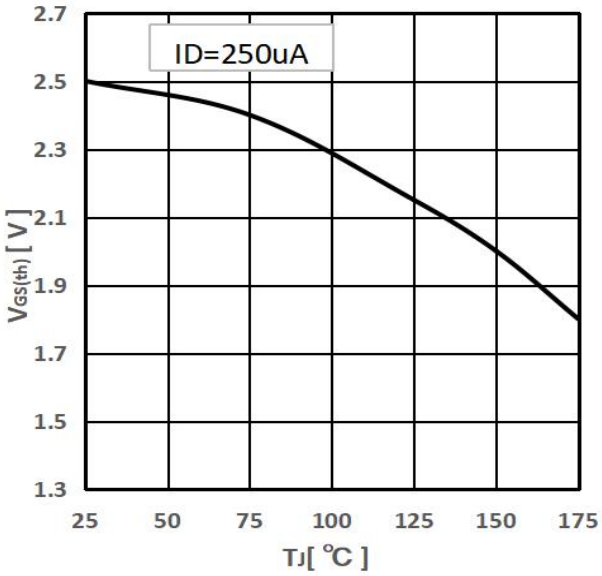
Is --VSD



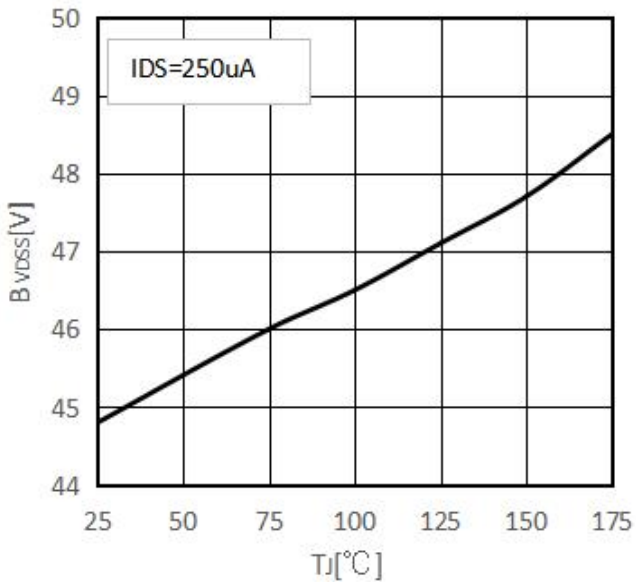
RDS(on) -- VGS



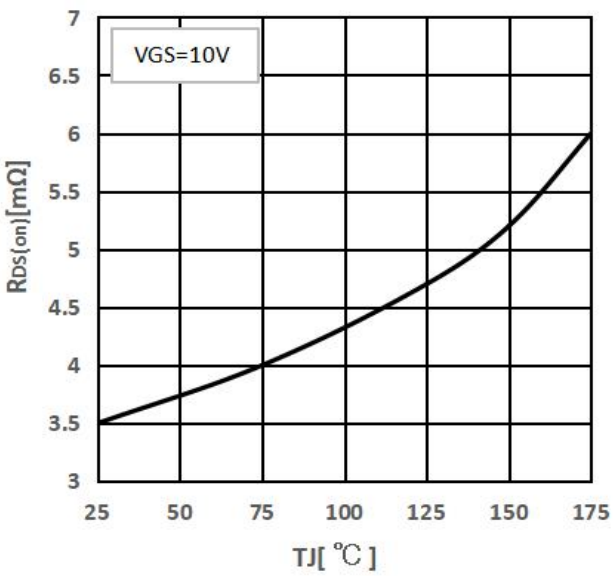
Threshold Voltage



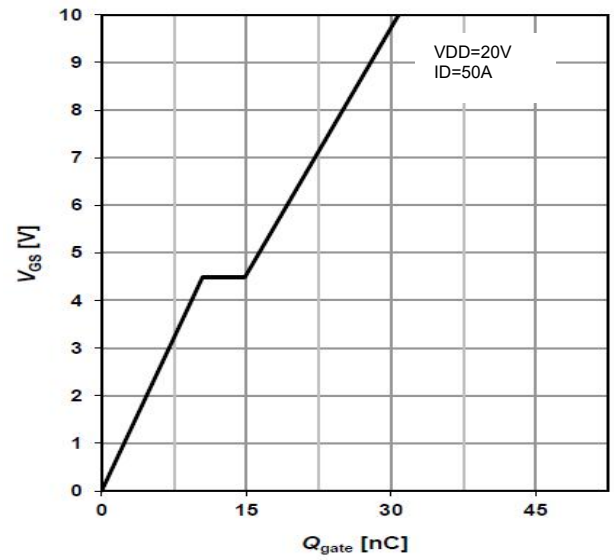
Drain-source breakdown voltage



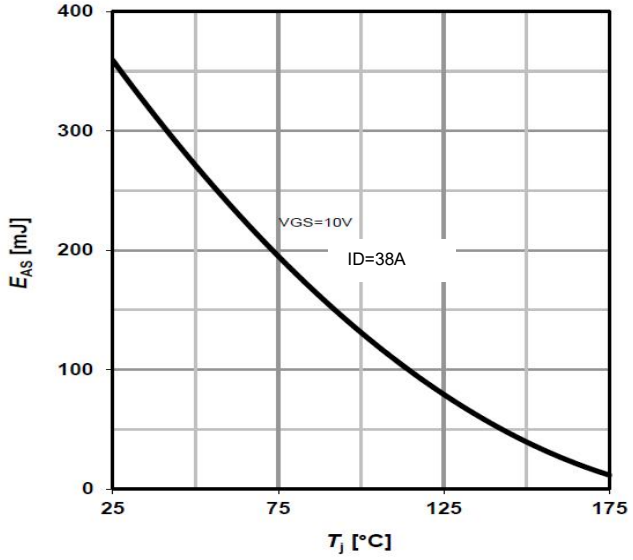
RDS(on) -- TJ



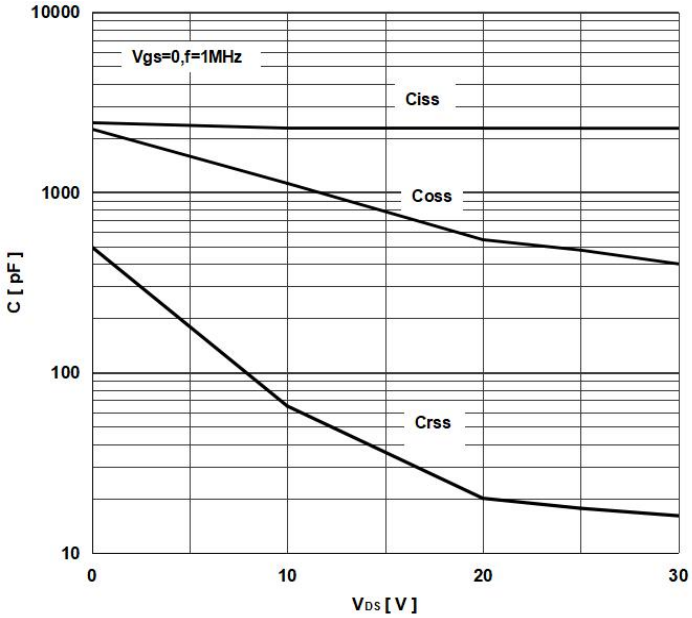
Typ.gate charge



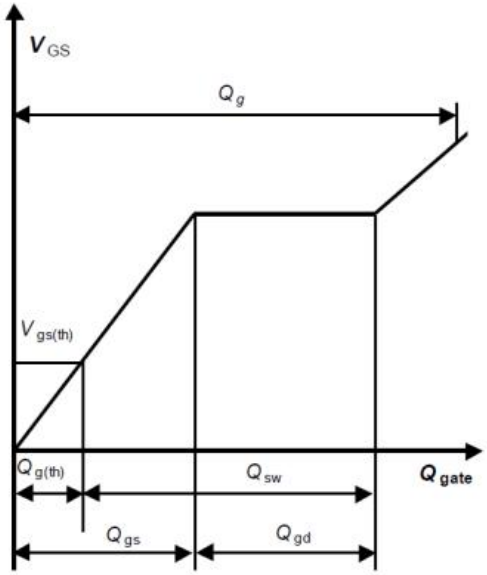
Avalanche energy



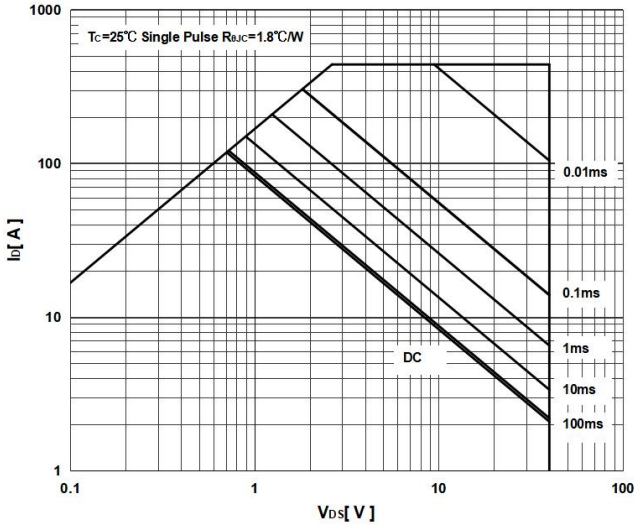
Typ.capacitances



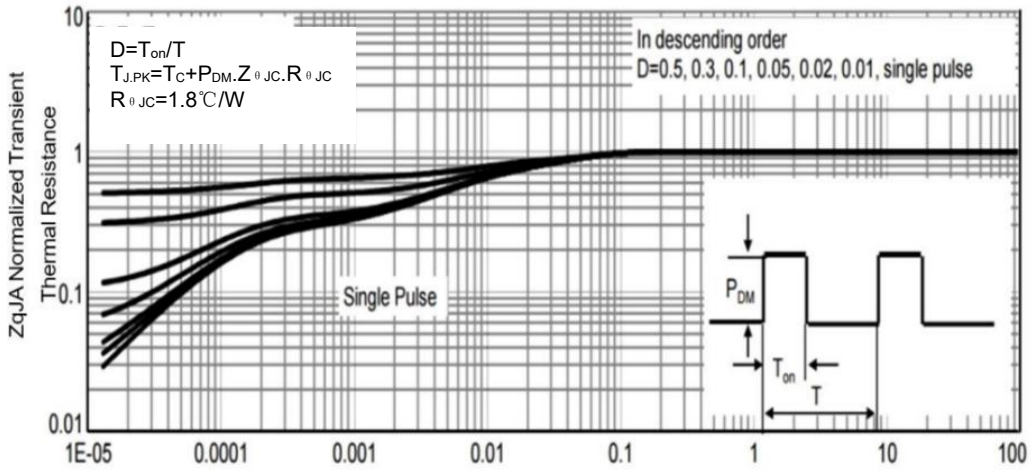
Gate charge waveforms



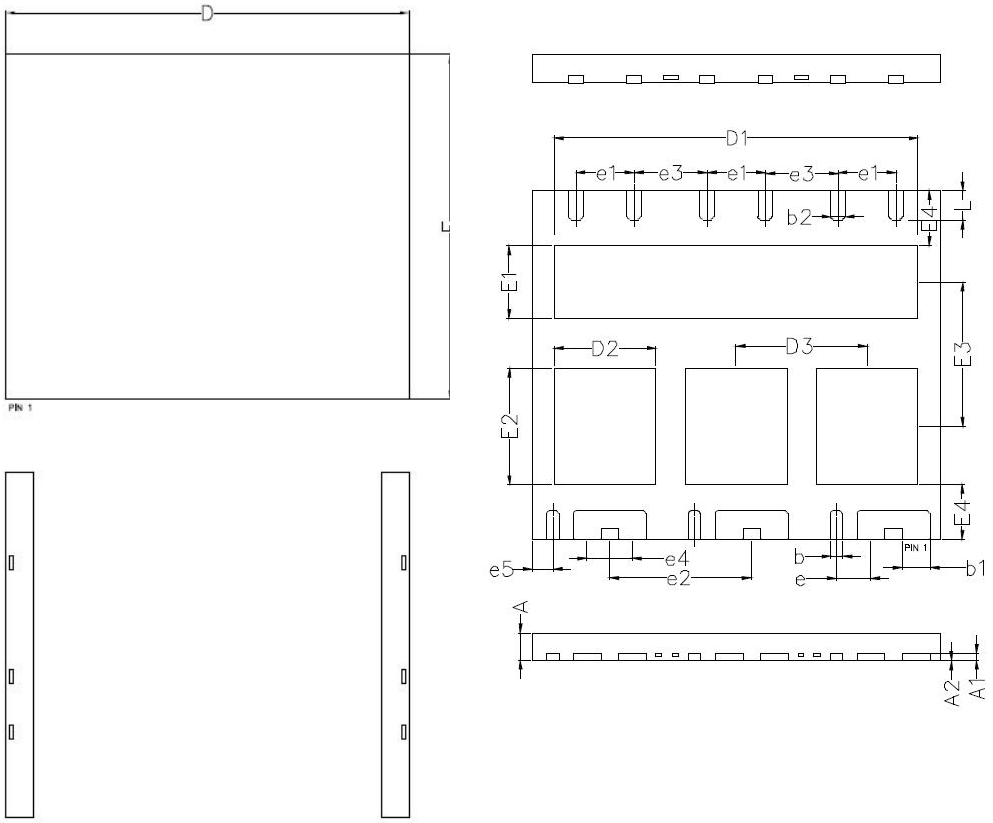
Maximum Forward Biased Safe Operating Area



Normalized Thermal Transient Impedance

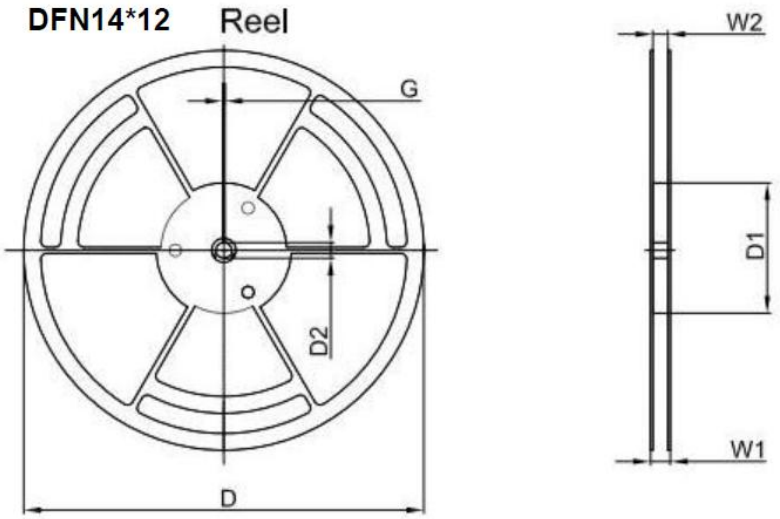


DFN14*12 Package Outline Dimensions



SYMBOL	DIMENSIONS		
	MIN.	NOM.	MAX.
A	1.05	1.1	1.15
A1		0.254 Ref	
A2	0.00	0.02	0.05
b	0,35	0,40	0,45
b1	0,90	0,95	1,00
b2	0.45	0.5	0.55
D	13,90	14,00	14,10
D1	12.45	12.50	12.55
D2	3,45	3,50	3,55
D3	4,45	4,50	4,55
E	11,90	12.00	12.10
E1	2.45	2.50	2.55
E2	3,95	4,00	4,05
E3	4,90	4,95	5,00
E4		1.9	
e		1.17 BSC	
e1		2,00 BSC	
e2		4,88BSC	
e3		2.50 BSC	
e4		1.55 BSC	
e5		0,70 BSC	
L	0,95	1.00	1.05

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
2023/12/13	A/0	/