



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

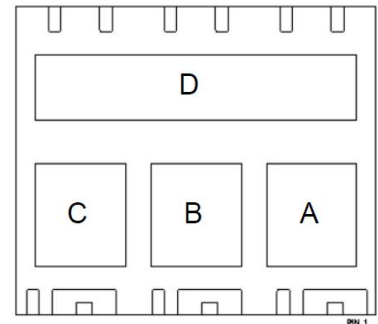


DESCRIPTION

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 $R_{DS(on)}$
- Low Gate Charge
- Low Gate Resistance
- AEC Q101 qualified



APPLICATION

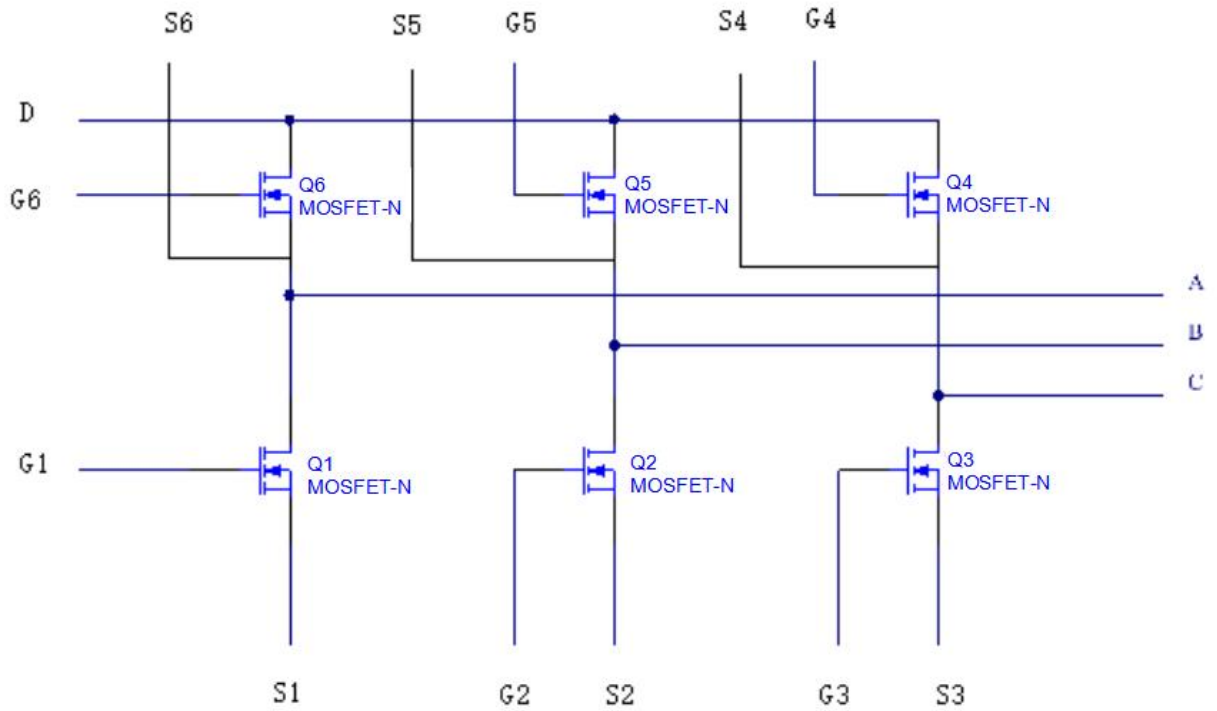
- motor control
- Full bridge module

MARKING



CCM110N4-6A =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_a=25°C 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 _{θJC}	1.8	°C/W
Thermal Resistance from Junction to Ambient ¹	R _{θJA}	60	°C/W
Operating Junction and Storage Temperature Range	T _J , T _{STG}	-55~ +175	°C
Soldering Temperature , for 10S(1.6mm from case)	-	260	°C

Notes:

1. Current is limited by package; with a R_{thic}=1.8°C/W the chip is able to carry 123 A at 25°C.
2. P_w≤10μs, Duty cycle≤1%.
3. EAS condition: V_{DD}=25V, V_{GS}=10V, I_D=38A, L=0.5mH, R_g=25Ω, Starting T_J =25°C.

MOSFET ELECTRICAL CHARACTERISTICS

TC=25°C unless otherwise specified

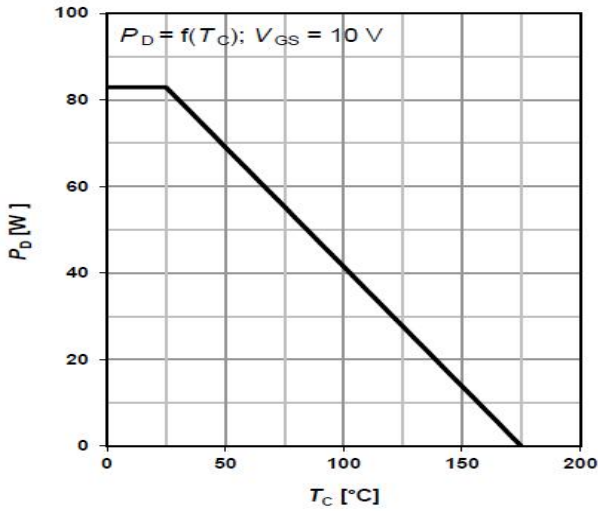
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Off characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	40			V
Zero gate voltage drain current	I_{DSS}	$V_{DS} = 40V, V_{GS} = 0V$			1	μA
Gate-body leakage current	I_{GSS}	$V_{DS} = 0V, V_{GS} = \pm 20V$			± 100	nA
On characteristics⁴						
Gate-threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	2.0	2.5	4.0	V
Static drain-source on-state resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 50A$		3.5	4.0	m Ω
Forward transconductance	g_{fs}	$V_{DS} = 10V, I_D = 10A$		64		S
Dynamic characteristics³⁴						
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 characteristics³⁴						
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	$t_{d(on)}$	$V_{DD} = 20V, R_L = 1\Omega,$ $V_{GS} = 10V, R_G = 3\Omega$		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	I_S	-			110	A
Pulsed drain-source diode forward current ²	I_{SM}	-			440	A
Reverse recovery time	T_{rr}	$I_F = 100A,$ $dI/dt = 100A/\mu s, V_R = 20V$		26		ns
Reverse recovery charge	Q_{rr}				28	

Note :

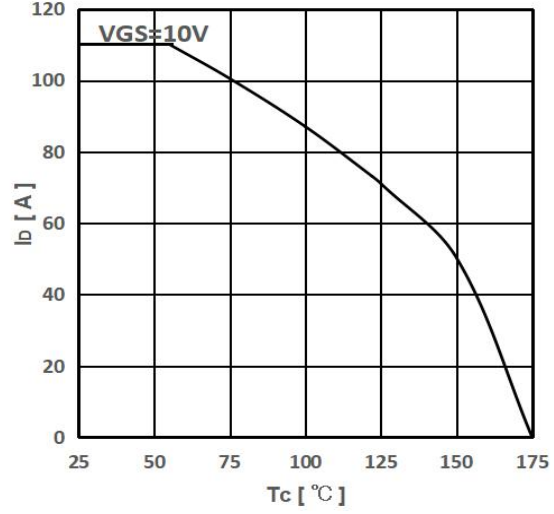
- 1.Current is limited by package;with a $R_{thic} = 1.8^\circ C/W$ the chip is able to carry 123 A at 25°C.
2. $P_W \leq 10\mu s$, Duty cycle $\leq 1\%$.
- 3.Guaranteed by design, not subject to production.
- 4.Pulse Test : Pulse Width $\leq 300\mu s$, duty cycle $\leq 2\%$.

Typical Characteristics

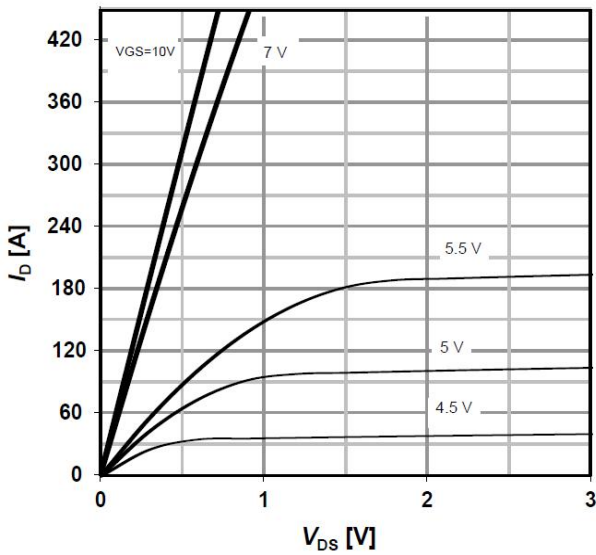
PD-Tc



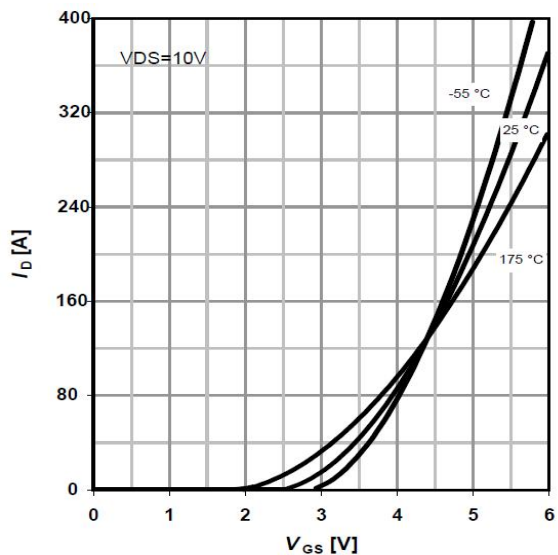
ID - Tc



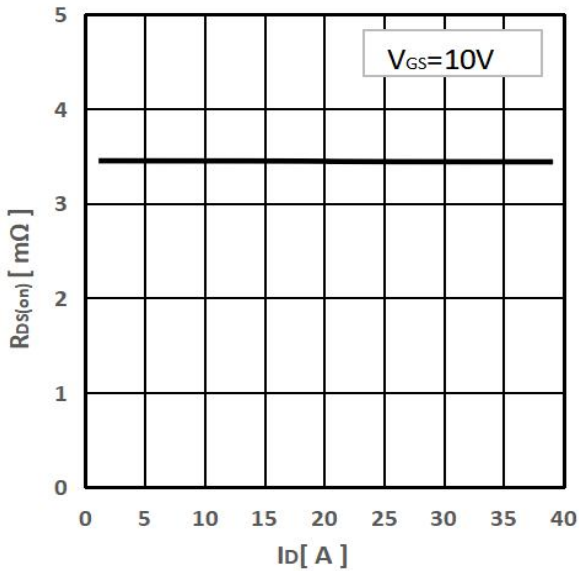
ID - VDS



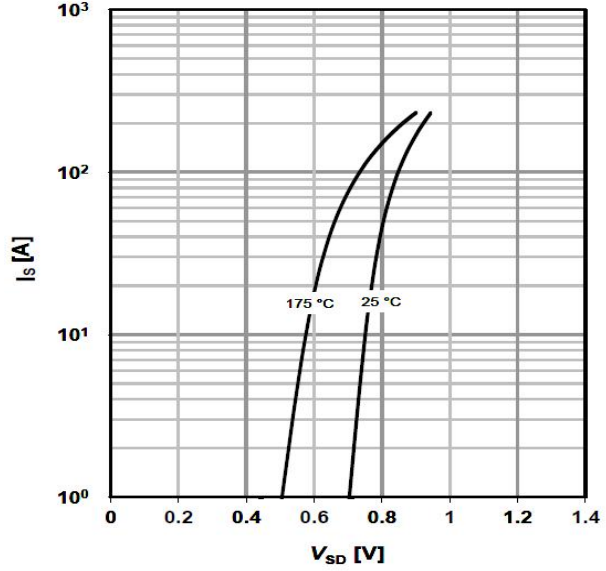
ID - VGS



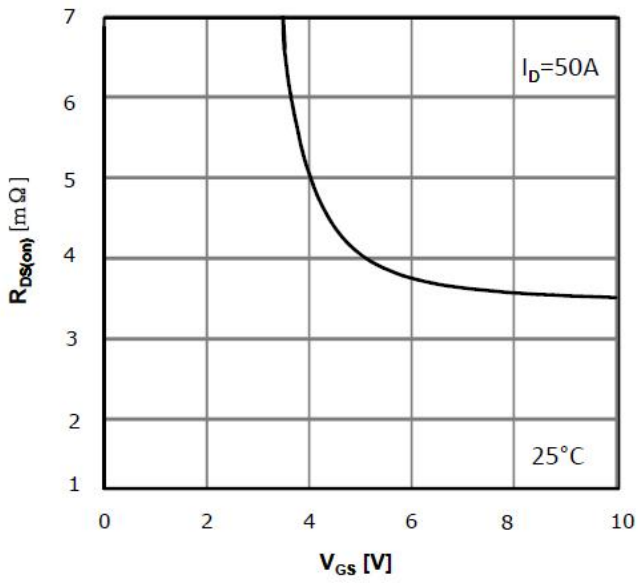
RDS(on) - ID



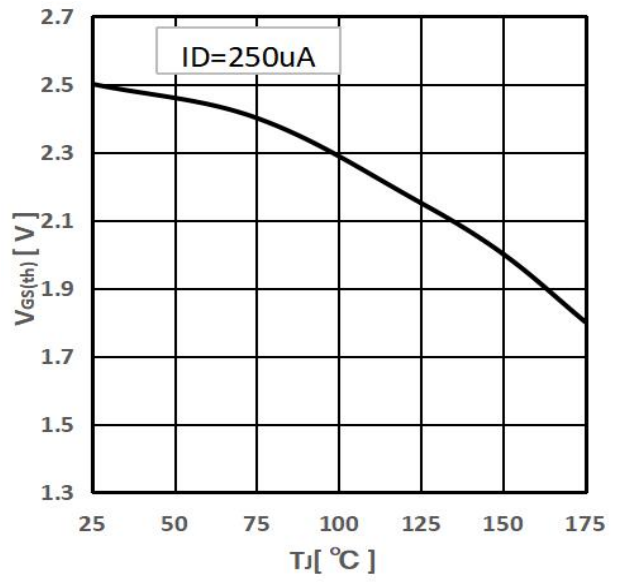
IS - VSD



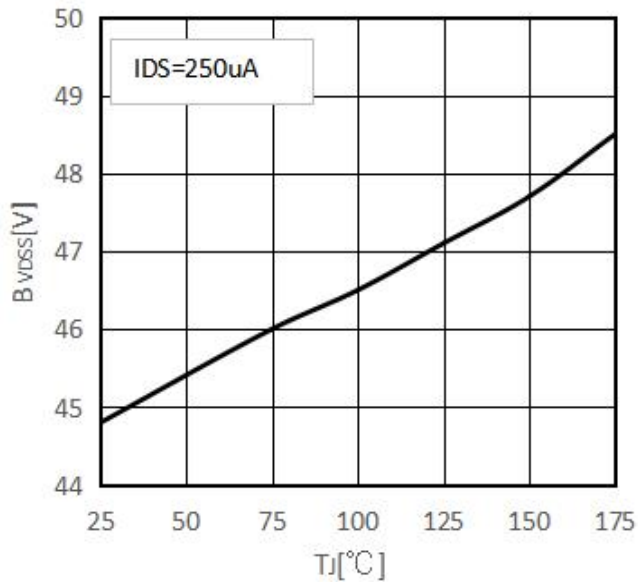
RDS(on) -- VGS



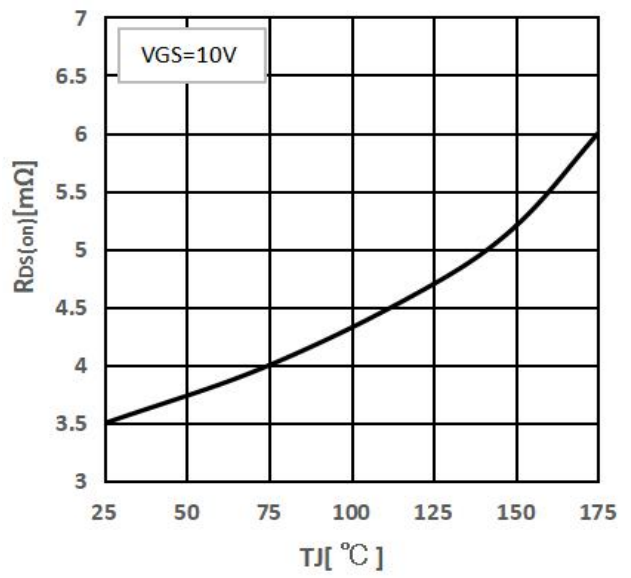
Threshold Voltage



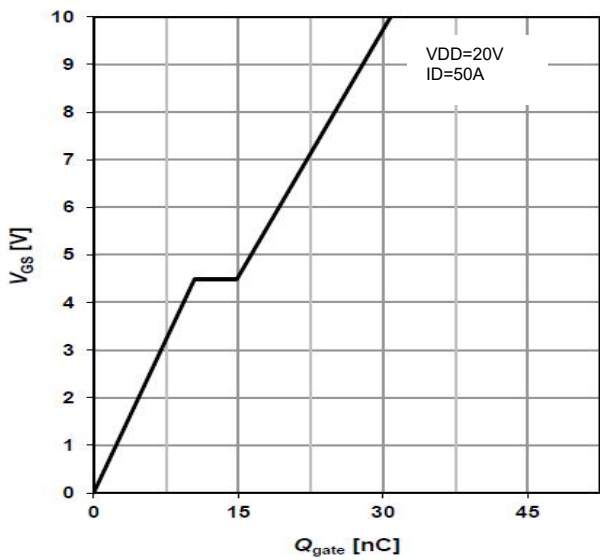
Drain-source breakdown voltage



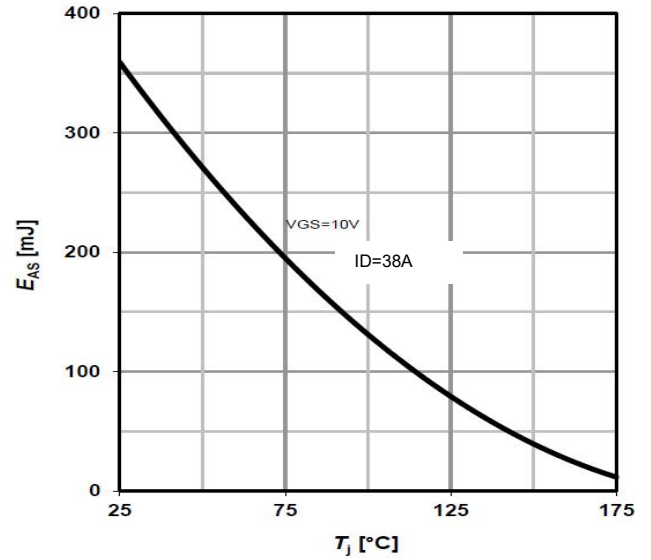
RDS(on) -- TJ



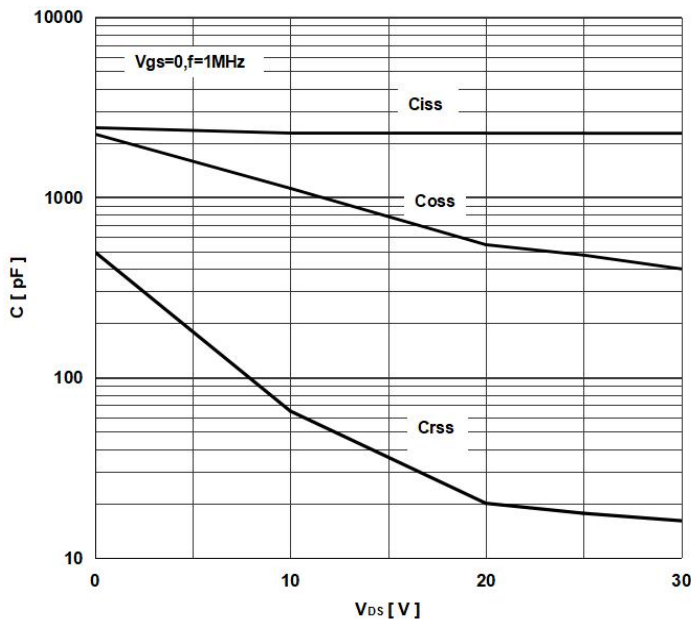
Typ.gate charge



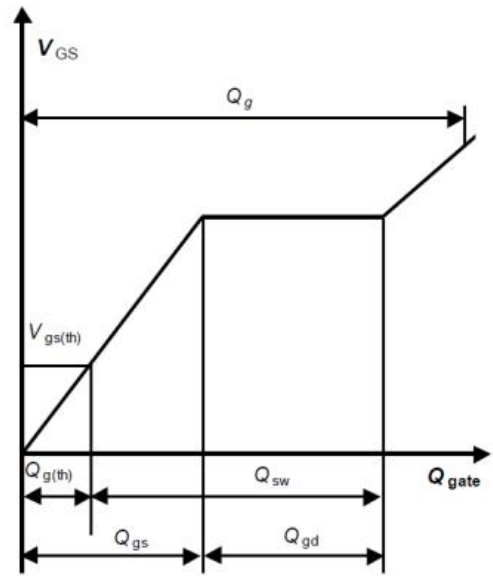
Avalanche energy



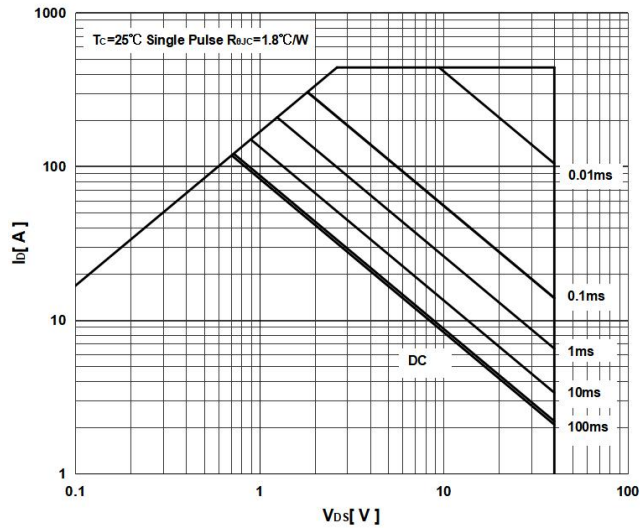
Typ. capacitances



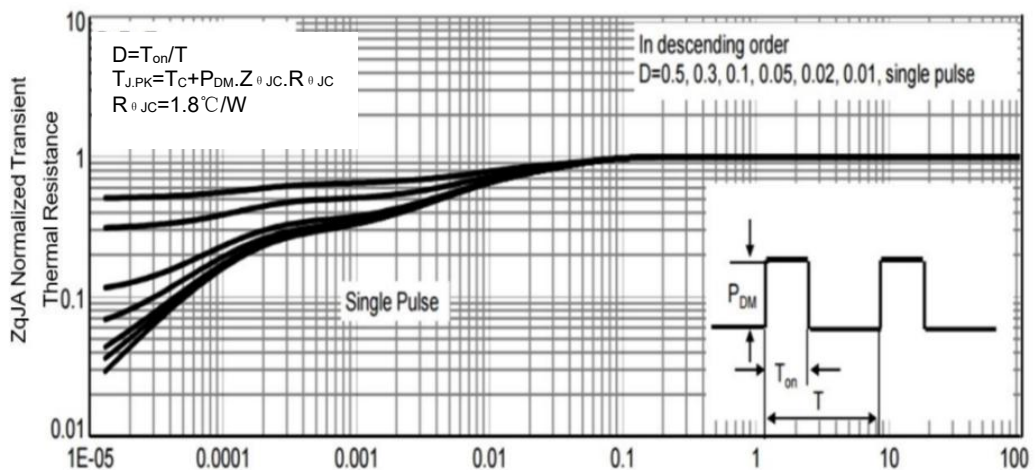
Gate charge waveforms



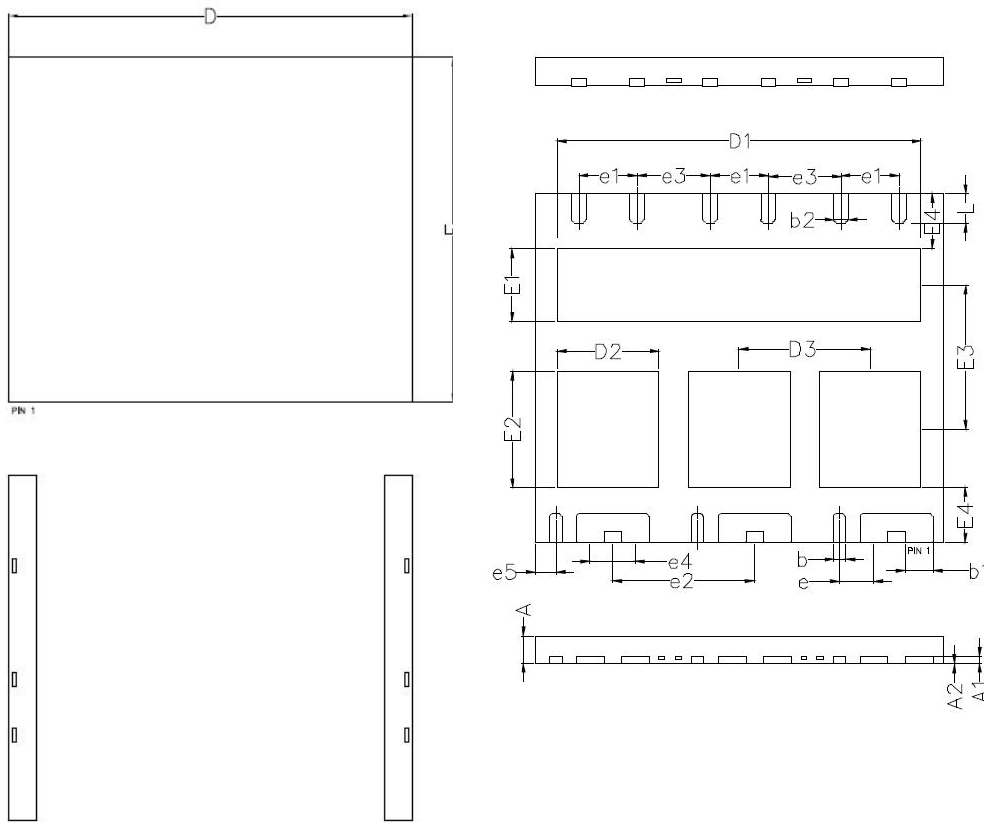
Maximum Forward Biased Safe Operating Area



Normalized Thermal Transient Impedance



DFN14*12 Package Outline Dimensions



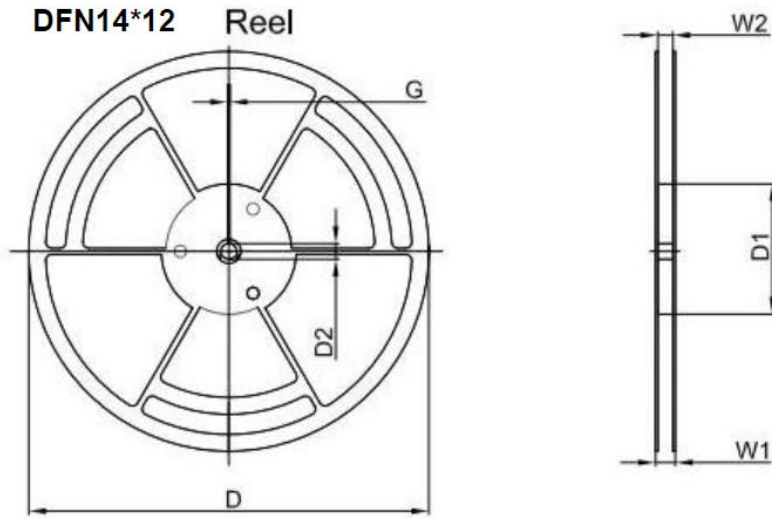
SYMBOL	DIMENSIONS		
	MIN.	NOM.	MAX.
A	1.05	1.1	1.15
A1	0.254 Ref		
A2	0.00	0.02	0.05
b	0.35	0.40	0.45
b1	0.90	0.95	1.00
b2	0.45	0.5	0.55
D	13.90	14.00	14.10
D1	12.45	12.50	12.55
D2	3.45	3.50	3.55
D3	4.45	4.50	4.55
E	11.90	12.00	12.10
E1	2.45	2.50	2.55
E2	3.95	4.00	4.05
E3	4.90	4.95	5.00
E4		1.9	
e	1.17 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

NOTICE

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DFN14*12 Tape and Reel



Dimensions are in millimeter						
Reel Option	D	D1	D2	G	W1	W2
13"D1a	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	/