



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

CCM150N4-6A Full bridge N Channel MOSFET

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
40 V	2.0mΩ@10V	150A

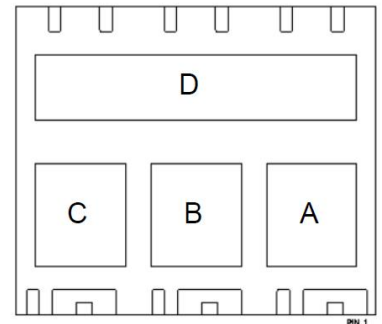


DESCRIPTION

The CCM150N4-6A 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

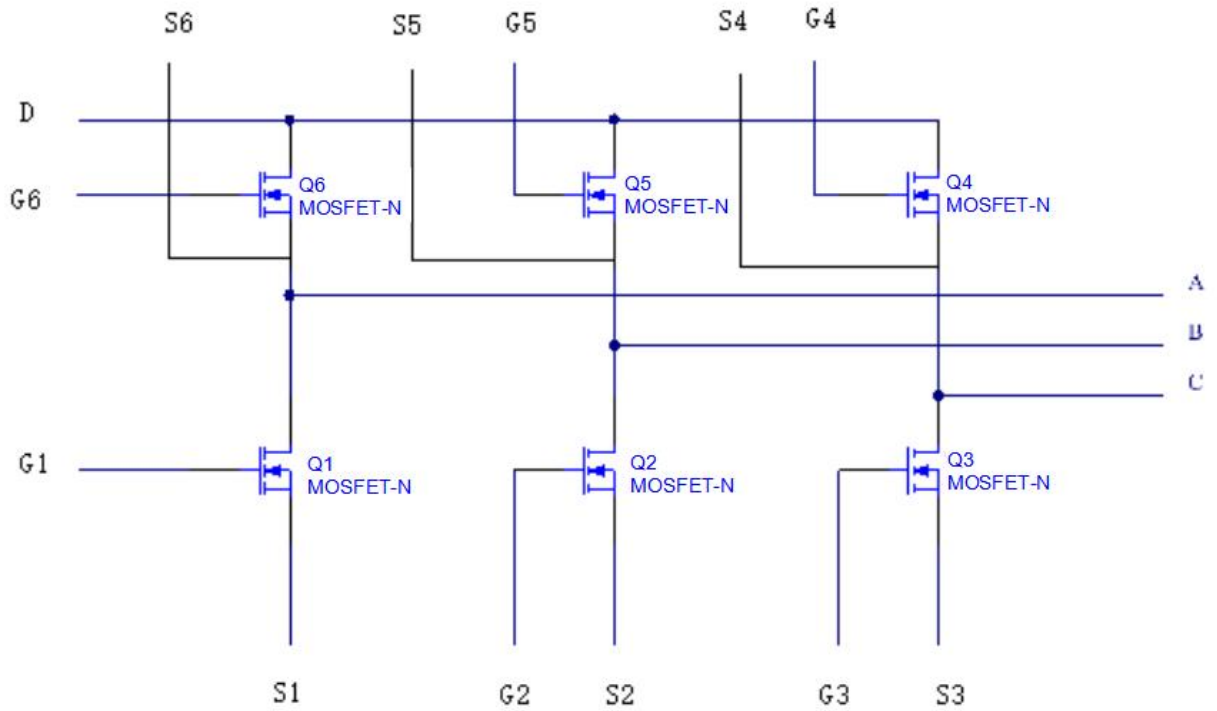
- motor control
- Full bridge module

MARKING



CCM150N4-6A =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=25C 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	150	A
Pulsed Drain Current ²	I _{DM}	600	A
Single Pulse Avalanche Energy ³	E _{AS}	900	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. T_C=25°C Limited only by maximum temperature allowed.
2. P_w≤10μs, Duty cycle≤1%.
3. EAS condition: V_{DD}=20V, V_{GS}=10V, I_D=60A, L=0.5mH, R_g=25Ω Starting T_J =25°C.

MOSFET ELECTRICAL CHARACTERISTICS

TC=25°C unless otherwise specified

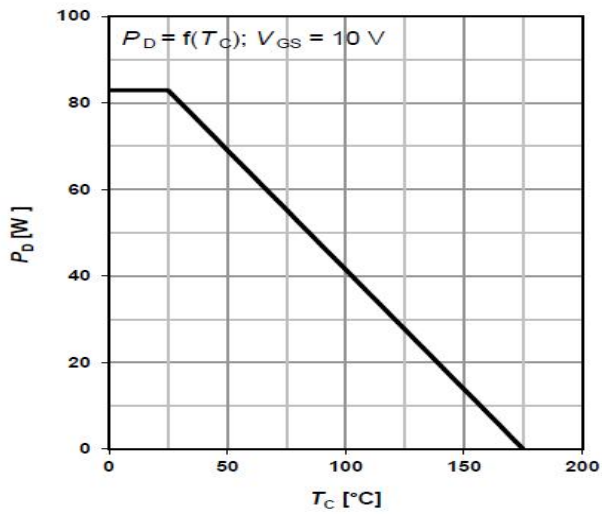
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Off characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	40			V
Zero gate voltage drain current	I_{DSS}	$V_{DS} = 40V, V_{GS} = 0V$			1	μA
Gate-body leakage current	I_{GSS}	$V_{DS} = 0V, V_{GS} = \pm 20V$			± 100	nA
On characteristics⁴						
Gate-threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	2.0	3.0	4.0	V
Static drain-source on-state resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 10A$		2.0	2.5	m Ω
Forward transconductance	g_{fs}	$V_{DS} = 10V, I_D = 10A$		72		S
Dynamic characteristics³⁴						
Input capacitance	C_{iss}	$V_{DS} = 25V, V_{GS} = 0V,$ $f = 1MHz$		6570		pF
Output capacitance	C_{oss}			1580		
Reverse transfer capacitance	C_{rss}			137		
Gate resistance	R_g	$f = 1MHz$		3.9		Ω
Switching characteristics³⁴						
Total gate charge	Q_g	$V_{GS} = 10V, V_{DD} = 20V,$ $I_D = 20A$		44		nC
Gate-source charge	Q_{gs}			20		
Gate-drain charge	Q_{gd}			12		
Turn-on delay time	$t_{d(on)}$	$V_{DD} = 20V, R_L = 1\Omega,$ $V_{GS} = 10V, R_G = 3\Omega$		28		ns
Turn-on rise time	t_r			26		
Turn-off delay time	$t_{d(off)}$			46		
Turn-off fall time	t_f			32		
Drain-Source Diode Characteristics						
Drain-source diode forward voltage ⁴	V_{SD}	$V_{GS} = 0V, I_S = 1A$			1.0	V
Continuous drain-source diode forward Current ¹	I_S	-			150	A
Pulsed drain-source diode forward current ²	I_{SM}	-			600	A
Reverse recovery time	T_{rr}	$I_F = 50A, di/dt = 100A/\mu s,$ $V_R = 20V$		50		ns
Reverse recovery charge	Q_{rr}				52	

Note :

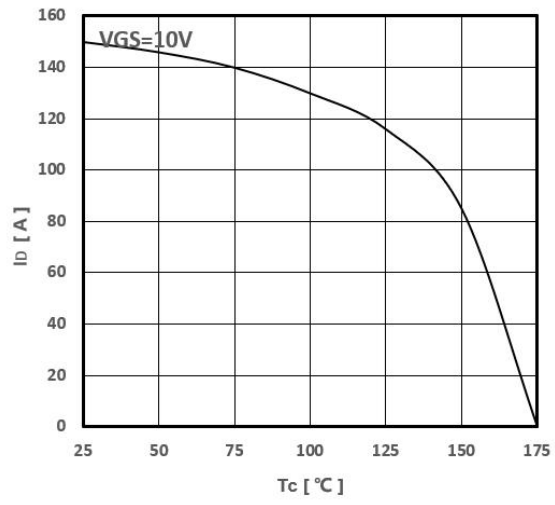
1. $T_C = 25^\circ C$ Limited only by maximum temperature allowed.
2. $P_w \leq 10\mu s$, Duty cycle $\leq 1\%$.
3. Guaranteed by design, not subject to production.
4. Pulse Test : Pulse Width $\leq 300\mu s$, duty cycle $\leq 2\%$.

Typical Characteristics

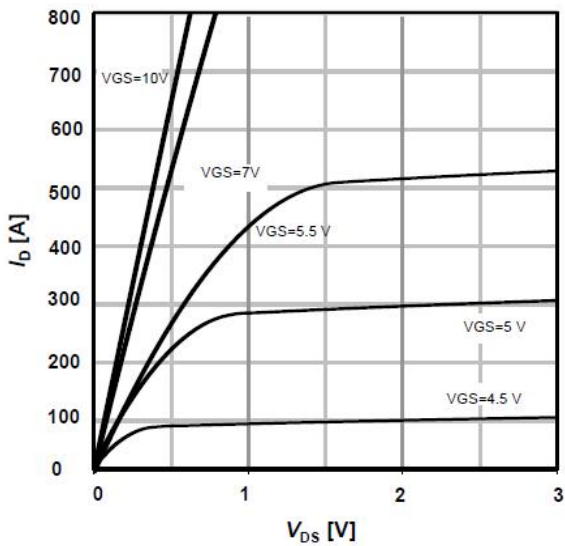
PD-Tc



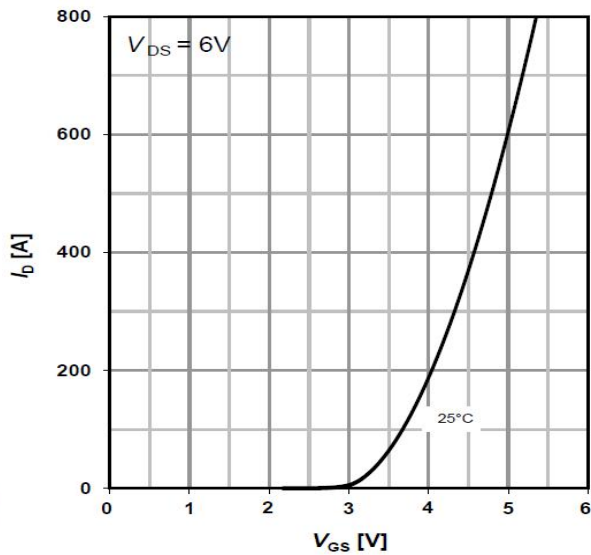
ID - Tc



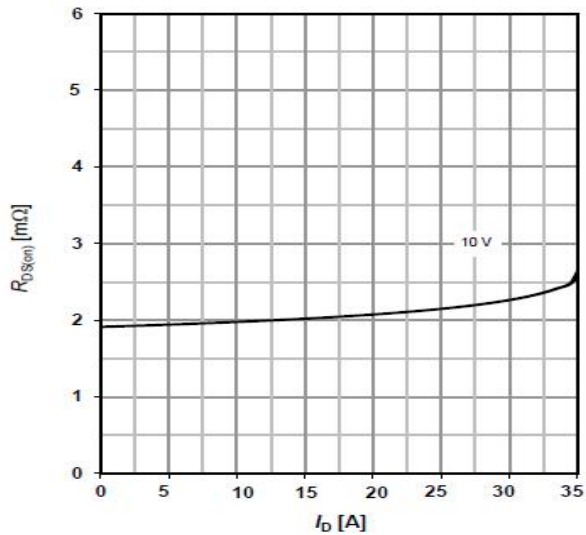
ID - VDS



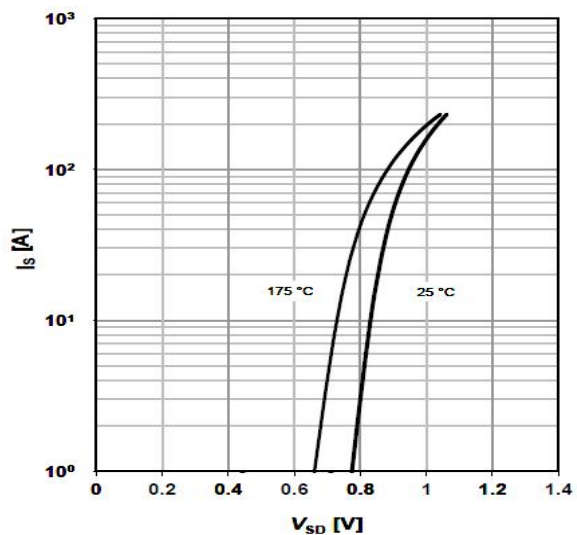
ID - VGS



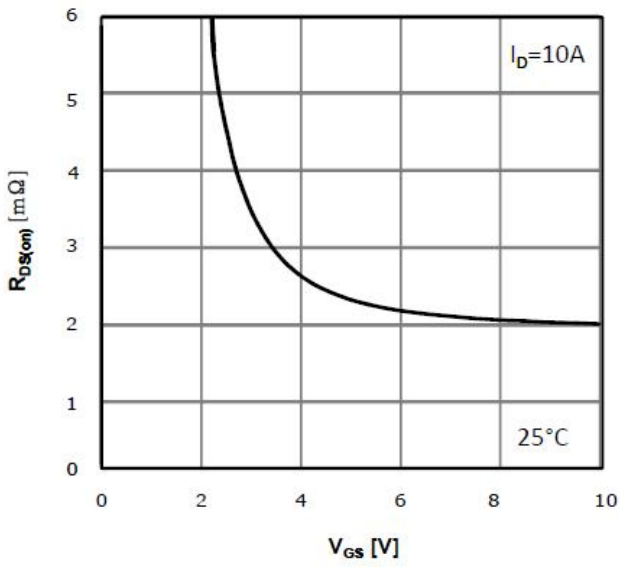
RDS(on) - ID



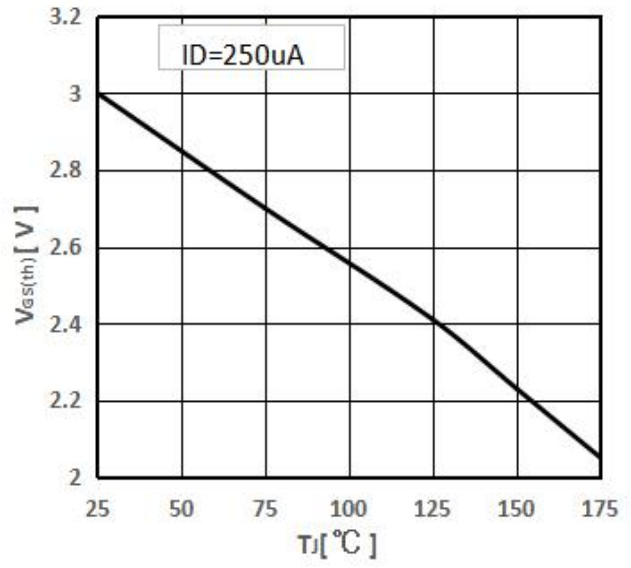
IS - VSD



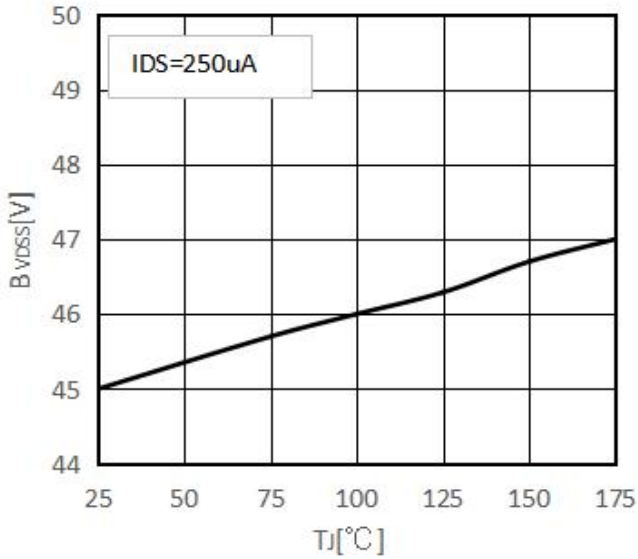
RDS(on) -- VGS



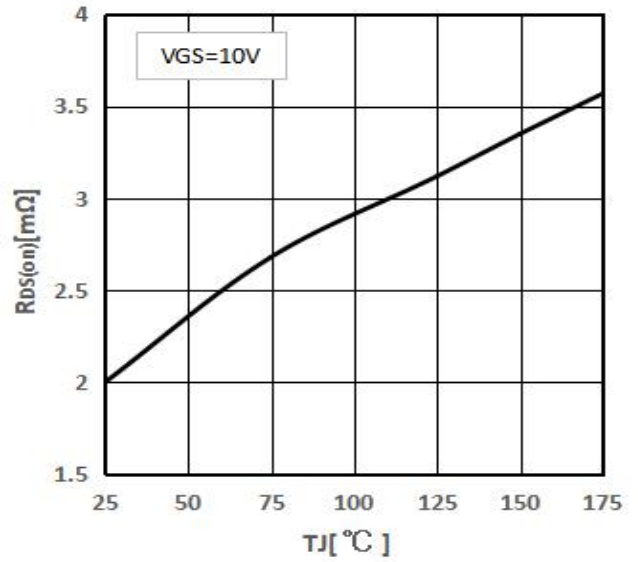
Threshold Voltage



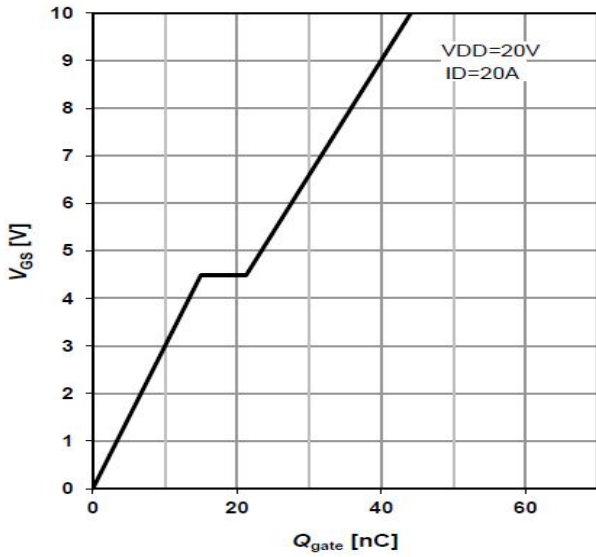
Drain-source breakdown voltage



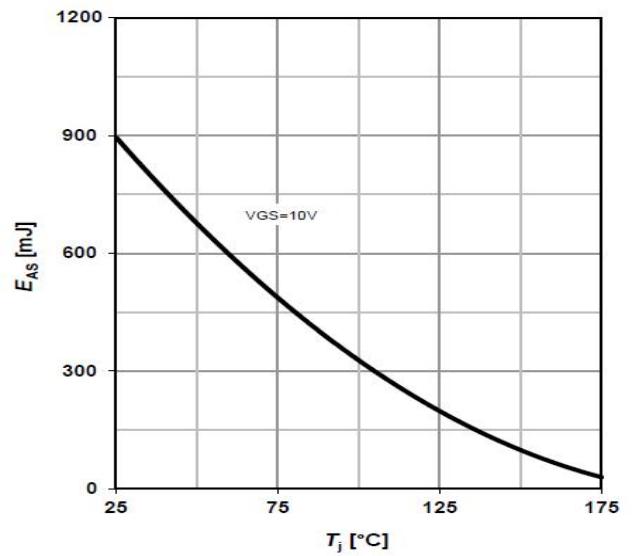
RDS(on) -- TJ



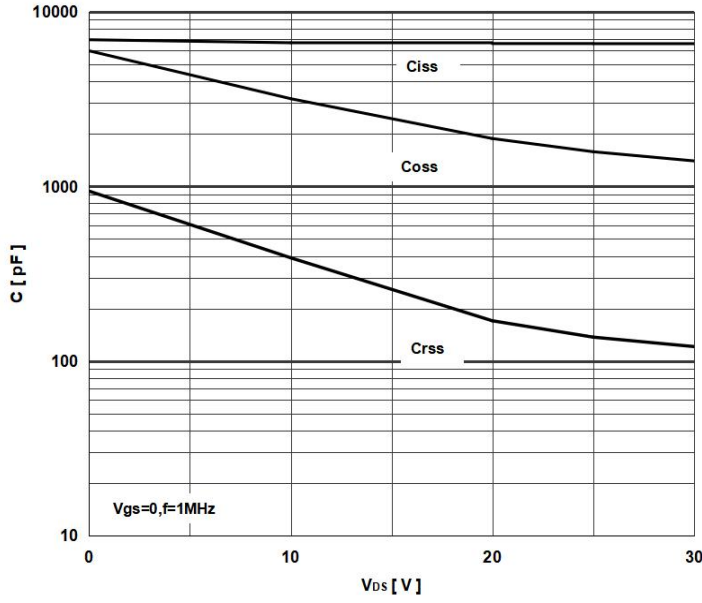
Typ.gate charge



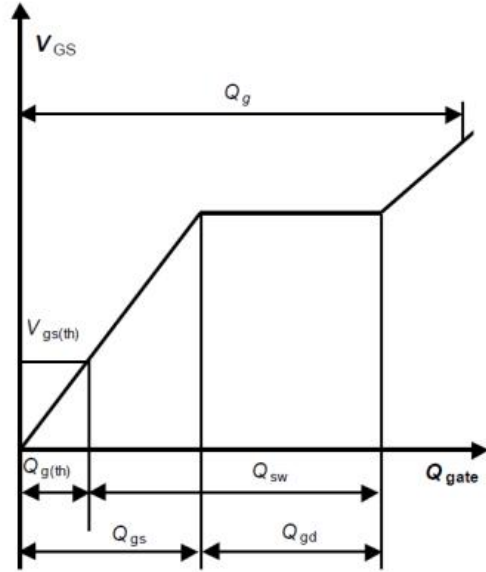
Avalanche energy



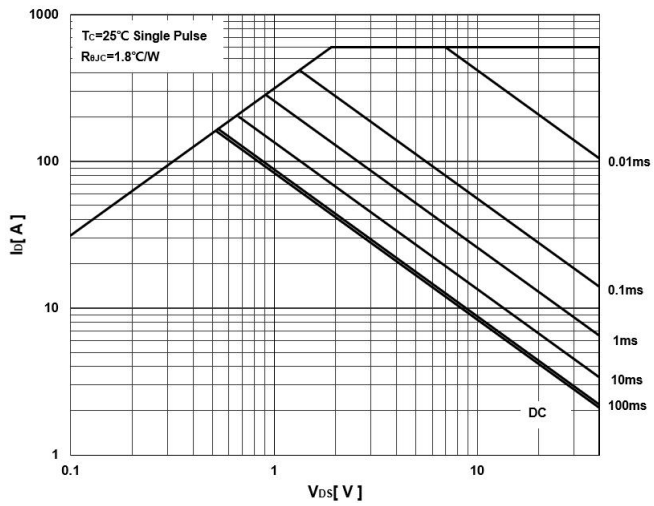
Typ. capacitances



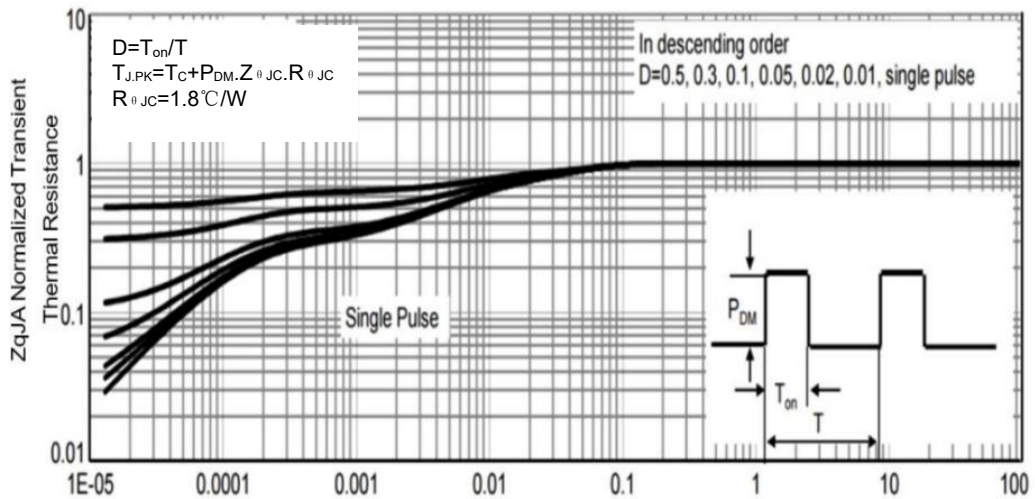
Gate charge waveforms



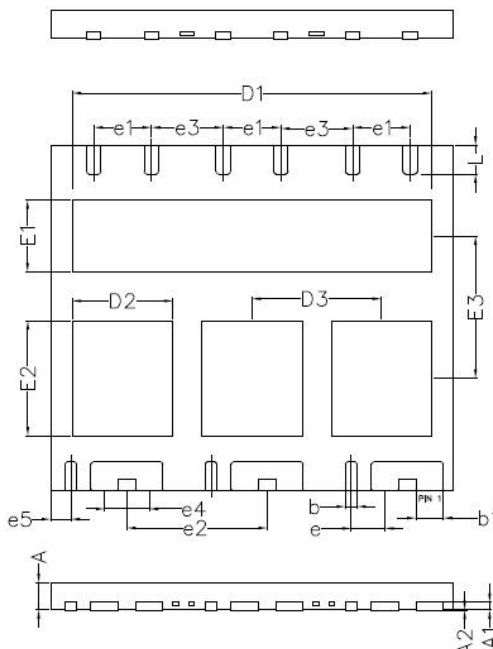
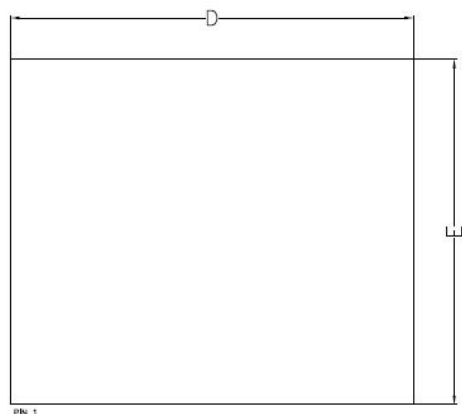
Maximum Forward Biased Safe Operating Area



Normalized Thermal Transient Impedance



DFN14*12 Package Outline Dimensions



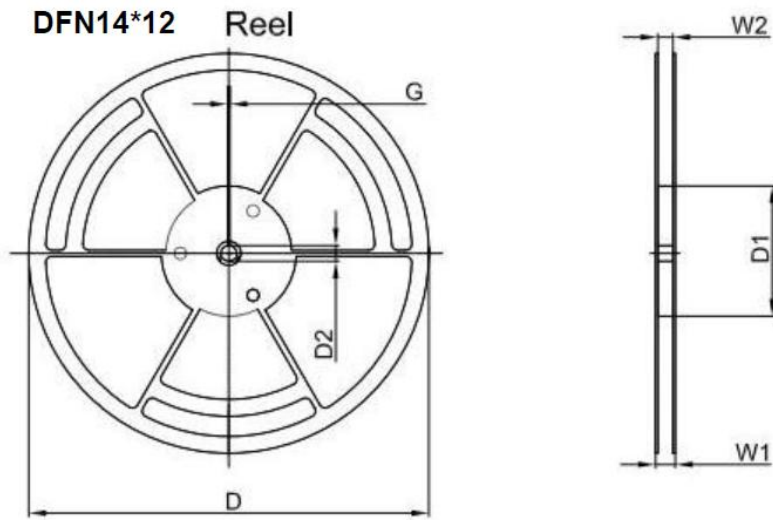
SYMBOL	DIMENSIONS		
	MIN.	NOM.	MAX.
A	0,90	0,95	1,00
A1	0,254 Ref		
A2	0,00	0,02	0,05
b	0,35	0,40	0,45
b1	0,90	0,95	1,00
D	13,90	14,00	14,10
D1	12,45	12,50	12,55
D2	3,45	3,50	3,55
D3	4,45	4,50	4,55
E	11,90	12,00	12,10
E1	2,45	2,50	2,55
E2	3,95	4,00	4,05
E3	4,90	4,95	5,00
e	1,17 BSC		
e1	2,00 BSC		
e2	4,88BSC		
e3	2,50 BSC		
e4	1,55 BSC		
e5	0,70 BSC		
L	0,95	1,00	1,05

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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
2023/05/05	A/0	/