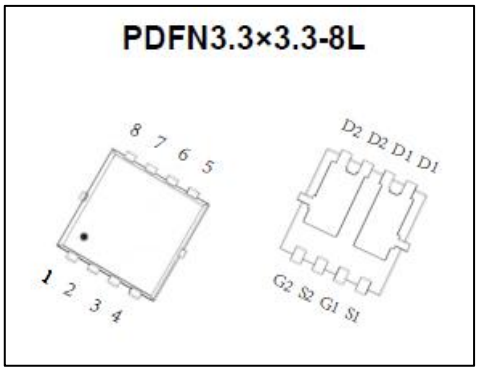
CHONGQING CLOUDCHILD TECHNOLOGY CO., LTD

PDFN3.3*3.3-8L Plastic-Encapsulate MOSFETS

CCM2G04D06T N+P Channel Power MOSFET

	N-CHANNEL	P-CHANNEL
V_{DS} (V)	60	-60
$R_{DS(on)}$ (mΩ) at V_{GS} = ± 10 V	30	62
$R_{DS(on)}$ (mΩ) at V_{GS} = ± 4.5 V	37	75
I_D (A)	5	-3.8



DESCRIPTION

The CCM2G04D06T provides excellent $R_{DS(ON)}$ with low gate charge.
It can be used in a wide variety of applications .

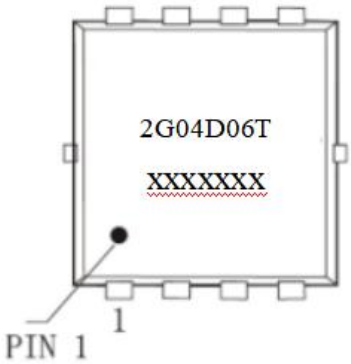
FEATURES

- Surface Mount Package
- Super High Density Cell Design for Extremely Low RDS(on)
- AEC Q101 qualified

APPLICATIONS

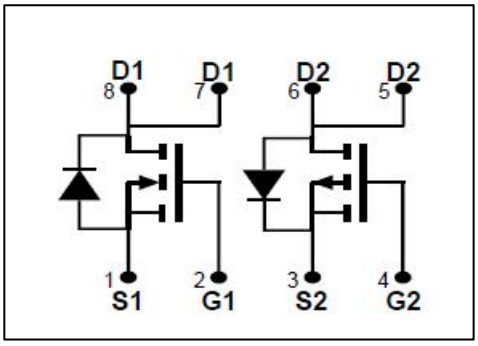
- CCFL Inverter
- Motor driven

MARKING



2G04D06T =Part No.
XXXXXXX = Code.

EQUIVALENT CIRCUIT



ABSOLUTE MAXIMUM RATINGS(T_c=25℃ unless otherwise noted)

Parameter	Symbol	N-CHANNEL	P-CHANNEL	Unit
Drain-Source Voltage	V_{DS}	60	-60	V
Gate-Source Voltage	V_{GS}	± 20		
Continuous Drain Current[13]	I_D	5	-3.8	A
Pulsed Drain Current[4]	I_{DM}	20	-16	
Single Pulse Avalanche Energy[2]	E_{AS}	2.25		mJ
Maximum Power Dissipation[3]	P_D	27		W
Thermal Resistance from Junction to Ambient[3]	RθJa	80		°C/W
Thermal Resistance from Junction to Case	RθJc	5.5		°C/W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55~ +175		℃
Lead Temperature for Soldering Purposes(1/8'' from case for 10 s)	T_L	260		℃

Notes:

1. The maximum current rating is limited by package.
2. EAS condition: V_{DD}=20V,V_{GS}=10V,,Ias=3A, L=0.5mH, R_g=25Ω Starting T_J =25℃.
3. Device mounted on 1in2 FR-4 board with 2oz. Copper, in a still air environment with TA =25°C.
4. Pulse Test : Pulse Width ≤ 10μs, duty cycle ≤ 1%.

MOSFET ELECTRICAL CHARACTERISTICS(TC=25℃ unless otherwise specified)

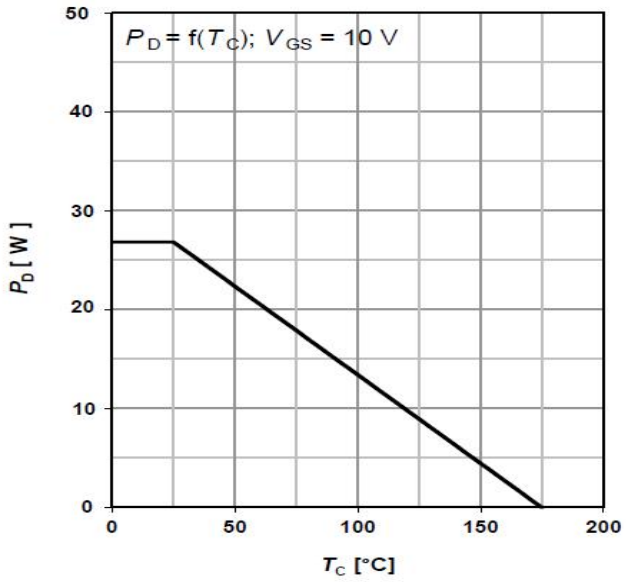
Parameter	Symbol	Test Condition			Min	Typ	Max	Unit
Off characteristics								
Drain-Source Breakdown Voltage	$V_{(BR)\ DSS}$	V_{GS} = 0 V, I_D = 250 μA		N-Ch	60			V
		V_{GS} = 0 V, I_D = - 250 μA		P-Ch	-60			
Gate-Source Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ± 20 V		N-Ch	-	-	±100	nA
				P-Ch	-	-	±100	
Zero Gate Voltage Drain Current	I_{DSS}	V_{GS} = 0 V	V_{DS} = 60 V	N-Ch	-	-	1	μA
		V_{GS} = 0 V	V_{DS} = -60 V	P-Ch	-	-	-1	
On characteristics[1]								
Gate-Source Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 μA		N-Ch	1.0	1.6	3.0	V
		V_{DS} = V_{GS}, I_D = - 250 μA		P-Ch	-1.0	-2.0	-3.0	V
Drain-Source On-State Resistance	$R_{DS(on)}$	V_{GS} = 10 V	ID = 5A	N-Ch	-	30	40	mΩ
		V_{GS} = -10 V	ID = -3.8A	P-Ch	-	62	80	
		V_{GS} = 4.5 V	ID = 3.9A	N-Ch	-	37	55	
		V_{GS} = -4.5 V	ID = -2A	P-Ch	-	75	110	
Forward Transconductance	g_{fs}	VDS = 15V, ID =4.3A		N-Ch	-	15	-	S
		VDS = -15 V, ID = -3.1A		P-Ch	-	8.5	-	
Dynamic characteristics								
Input Capacitance	C_{iss}	V_{GS} = 0 V	V_{DS} = 15 V, f = 1 MHz	N-Ch	-	665	865	pF
		V_{GS} = 0 V	V_{DS} = -15 V, f = 1 MHz	P-Ch	-	650	845	
Output Capacitance	C_{oss}	V_{GS} = 0 V	V_{DS} = 15 V, f = 1 MHz	N-Ch	-	75	97	
		V_{GS} = 0 V	V_{DS} = -15 V, f = 1 MHz	P-Ch	-	95	124	
Reverse Transfer Capacitance	C_{rss}	V_{GS} = 0 V	V_{DS} = 15 V, f = 1 MHz	N-Ch	-	40	52	
		V_{GS} = 0 V	V_{DS} = -15 V, f = 1 MHz	P-Ch	-	60	78	
Gate Resistance	R_g	f = 1 MHz		N-Ch		3		Ω
				P-Ch		20		
Switching characteristics								
Total Gate Charge	Q_g	V_{GS} = 4.5 V	V_{DD} = 30 V, I_D = 4.3A	N-Ch	-		9	nC
		V_{GS} = -4.5 V	V_{DD} = -30 V, I_D = -3.1A	P-Ch	-		12	
Gate-Source Charge	Q_{gs}	V_{GS} = 4.5V	V_{DD} = 30 V, I_D = 4.3A	N-Ch	-	2.3	-	
		V_{GS} = -4.5 V	V_{DD} = -30 V, I_D = -3.1A	P-Ch	-	2.2	-	
Gate-Drain Charge	Q_{gd}	V_{GS} = 4.5 V	V_{DD} = 30 V, I_D = 4.3A	N-Ch	-	2.6	-	
		V_{GS} = -4.5V	V_{DD} = -30 V, I_D = -3.1A	P-Ch	-	3.7	-	
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = 30 V,I_D=3.4A,V_{GS} =4.5 V, R_g = 1 Ω		N-Ch	-	25		ns
		V_{DD} = -30 V, I_D =-2.4A,V_{GS} = -4.5V, R_g = 1 Ω		P-Ch	-	45		
Rise Time	t_r	V_{DD} = 30 V,I_D=3.4A,V_{GS} =4.5 V, R_g = 1 Ω		N-Ch	-	100		
		V_{DD} = -30 V, I_D =-2.4A,V_{GS} = -4.5V, R_g = 1 Ω		P-Ch	-	105		
Turn-Off Delay Time	$t_{d(off)}$	V_{DD} = 30 V,I_D=3.4A,V_{GS} =4.5 V, R_g = 1 Ω		N-Ch	-	25		
		V_{DD} = -30 V, I_D =-2.4A,V_{GS} = -4.5V, R_g = 1 Ω		P-Ch	-	60		
Fall Time	t_f	V_{DD} = 30 V,I_D=3.4A,V_{GS} =4.5 V, R_g = 1 Ω		N-Ch	-	15		
		V_{DD} = -30 V, I_D =-2.4A,V_{GS} = -4.5V, R_g = 1 Ω		P-Ch	-	45		
Drain-Source Diode Characteristics								
Forward Voltage[1]	V_{SD}	I_S = 1.7A		N-Ch	-		1.2	V
		I_S = -2 A		P-Ch	-		-1.2	
Continuous drain-source diode forward Current	Is			N-Ch			5	A
				P-Ch			-3.8	
Pulsed Current	I_{SM}			N-Ch	-	-	20	A
				P-Ch	-	-	-16	
Reverse recovery time	Trr	I_F=4.5A，dI/dt=100A/us		N-Ch		10		ns
		I_F=-3.5A，dI/dt=100A/us		P-Ch		18		
Reverse recovery charge	Qrr	I_F=4.5A，dI/dt=100A/us		N-Ch		14		nC
		I_F=-3.5A，dI/dt=100A/us		P-Ch		12		

Notes:

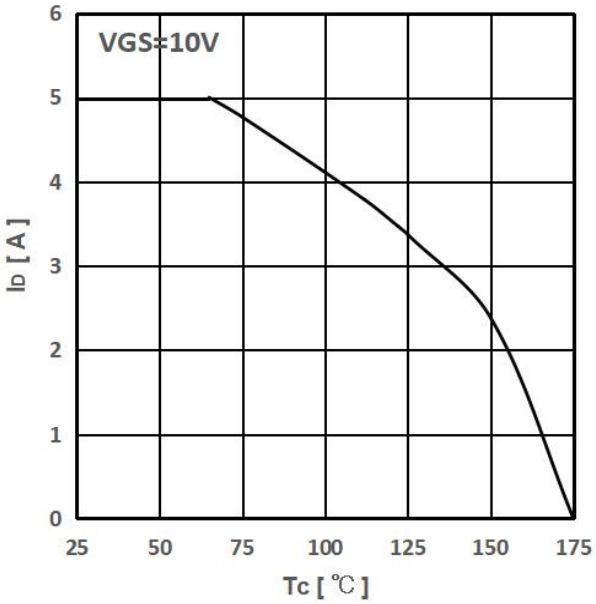
1.Pulse test; pulse width = 300 μs, duty cycle ≤ 2 %.

N-Channel Typical Characteristics

PD -- Tc



ID -- Tc



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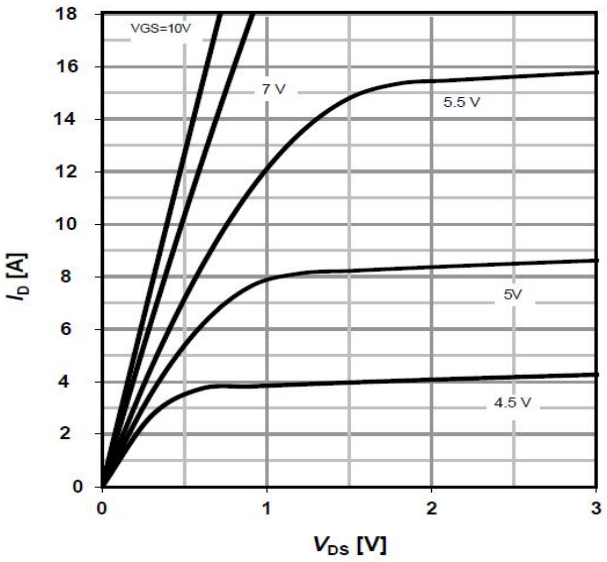
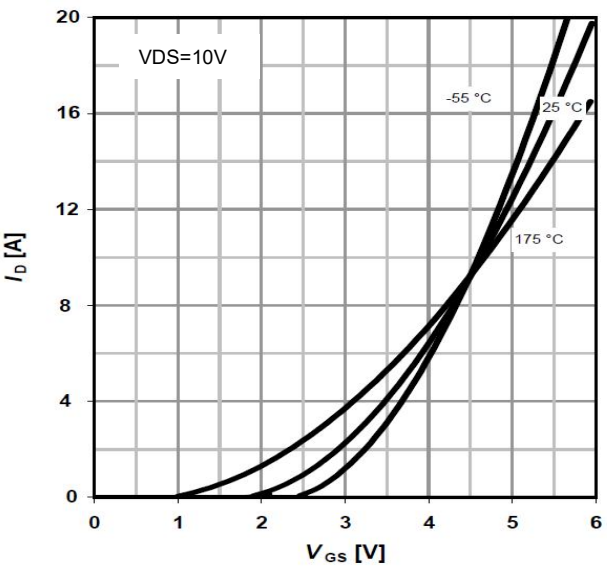
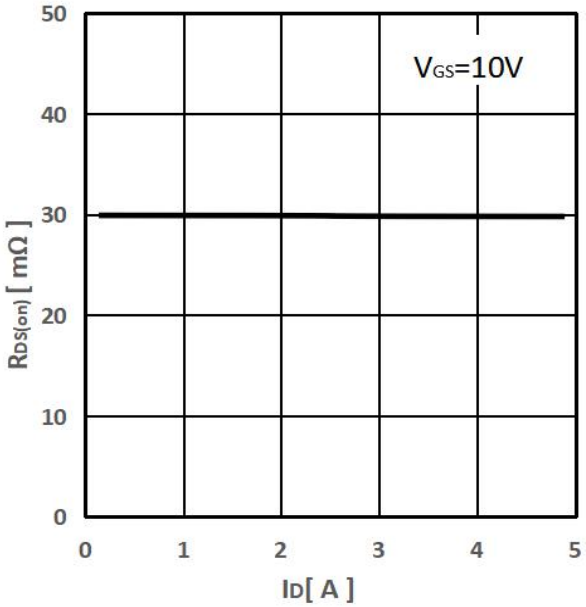


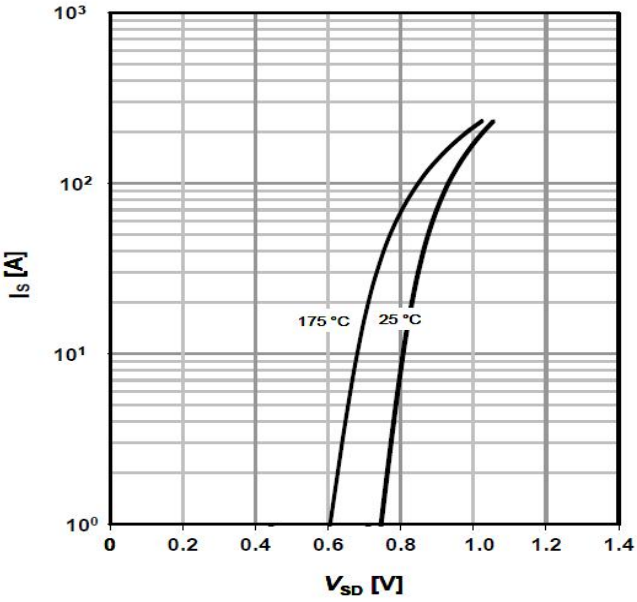
ID -- VGS



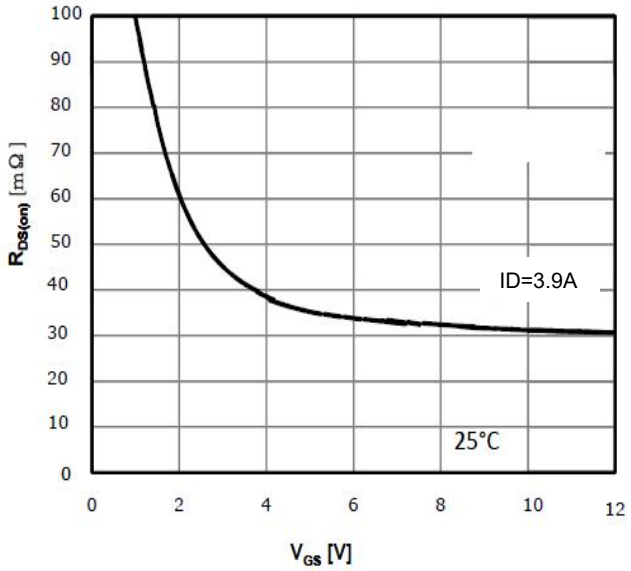
RDS(on) -- ID



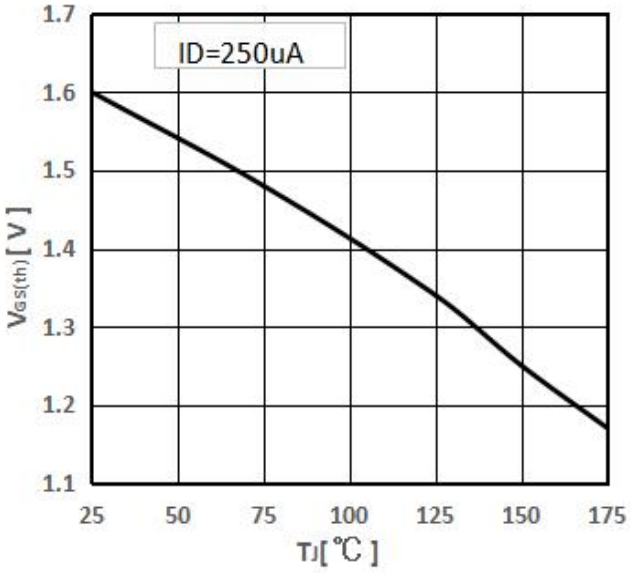
Is -- VSD



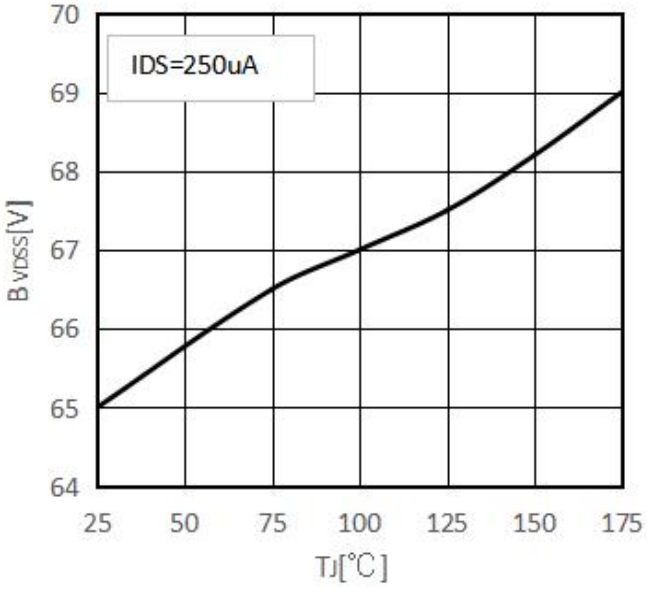
RDS(on) -- VGS



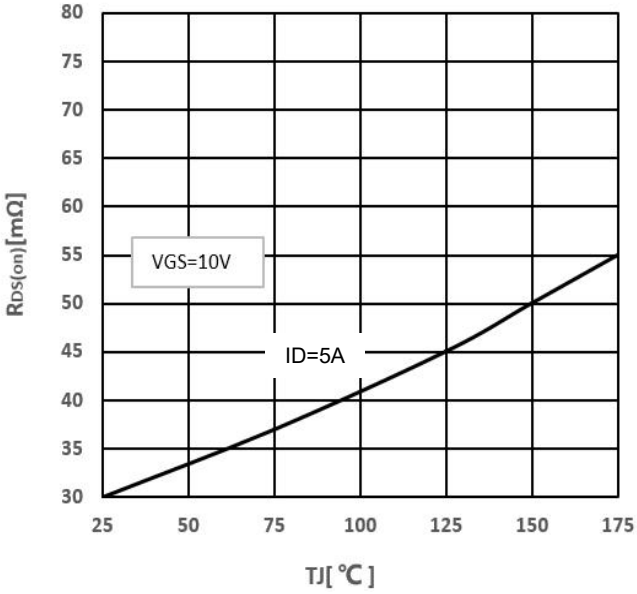
Threshold Voltage



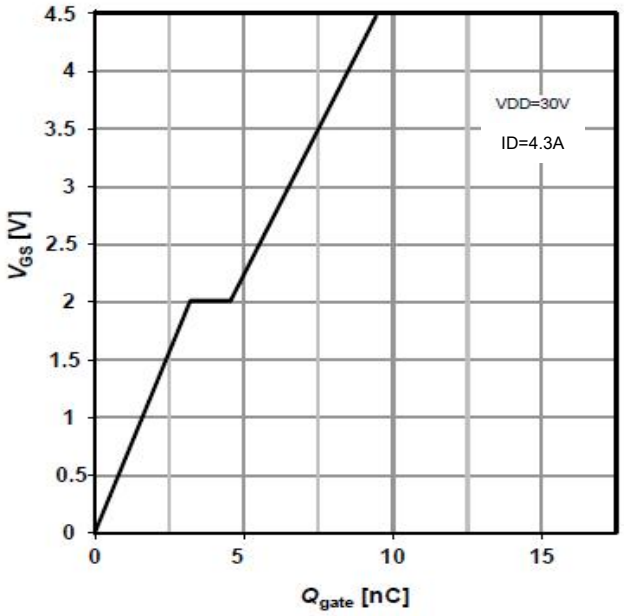
Drain-source breakdown voltage



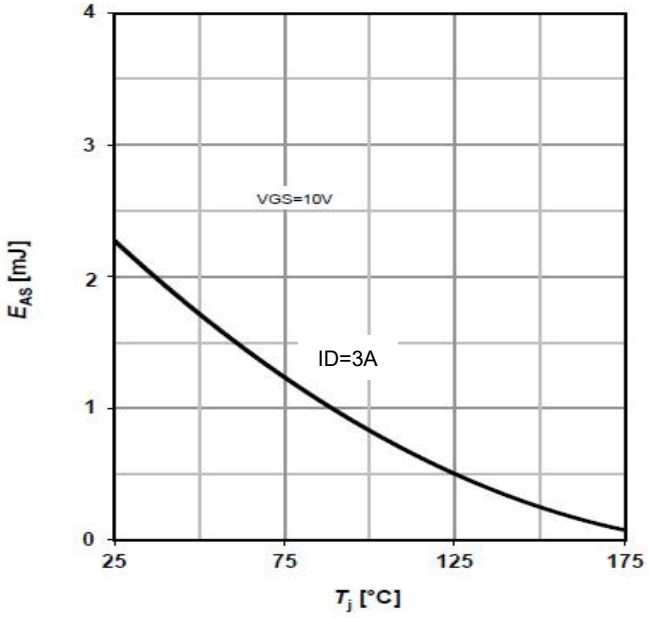
RDS（on） -- Tj



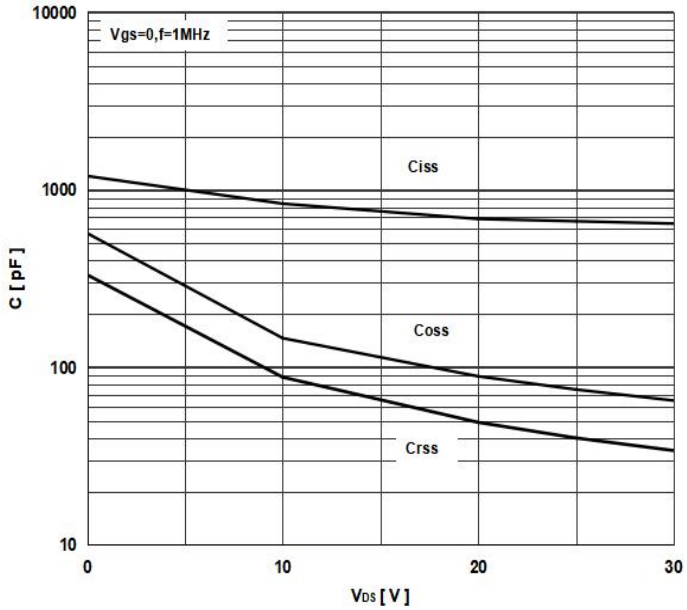
Typ.gate charge



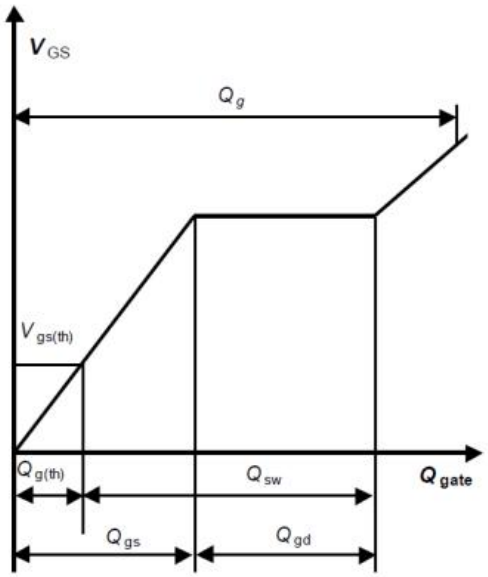
Avalanche energy



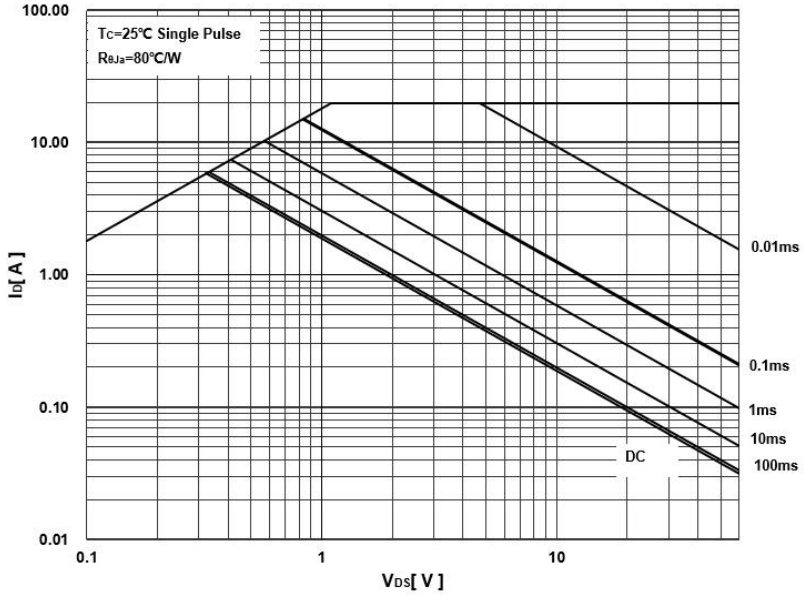
Typ.capacitance



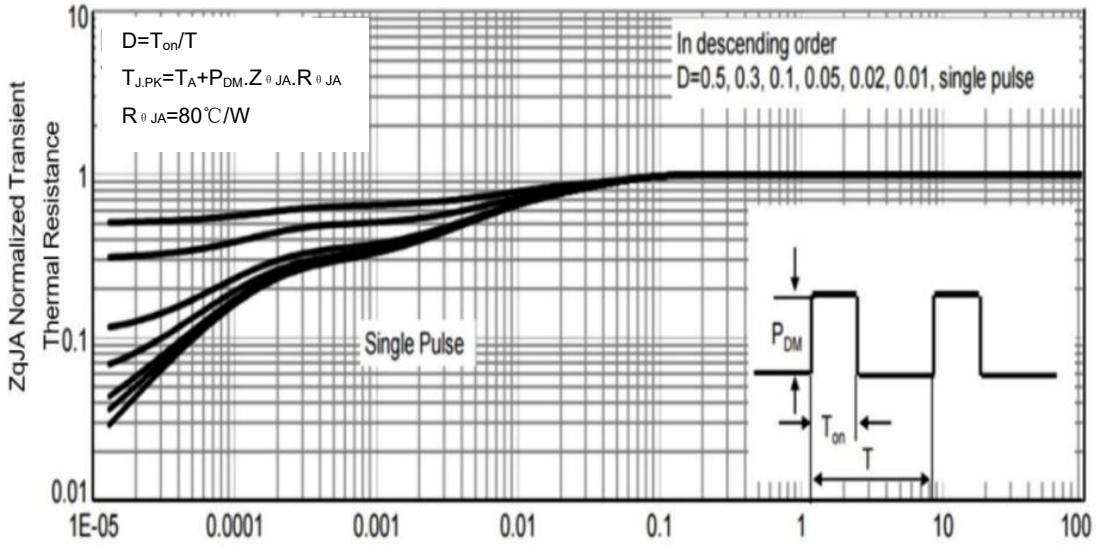
Gate charge waveforms



Maximum Forward Biased Safe Operating Area

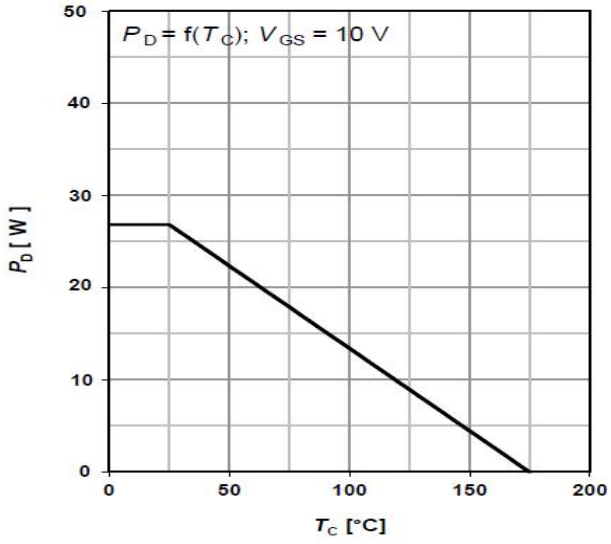


Normalized Thermal Transient Impedance

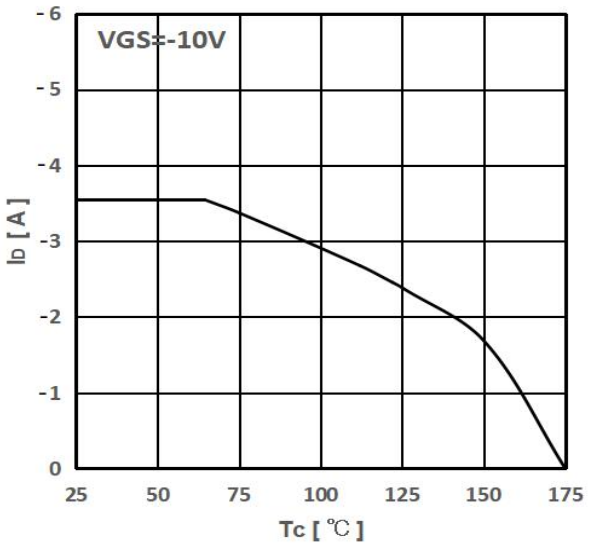


P-Channel Typical Characteristics

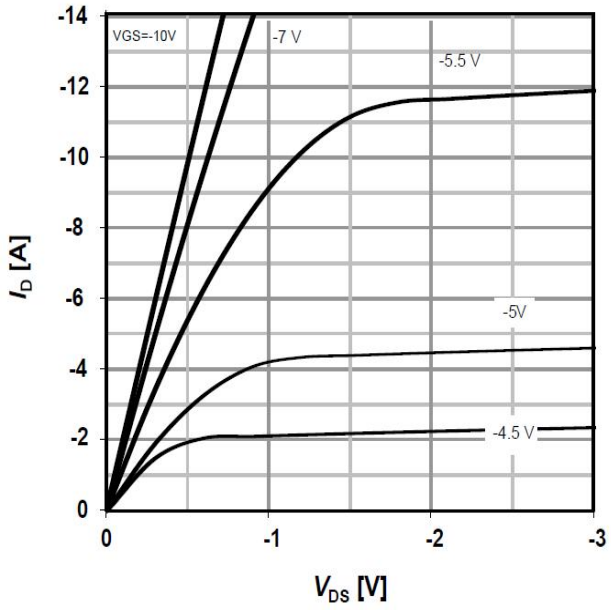
PD -- Tc



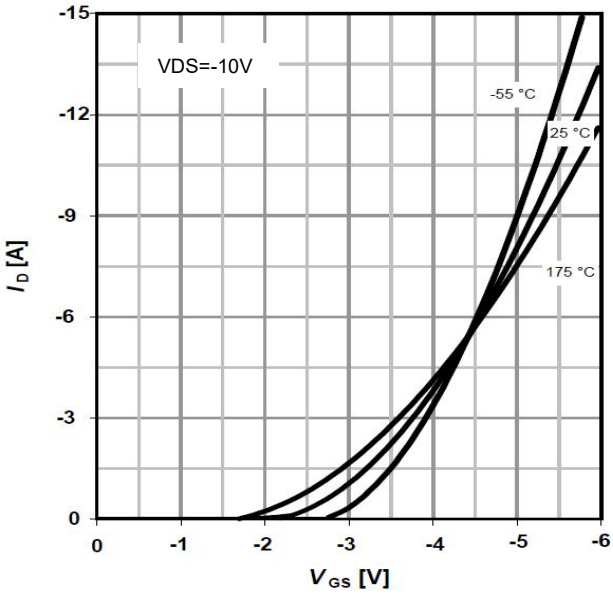
ID -- Tc



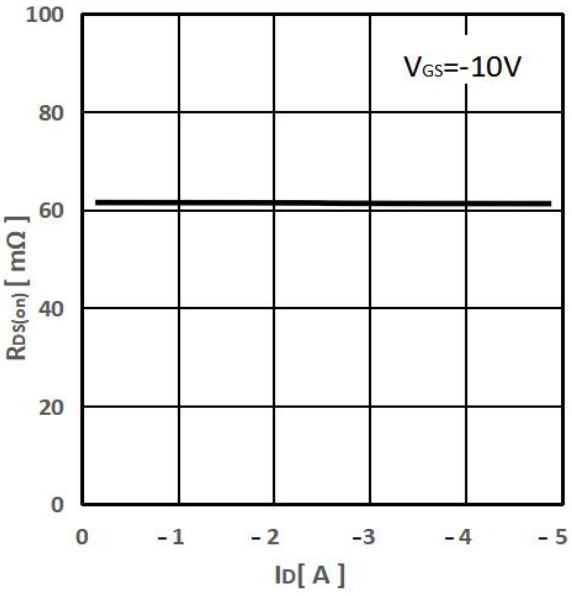
ID -- VDS



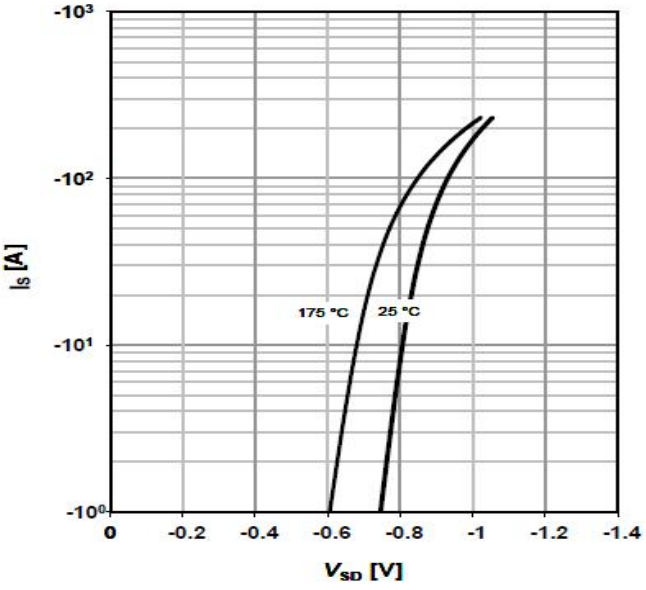
ID -- VGS



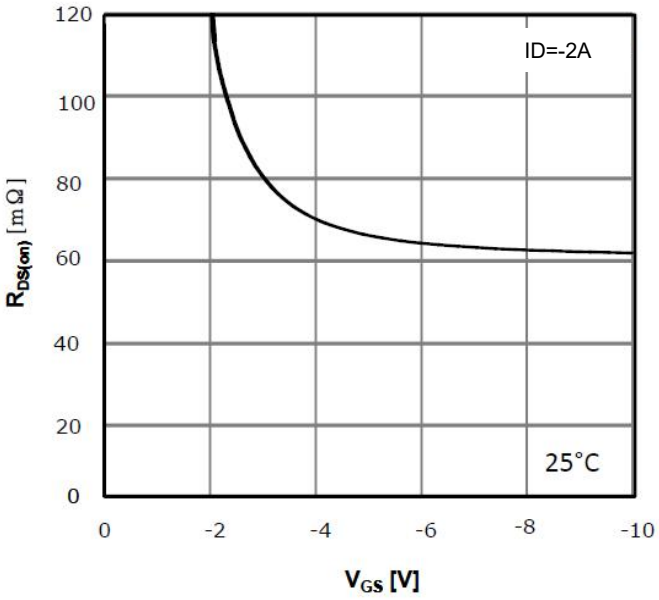
RDS(on) -- ID



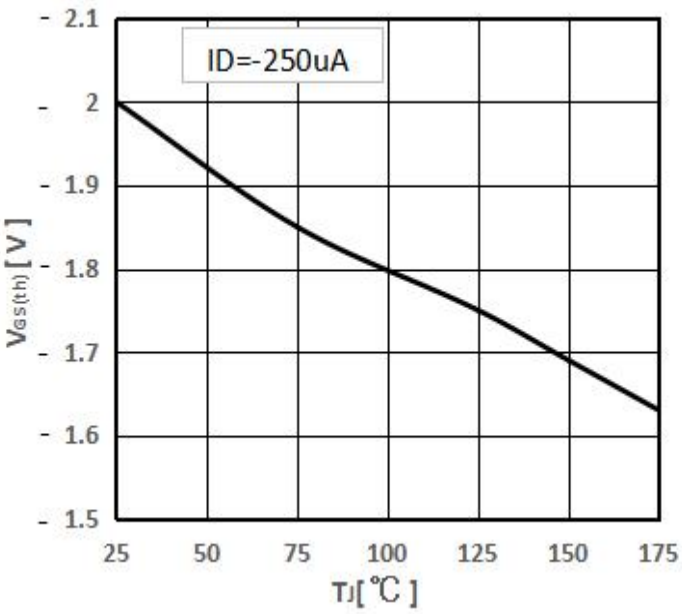
Is -- VSD



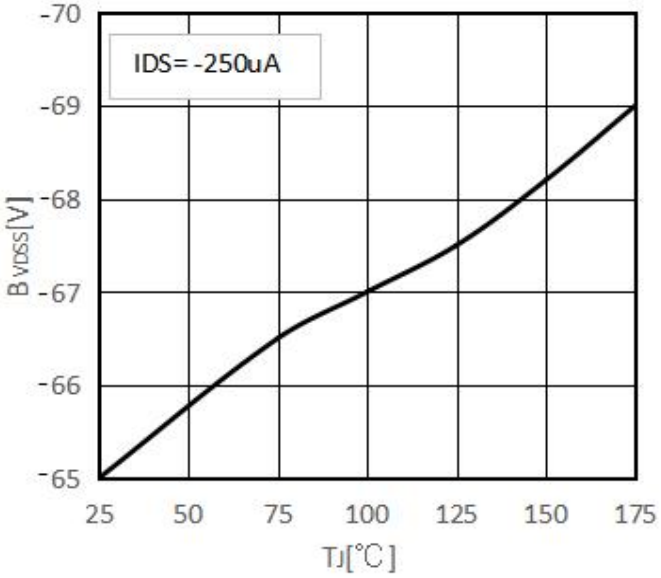
RDS(on) -- VGS



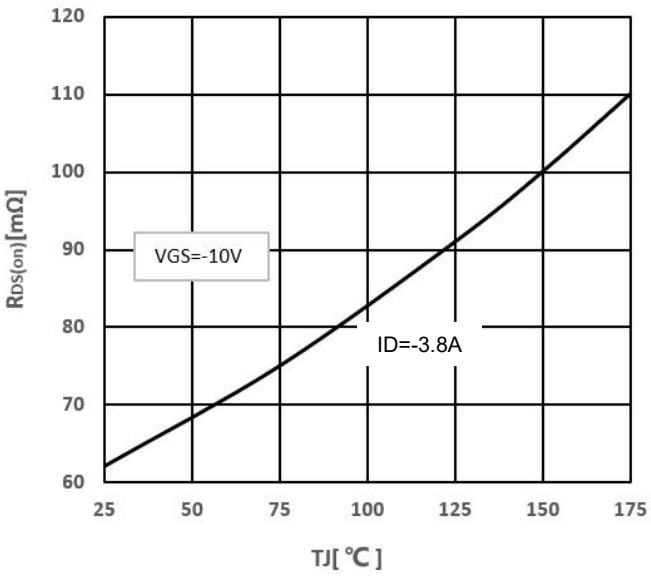
Threshold Voltage



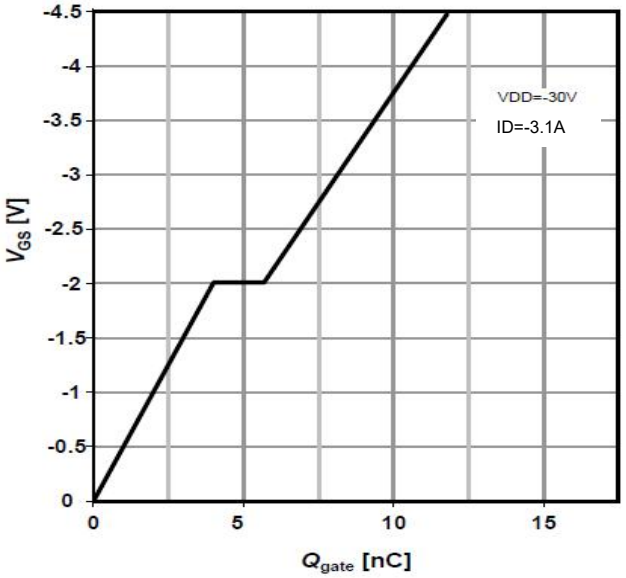
Drain-source breakdown voltage



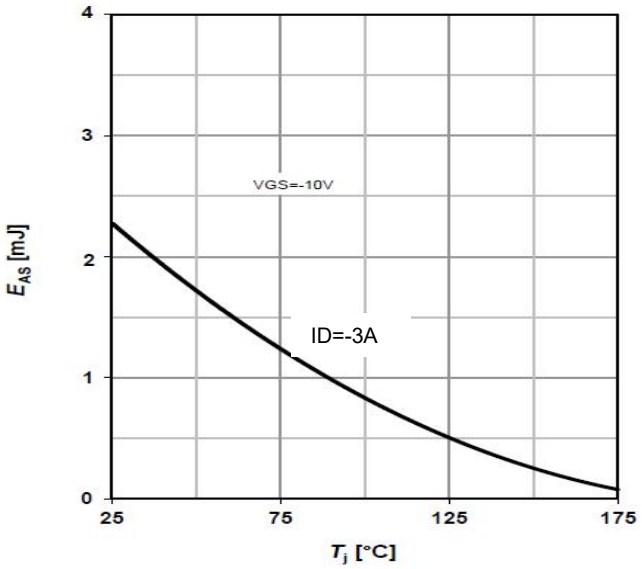
RDS（on） -- Tj



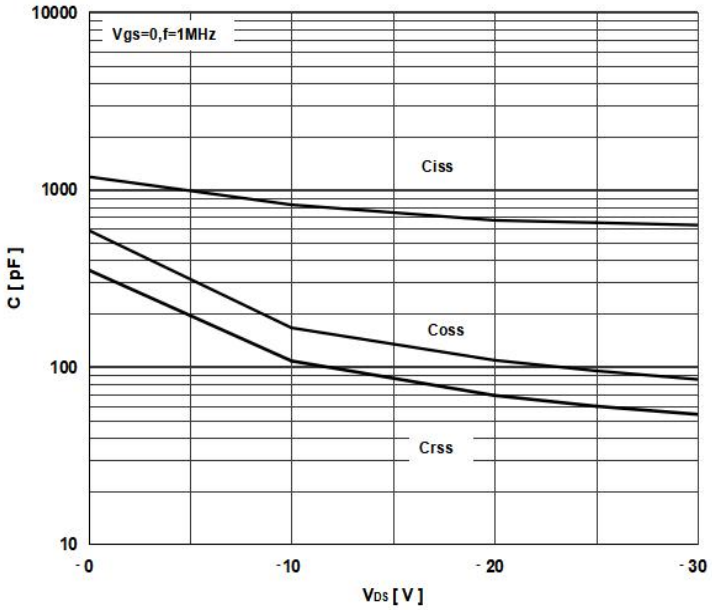
Typ.gate charge



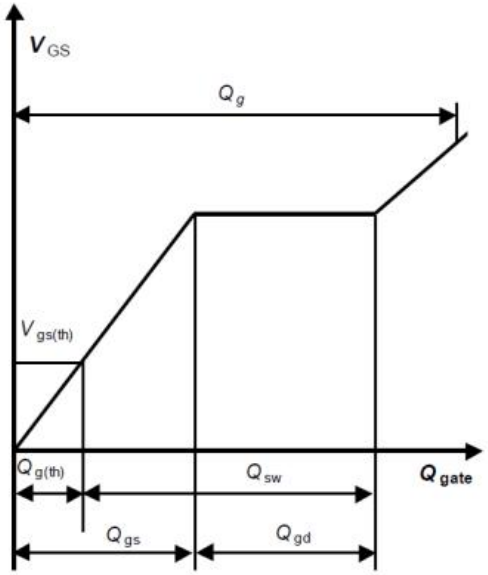
Avalanche energy



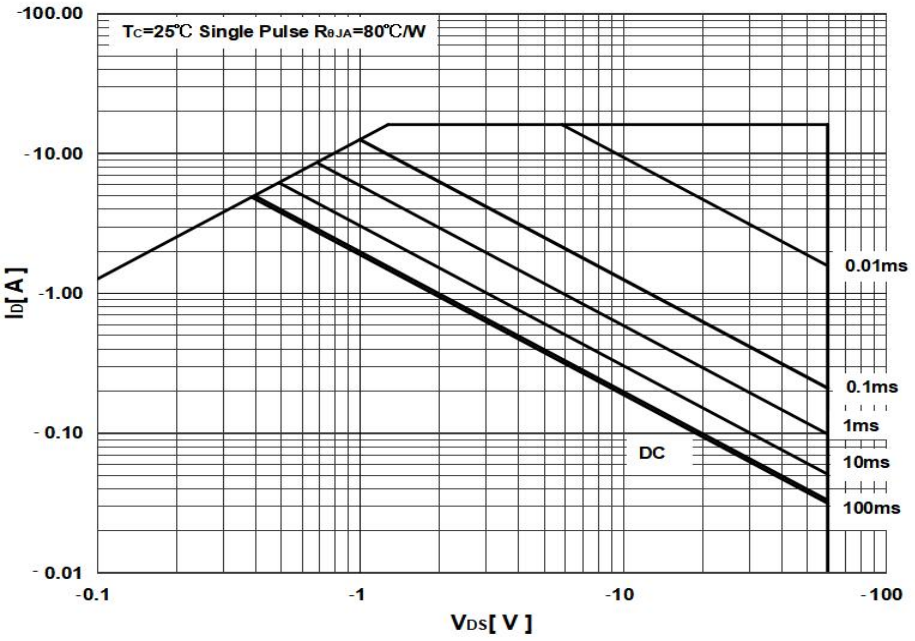
Typ.capacitance



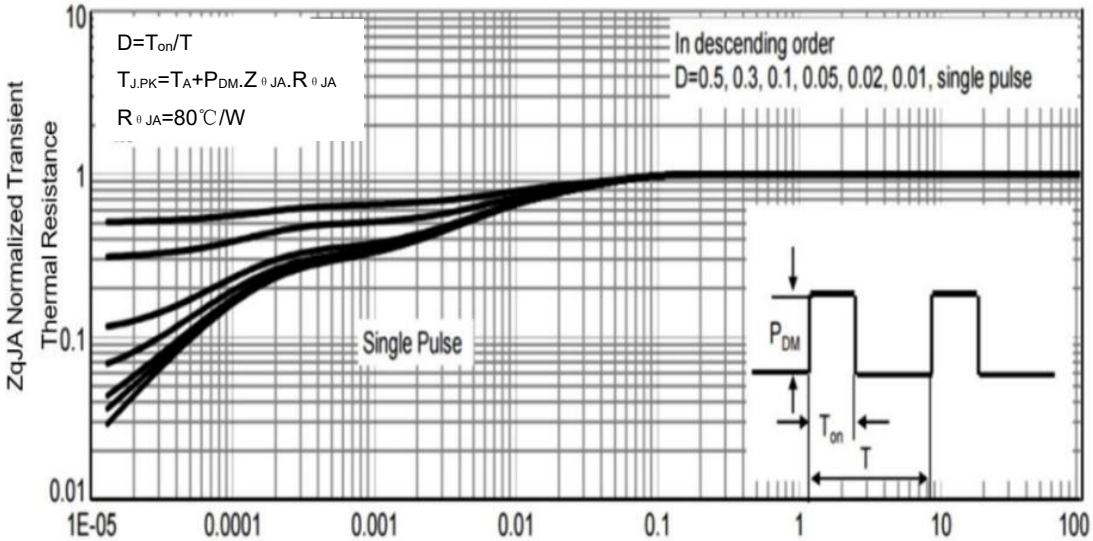
Gate charge waveforms



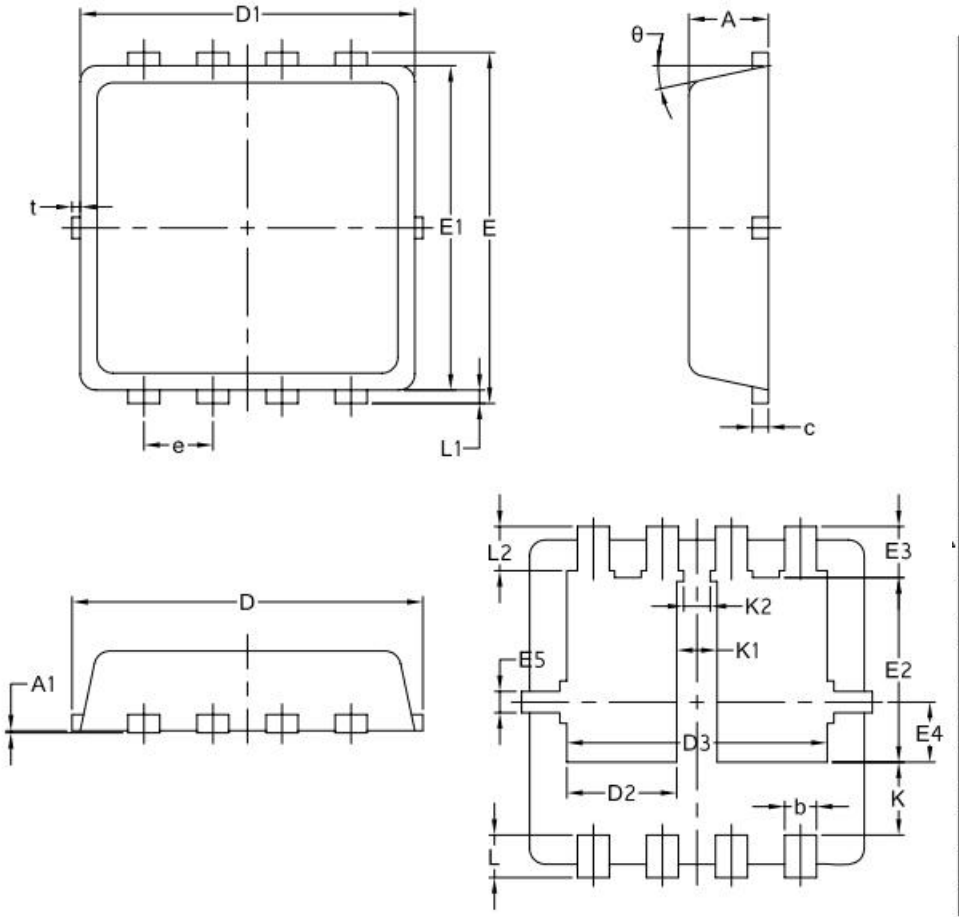
Maximum Forward Biased Safe Operating Area



Normalized Thermal Transient Impedance



PDFN3.3*3.3-8L Package Outline Dimensions



SYMBOL	COMMON		
	MM		
	MIN	NOM	MAX
A	0.70	0.75	0.85
A1	/	/	0.05
b	0.25	0.30	0.39
c	0.14	0.152	0.20
D	3.20	3.30	3.45
D1	3.05	3.15	3.25
D2	0.84	1.04	1.24
D3	2.30	2.45	2.60
E	3.20	3.30	3.40
E1	2.95	3.05	3.15
E2	1.60	1.74	1.90
E3	0.28	0.48	0.65
E4	0.37	0.57	0.77
E5	0.10	0.20	0.30
e	0.60	0.65	0.70
K	0.50	0.69	0.80
K1	0.30	0.38	0.53
K2	0.15	0.25	0.35
L	0.30	0.40	0.50
L1	0.06	0.125	0.20
L2	0.27	0.42	0.57
t	0	0.075	0.13
θ	10°	12°	14°

Date of change	Rev #	revise content
2023/11/20	A/0	/
2023/12/14	A/1	修改测试条件