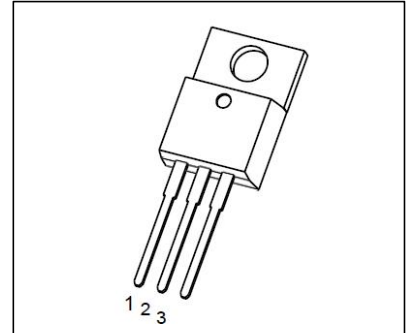




TO-220-C Plastic-Encapsulate MOSFETS

CCMB120N10S N-Channel Power MOSFET

$V_{(BR)DSS}$	$R_{DS(on)}$ TYP	I_D
100V	4.8m Ω	120A



DESCRIPTION

The CCMB120N10S uses advanced SGT technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. It can be used in a wide variety of applications.

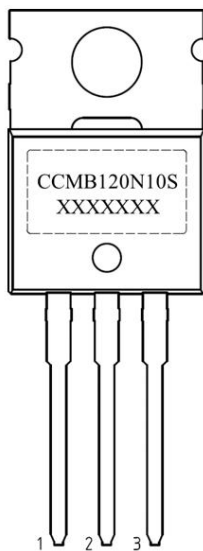
FEATURE

- Extremely low on-resistance $R_{DS(on)}$
- Excellent $Q_g \times R_{DS(on)}$ product(FOM)
- AEC Q101 qualified

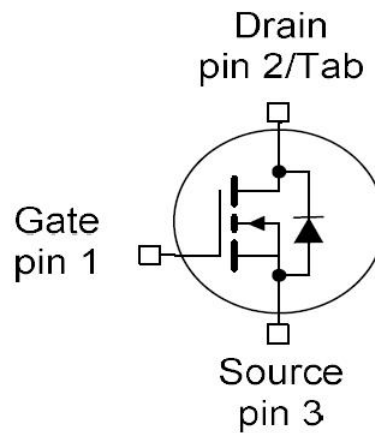
APPLICATION

- Motor control and drive
- Battery management
- UPS (Uninterruptible Power Supplies)

MARKING



EQUIVALENT CIRCUIT



ABSOLUTE MAXIMUM RATINGS(TC=25°C unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	VDS	100	V
Gate-Source Voltage	VGS	±20	V
Continuous Drain Current	ID	120	A
Pulsed Drain Current ¹	IDM	480	A
Single Pulse AvalancheEnergy ²	EAS	552	mJ
Total Power Dissipation	PD	188	W
Thermal Resistance from Junction to Case	R _{θJC}	0.79	°C/W
Operating Junction and Storage Temperature Range	TJ,TSTG	-55~+175	°C
Soldering Temperature , for 10S(1.6mm from case)	-	260	°C

Notes:

1.Current is limited by package; with a Rthjc = 0.79 °C/W the chip is able to carry 141 A at 25°C.

2.EAS condition : Tj=25°C,L=0.5mH,Rg=25Ω,Ias=47A.

MOSFET ELECTRICAL CHARACTERISTICS

TC=25°C unless otherwise specified

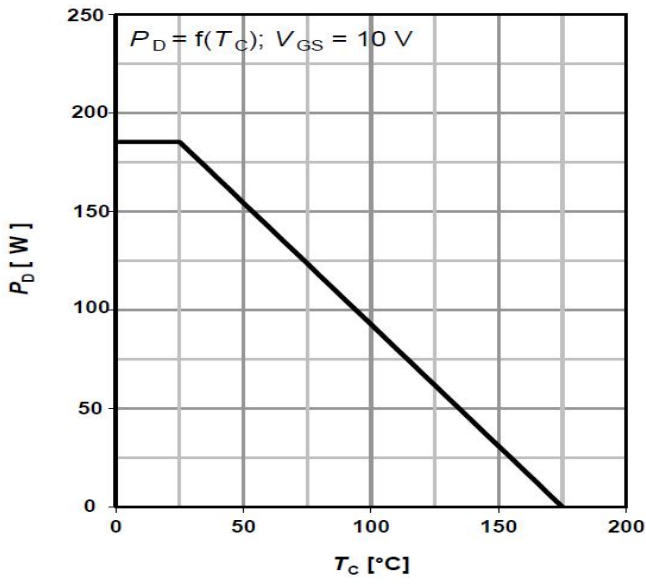
Parameter	Symbol	Test Condition	Min	Type	Max	Unit
Off characteristics						
Drain-Source breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0\text{ V}, I_D = 250\ \mu\text{A}$	100			V
Zero gate voltage drain current	I_{DSS}	$V_{DS} = 100\text{ V}, V_{GS} = 0\text{ V}$			1	μA
Gate-body leakage current	I_{GSS}	$V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$		10	100	nA
On characteristics						
Gate threshold voltage ³	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\ \mu\text{A}$	2.0	2.7	3.8	V
Drain-source on-resistance ³	$R_{DS(on)}$	$V_{GS} = 10\text{ V}, I_D = 100\text{ A}$		4.8	5.6	m Ω
Transconductance	g_{fs}	$V_{DS}=10\text{ V}, I_D=100\text{ A}$		204		S
Dynamic characteristics¹						
Input Capacitance	C_{iss}	$V_{DS} = 25\text{ V}, V_{GS} = 0\text{ V},$ $f = 1\text{ MHz}$		3735	4855	pF
Output Capacitance	C_{oss}			1553	2020	
Reverse Transfer Capacitance	C_{rss}			184	240	
Gate resistance	R_g	$V_{GS} = 0\text{ V}, V_{DS}=0\text{ V}, f=1\text{ MHz}$		2.7		Ω
Switching characteristics¹						
Total Gate Charge	Q_g	$V_{DD} = 50\text{ V}, V_{GS} = 10\text{ V},$ $I_D = 100\text{ A}, f = 1\text{ MHz}$		113		nC
Gate-Source Charge	Q_{gs}			38		
Gate-Drain Charge	Q_{gd}			23		
Turn-on delay time	$t_{d(on)}$	$V_{DD} = 50\text{ V}, V_{GS} = 10\text{ V},$ $I_D = 100\text{ A}, R_G = 3.5\ \Omega$		25		ns
Turn-on rise time	t_r			15		
Turn-off delay time	$t_{d(off)}$			53		
Turn-off fall time	t_f			18		
Drain-Source Diode Characteristics						
Drain-source diode forward Voltage ³	V_{SD}	$V_{GS} = 0\text{ V}, I_{SD} = 100\text{ A}, T_j = 25\text{ }^\circ\text{C}$			1.2	V
Continuous drain-source diode forward current ²	I_S	$T_C = 25\text{ }^\circ\text{C}$			120	A
Pulsed drain-source diode forward current	I_{SM}				480	A
Reverse recovery time	t_{rr}	$I_F=100\text{ A}, dI/dt=100\text{ A/us}$		75		ns
Reverse recovery charge	Q_{rr}				163	

Notes :

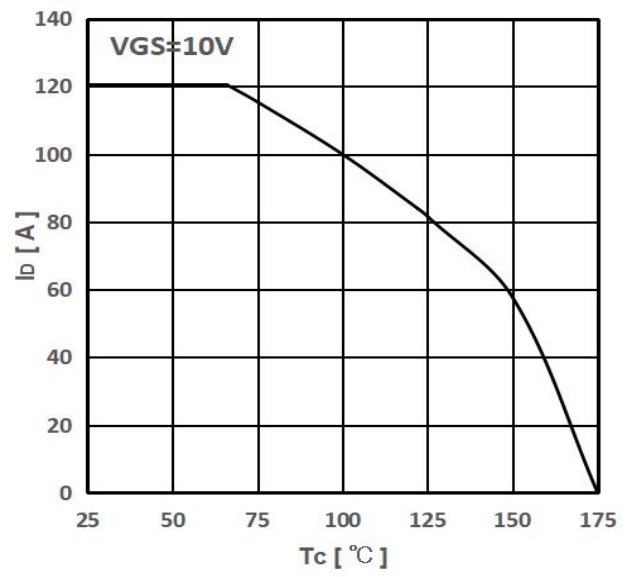
1. Guaranteed by design, not subject to production.
2. Surface Mounted on FR4 Board, $t \leq 10\text{ sec}$.
3. Pulse Test: Pulse Width $\leq 300\ \mu\text{s}$, Duty Cycle $\leq 2\%$.

Typical Characteristics

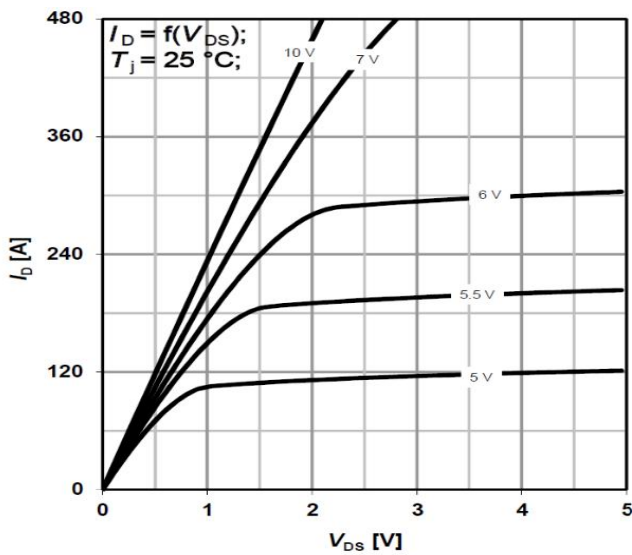
PD -- Tc



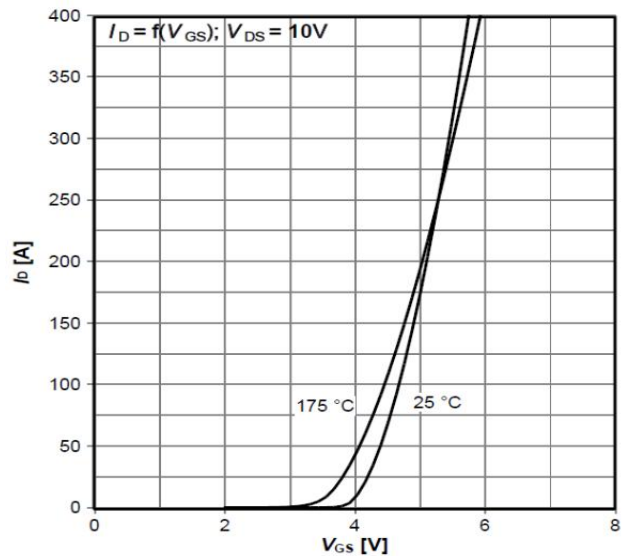
ID -- Tc



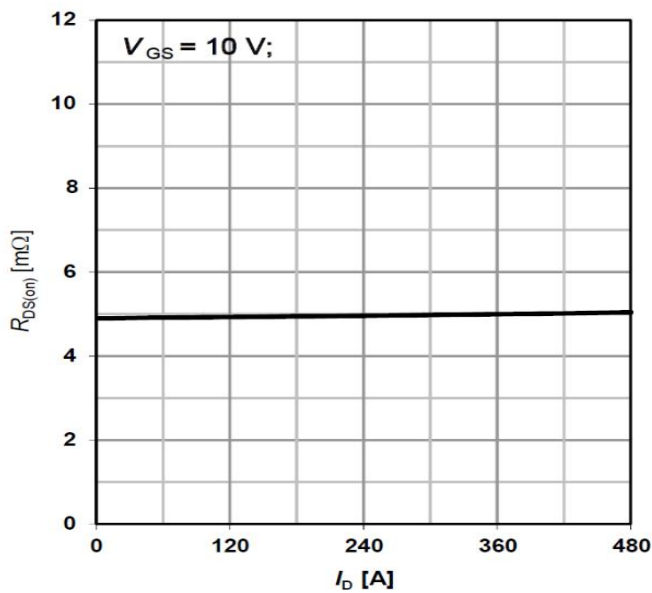
ID -- VDS



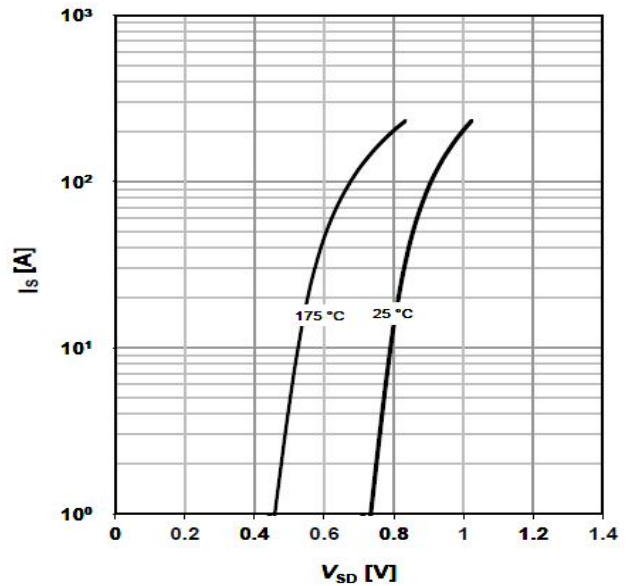
ID -- VGS



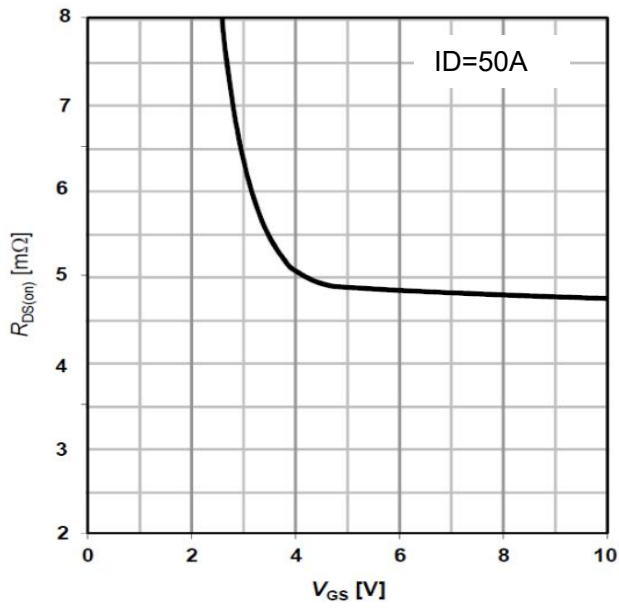
RDS(on) -- ID



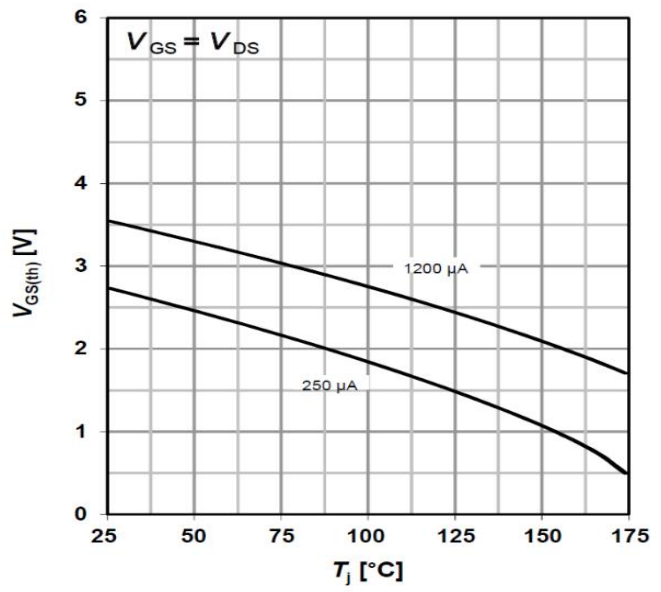
IS -- VSD



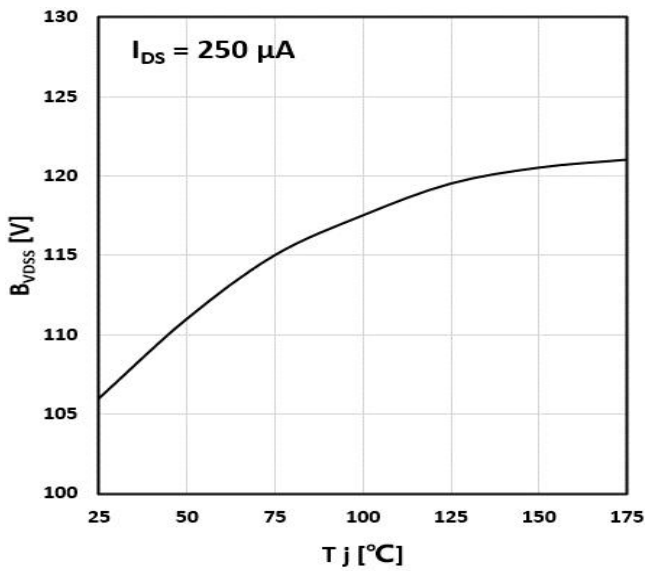
RDS(on) -- VGS



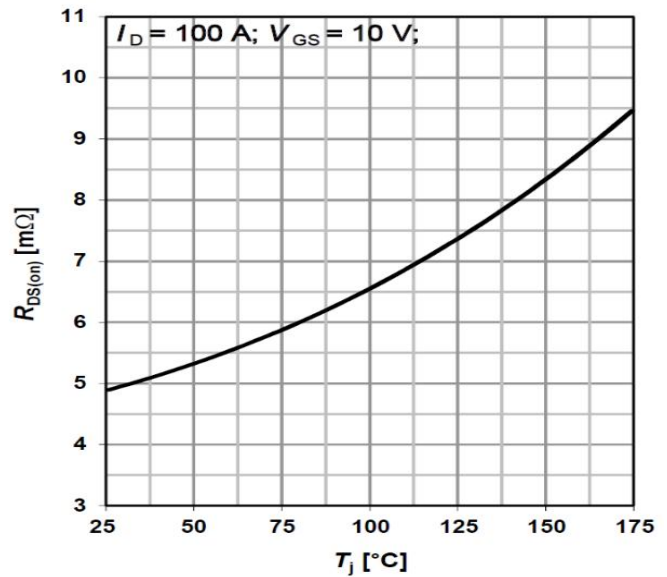
Threshold Voltage



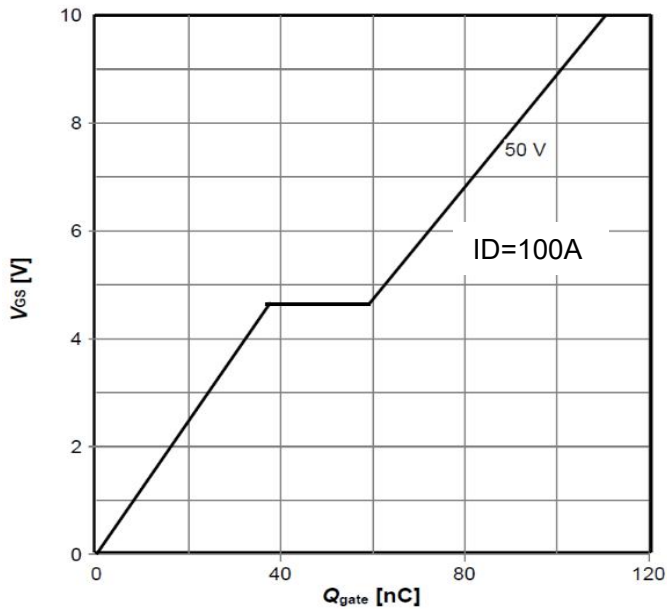
Drain-source breakdown voltage



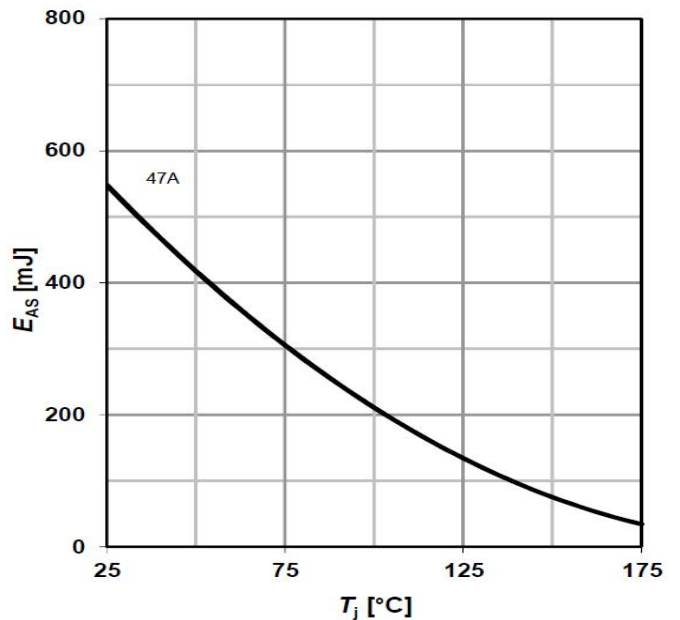
RDS (on) -- Tj



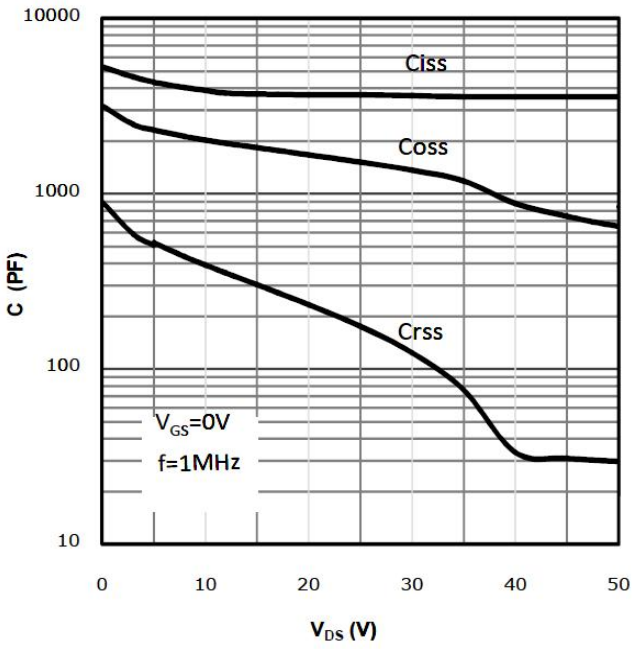
Typ.gate charge



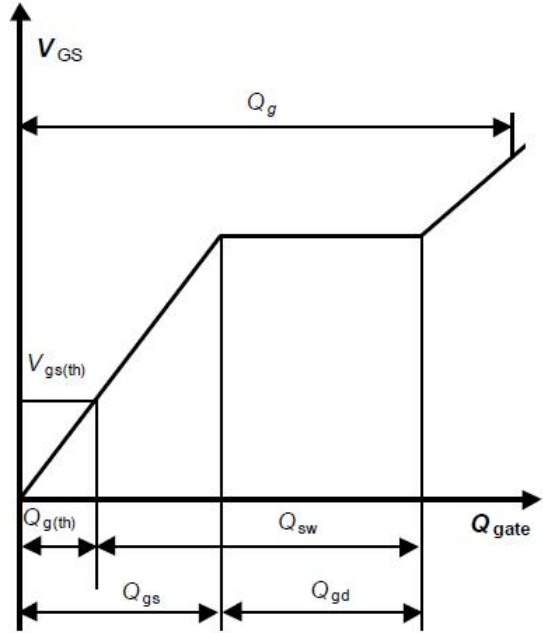
Avalanche energy



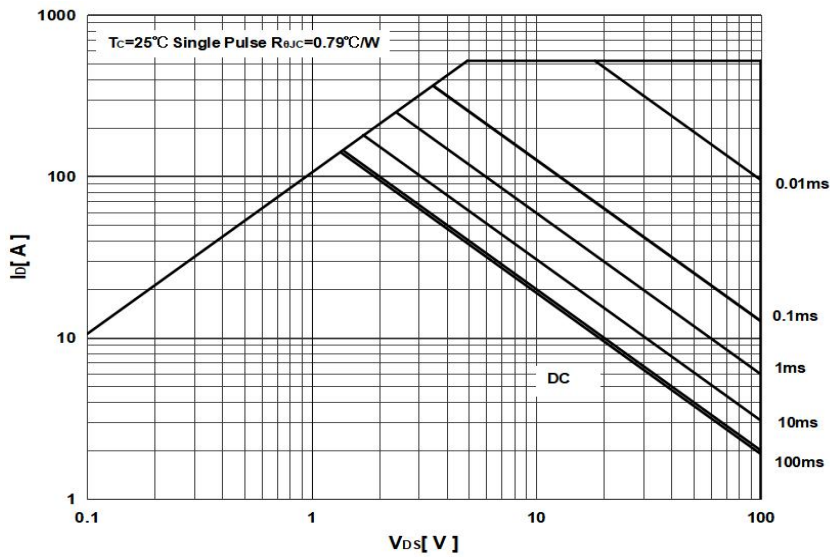
Typ. capacitance



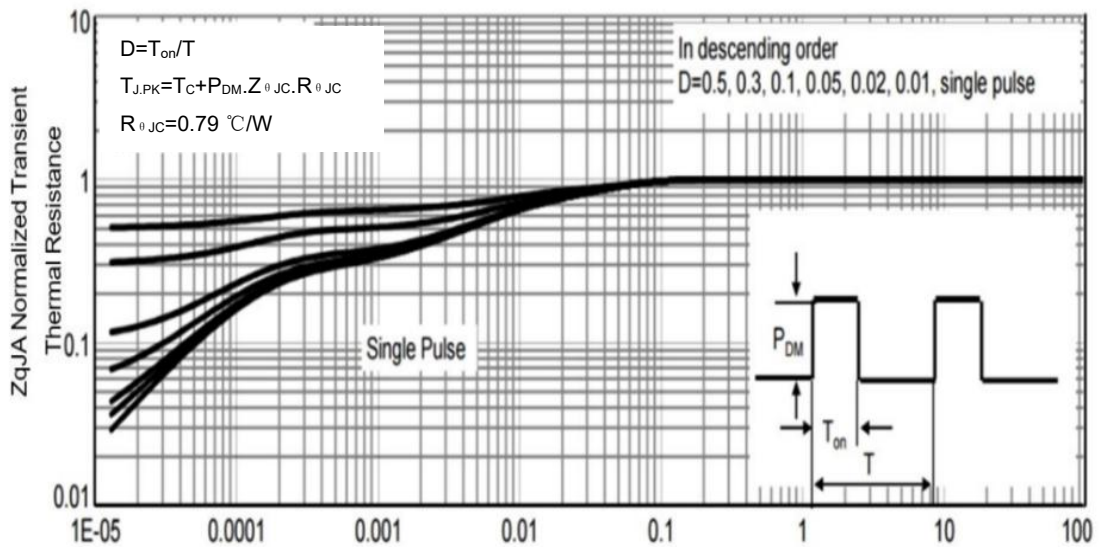
Gate charge waveforms



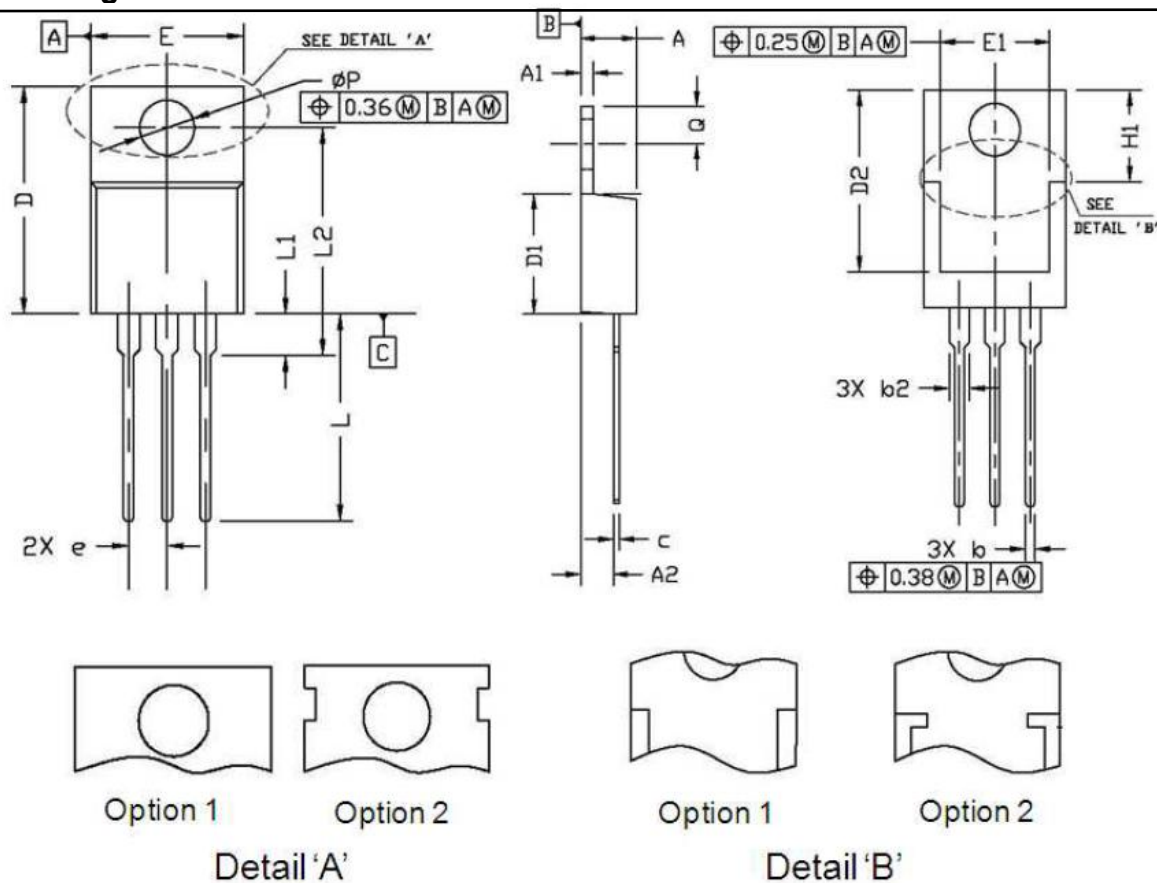
Safe operating area



Normalized Thermal Transient Impedance



TO-220-C Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.30	4.80	0.169	0.189
A1	1.20	1.45	0.047	0.057
A2	2.20	2.90	0.087	0.114
b	0.69	0.95	0.027	0.037
b2	1.00	1.60	0.039	0.063
c	0.33	0.65	0.013	0.026
D	14.70	16.20	0.579	0.638
D1	8.59	9.65	0.338	0.380
D2	11.75	13.60	0.463	0.535
e	2.54 BSC.		0.100 BSC.	
E	9.60	10.60	0.378	0.417
E1	7.00	8.46	0.276	0.333
H1	6.20	7.00	0.244	0.276
L	12.60	14.80	0.496	0.583
L1	2.70	3.80	0.106	0.150
L2	12.13	16.50	0.478	0.650
Q	2.40	3.10	0.094	0.122
P	3.50	3.90	0.138	0.154

NOTICE

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Date of change	Rev #	revise content
2023/09/26	A/0	/
2024/01/15	A/1	增加结电容上限, 曲线标注测试电流