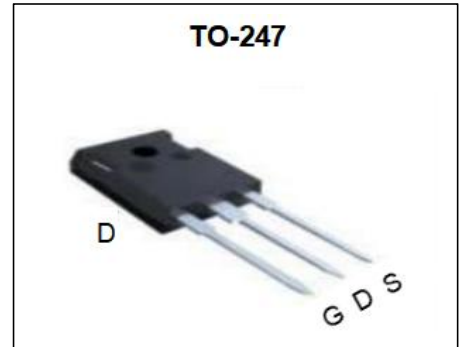




TO-247 Plastic-Encapsulate MOSFETS

CCMK180N10S N-Channel Power MOSFET

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
100 V	3.5mΩ@10V	180A



DESCRIPTION

The CCMK180N10S 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 .

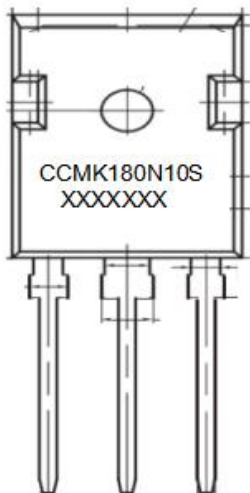
FEATURES

- Improved Gate, Avalanche and Dynamic dv/dt Ruggedness
- Fully Characterized Capacitance and Avalanche SOA
- Enhanced body diode dV/dt and dI/dt Capability
- AEC-Q101 Qualified

APPLICATIONS

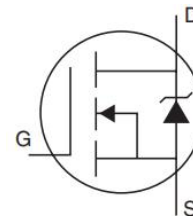
- High Efficiency Synchronous Rectification in SMPS
- Uninterruptible Power Supply
- High Speed Power Switching
- Hard Switched and High Frequency Circuits

MARKING



CCMK180N10S =Part No.
XXXXXXX = Code.

EQUIVALENT CIRCUIT



ABSOLUTE MAXIMUM RATINGS($T_c=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	± 25	V
Continuous Drain Current ¹	I_D	180	A
Pulsed Drain Current ²	I_{DM}	720	A
Single Pulse Avalanche Energy ³	EAS	194	mJ
Total Power Dissipation ¹	P_D	341	W
Thermal Resistance from Junction to Case ¹	$R_{\theta JC}$	0.44	$^\circ\text{C}/\text{W}$
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55~ +175	$^\circ\text{C}$
Soldering Temperature , for 10S(1.6mm from case)	-	260	$^\circ\text{C}$

Notes:

1. $T_c=25^\circ\text{C}$ Limited only by maximum temperature allowed.
2. $P_w \leq 10\mu\text{s}$, Duty cycle $\leq 1\%$.
3. EAS condition: $V_{DD}=50\text{V}, V_{GS}=10\text{V}, I_{AS}=108\text{A}, L=0.033\text{mH}, R_g=25\Omega$ Starting $T_J = 25^\circ\text{C}$.

MOSFET ELECTRICAL CHARACTERISTICS

TC=25°C unless otherwise specified

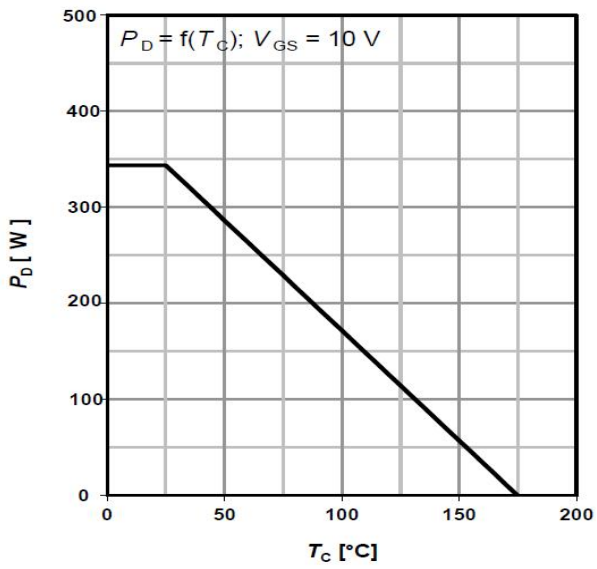
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Off characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	100			V
Zero gate voltage drain current	I_{DSS}	$V_{DS} = 100V, V_{GS} = 0V$			1	μA
Gate-body leakage current	I_{GSS}	$V_{DS} = 0V, V_{GS} = \pm 20V$			± 100	nA
On characteristics⁴						
Gate-threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	2.3	3.0	4.3	V
Static drain-source on-state resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 20A$		3.5	4.5	m Ω
Forward transconductance	g_{fs}	$V_{DS} = 10V, I_D = 10A$		46		S
Dynamic characteristics³⁴						
Input capacitance	C_{iss}	$V_{DS} = 25V, V_{GS} = 0V,$ $f = 1MHz$		5850		pF
Output capacitance	C_{oss}			2378		
Reverse transfer capacitance	C_{rss}			146		
Gate resistance	R_g	$f = 1MHz$		0.8		Ω
Switching characteristics³⁴						
Total gate charge	Q_g	$V_{GS} = 10V, V_{DD} = 50V,$ $I_D = 75A$		150	210	nC
Gate-source charge	Q_{gs}			35		
Gate-drain charge	Q_{gd}			43		
Turn-on delay time	$t_{d(on)}$	$V_{DD} = 65V, I_D = 75A,$ $V_{GS} = 10V, R_G = 2.6\Omega$		25		ns
Turn-on rise time	t_r			67		
Turn-off delay time	$t_{d(off)}$			78		
Turn-off fall time	t_f			88		
Drain-Source Diode Characteristics						
Drain-source diode forward voltage ⁴	V_{SD}	$V_{GS} = 0V, I_S = 75A$			1.3	V
Continuous drain-source diode forward Current ¹	I_S	-			180	A
Pulsed drain-source diode forward current ²	I_{SM}	-			720	A
Reverse recovery time	T_{rr}	$I_F = 10A, di/dt = 100A/\mu s,$ $V_{GS} = 0V$		85		ns
Reverse recovery charge	Q_{rr}			160		nC

Note :

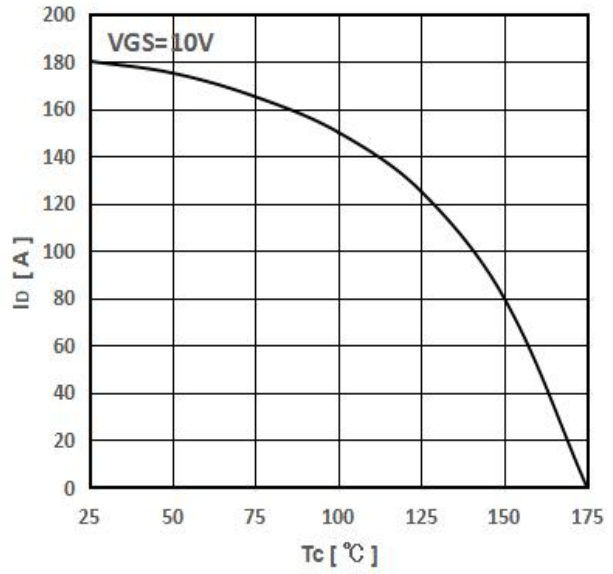
1. $T_C = 25^\circ C$ Limited only by maximum temperature allowed.
2. $P_w \leq 10\mu s$, Duty cycle $\leq 1\%$.
3. Guaranteed by design, not subject to production.
4. Pulse Test : Pulse Width $\leq 300\mu s$, duty cycle $\leq 2\%$.

Typical Characteristics

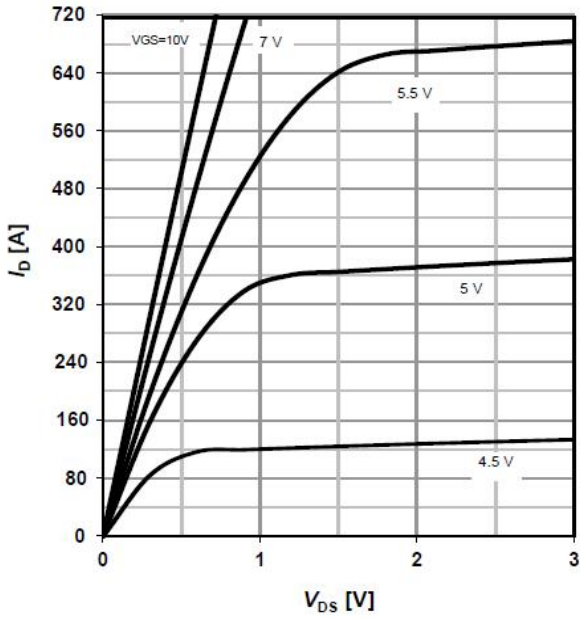
PD -- Tc



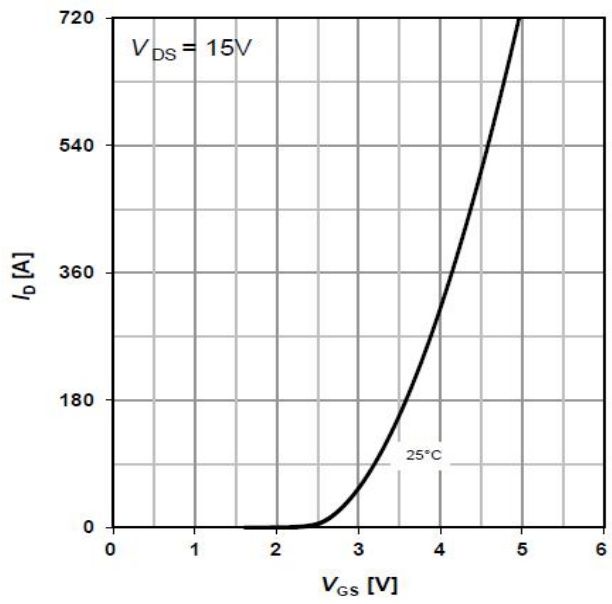
ID -- Tc



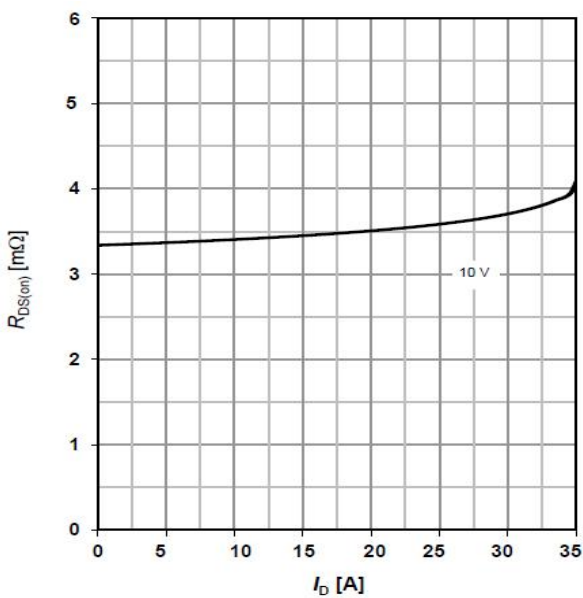
ID -- VDS



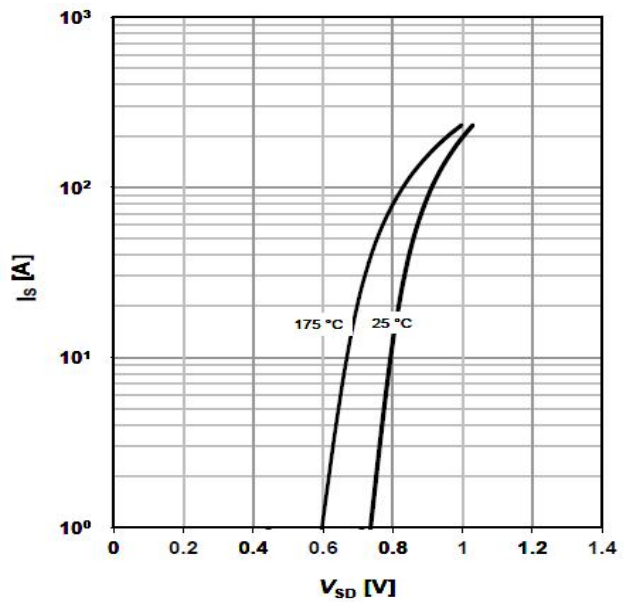
ID -- VGS



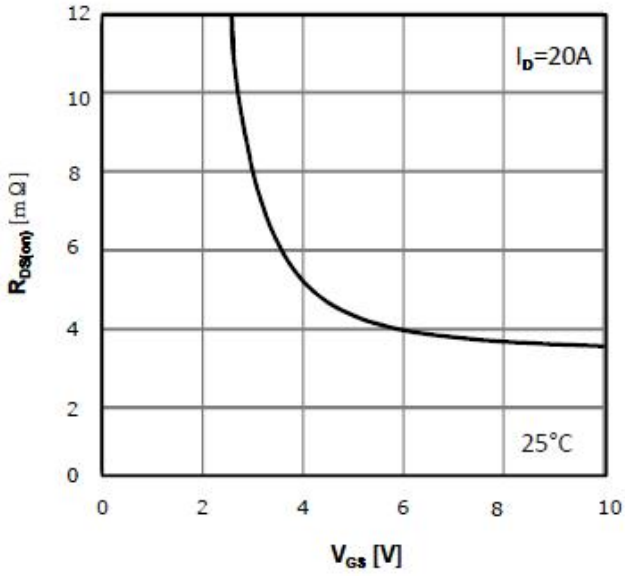
RDS(on) -- ID



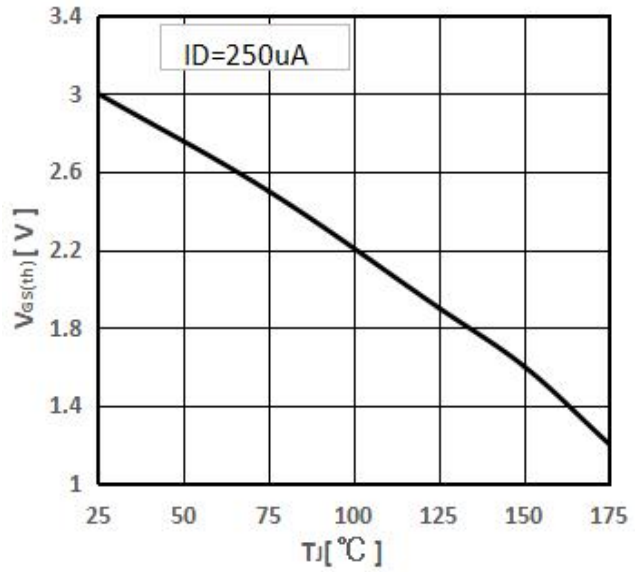
IS -- VSD



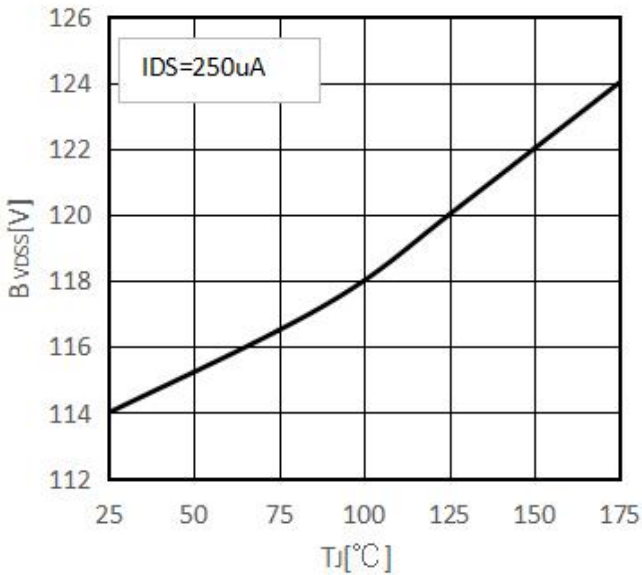
RDS(on) -- VGS



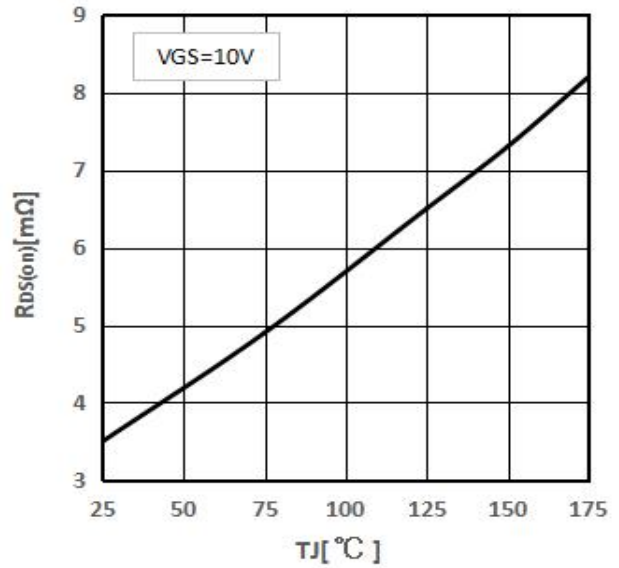
Threshold Voltage



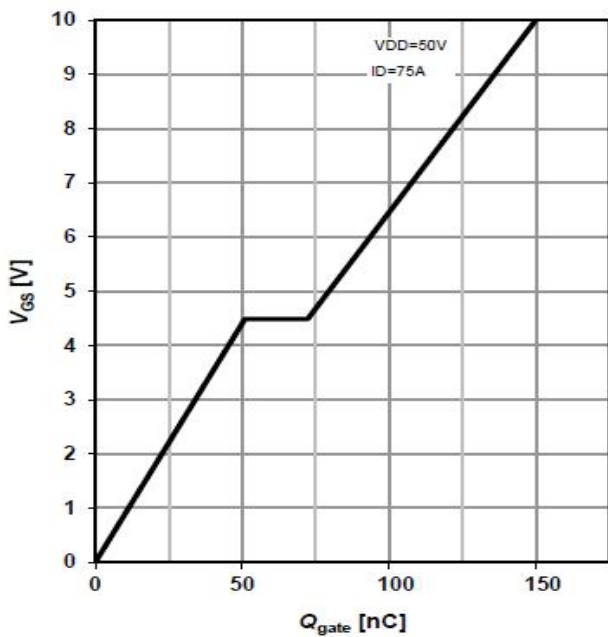
Drain-source breakdown voltage



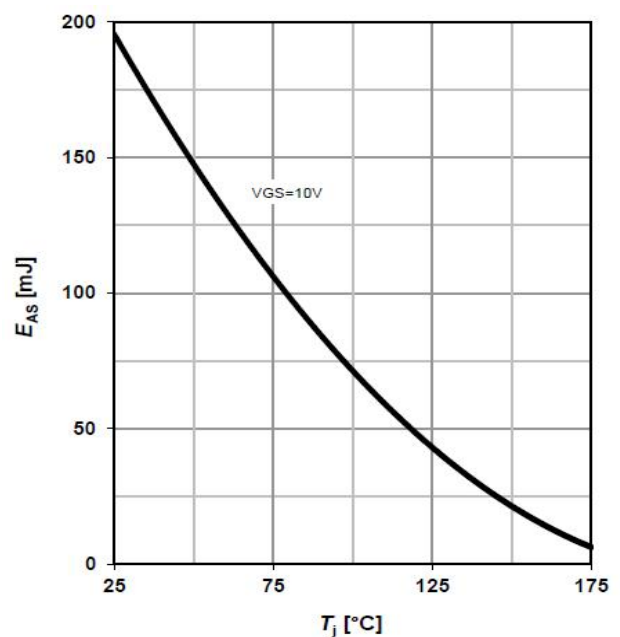
RDS (on) -- Tj



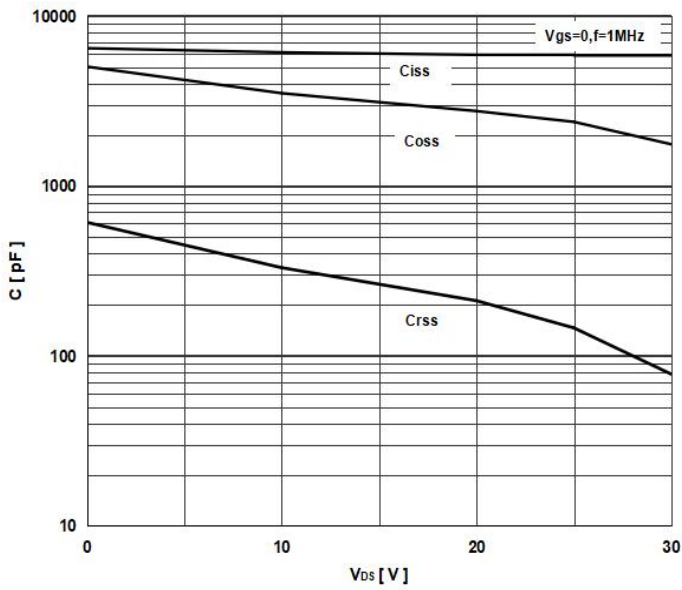
Typ.gate charge



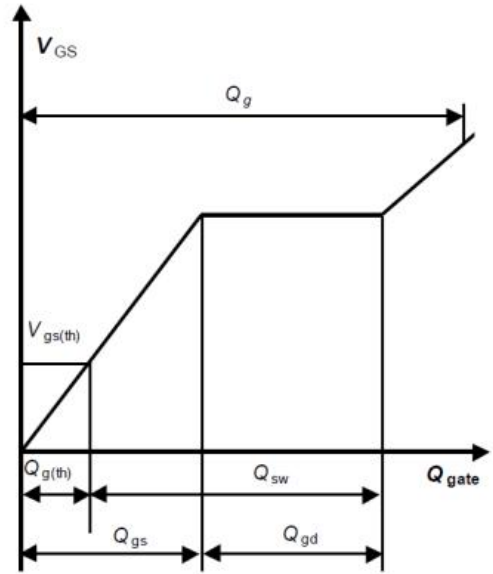
Avalanche energy



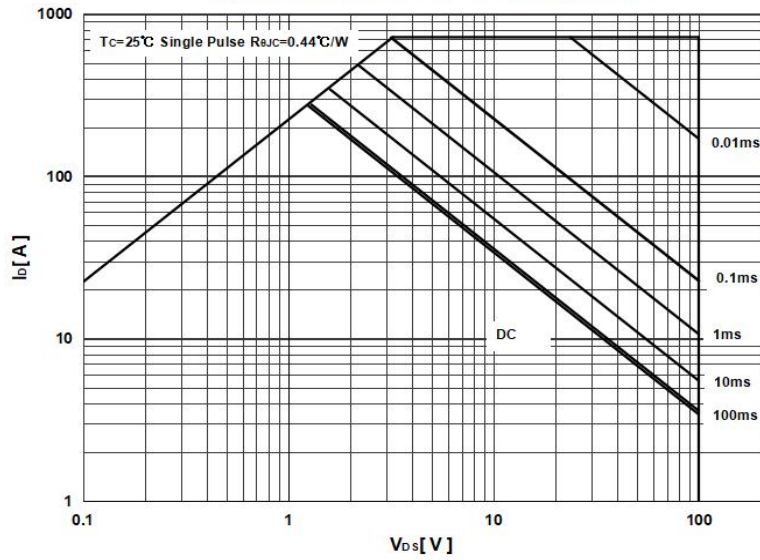
Typ. capacitance



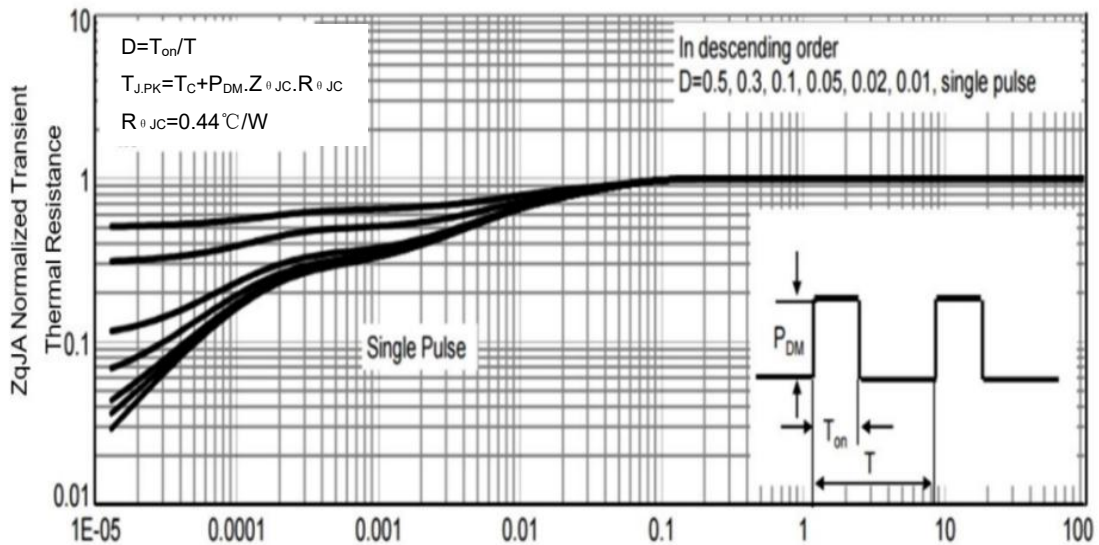
Gate charge waveforms



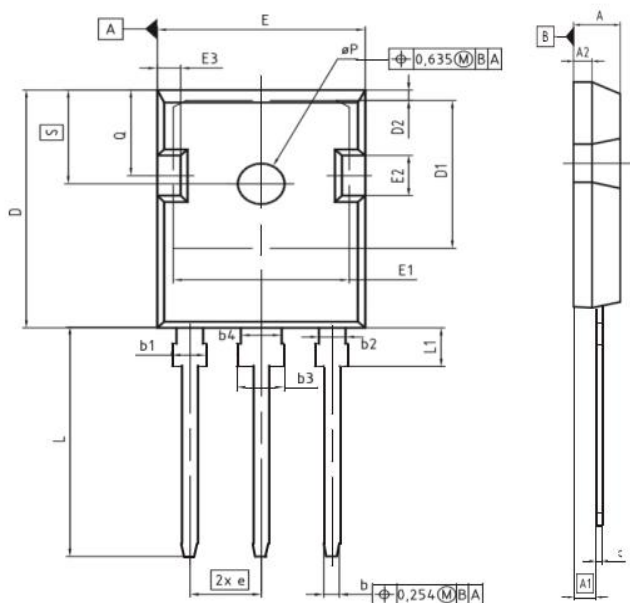
Maximum Forward Biased Safe Operating Area



Normalized Thermal Transient Impedance



TO-247 Package Outline Dimensions



DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.83	5.21	0.190	0.205
A1	2.27	2.54	0.089	0.100
A2	1.85	2.16	0.073	0.085
b	1.07	1.33	0.042	0.052
b1	1.90	2.41	0.075	0.095
b2	1.90	2.16	0.075	0.085
b3	2.87	3.38	0.113	0.133
b4	2.87	3.13	0.113	0.123
c	0.55	0.68	0.022	0.027
D	20.80	21.10	0.819	0.831
D1	16.25	17.65	0.640	0.695
D2	0.95	1.35	0.037	0.053
E	15.70	16.13	0.618	0.635
E1	13.10	14.15	0.516	0.557
E2	3.68	5.10	0.145	0.201
E3	1.00	2.60	0.039	0.102
e	5.44 (BSC)		0.214 (BSC)	
N	3		3	
L	19.80	20.32	0.780	0.800
L1	4.10	4.47	0.161	0.176
aP	3.50	3.70	0.138	0.146
Q	5.49	6.00	0.216	0.236
S	6.04	6.30	0.238	0.248

DOCUMENT NO.
Z8B00003327

SCALE
0 5 7.5mm

EUROPEAN PROJECTION

ISSUE DATE
09-07-2010

REVISION
05

TO-247 Tubing



Tubing	Box	Box Size(mm)	Carton	Carton Size(mm)
30pcs	360pcs	575*152*48	1800pcs	590*275*175

NOTICE

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Date of change	Rev #	revise content
2022/12/15	A/0	/