N-Channel Enhancement-Mode MOSFET (85V, 120A)

PRODUCT SUMMARY		
V_{DSS}	I_D	$R_{DS(on)}$ (mΩ) Max
85V	100A	5.5 @ V_{GS} = 10 V,I_D=50A

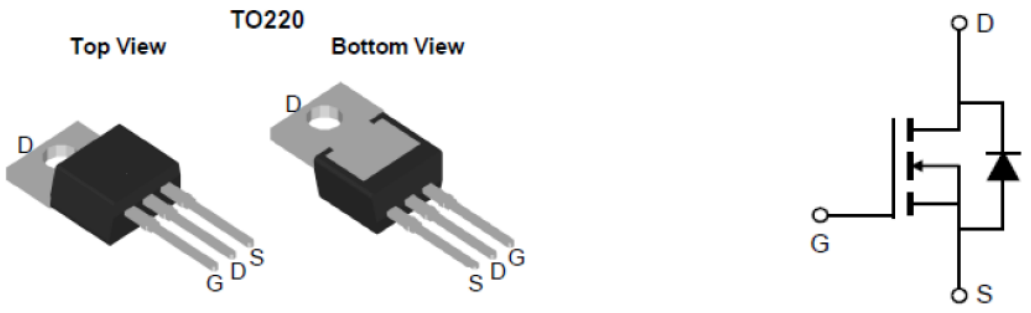
Features

- Special process technology for high ESD capability
- High density cell design for ultra low $R_{DS(on)}$
- Fully characterized avalanche voltage and current
- Good stability and uniformity with high EAS
- Excellent package for good heat dissipation
- Ordering information: GA120N08 - (Lead (Pb) - free and halogen - free)

Application

- Motor Drives
- UPS (Uninterruptible Power Supplies)
- DC/DC converter
- General purpose applications

RoHS+HF



Absolute Maximum Ratings (T_A=25℃, unless otherwise noted)

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	85	V
V_{GS}	Gate-Source Voltage	±20	V
I_D	Drain Current (Continuous)	120	A
I_{DM}	Drain Current (Pulsed)	480	A
P_D	Total Power Dissipation @T_C=25℃	180	W
T_j, T_{stg}	Operating Junction and Storage Temperature Range	-55 to +150	℃
I_{AS}	Avalanche Current with Single Pulse(L=0.5mH)	24	A
E_{AS}	Avalanche Energy with Single Pulse(L=0.5mH)	144	mJ
$R_{\theta JA}$	Thermal Resistance Junction to Ambient	62.5	℃/W

Electrical Characteristics (T_A=25℃, unless otherwise noted)

Symbol	Characteristic	Test Conditions	Min.	Typ.	Max.	Unit
• Off Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250μA	100	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=64V, V_{GS}=0V	-	-	1	μA
I_{GSS}	Gate-Body Leakage Current	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
• On Characteristics[c]						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250μA	2	-	4	V
$R_{DS(on)}$	Drain-Source On-State Resistance	V_{GS}=10V, I_D=50A	-	4.6	5.5	mΩ
R_g	Gate Resistance	V_{DS}=0V, V_{GS}=0V, f= 1MHz	-	3.3	-	Ω
g_{fs}	Forward Transconductance	V_{DS}=50V, I_D=20A	-	80	-	S
• Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}=40V, V_{GS}=0V, f=1MHz	-	3070	-	pF
C_{oss}	Output Capacitance		-	1050	-	
C_{rss}	Reverse Transfer Capacitance		-	28	-	
• Switching Characteristics						
Q_g	Total Gate Charge	V_{DS}=40V, I_D=50A, V_{GS}=10V	-	55	-	nC
Q_{gs}	Gate-Source Charge		-	15	-	
Q_{gd}	Gate-Drain Charge		-	13	-	
$t_{d(on)}$	Turn-on Delay Time	V_{DS}=40V, R_L=3Ω, I_D=20A, V_{GS}=10V, R_G=10Ω	-	20	-	nS
t_r	Turn-on Rise Time		-	38	-	
$t_{d(off)}$	Turn-off Delay Time		-	45	-	
t_f	Turn-off Fall Time		-	23	-	
• Drain-Source Diode Characteristics						
V_{SD}	Drain-Source Diode Forward Voltage	V_{GS}=0V, I_{SD}=50A	-	-	1.4	V

Note:
c: Guaranteed by design , not subject to production testing .

Typical Performance Characteristics

Figure.1: Output Characteristics

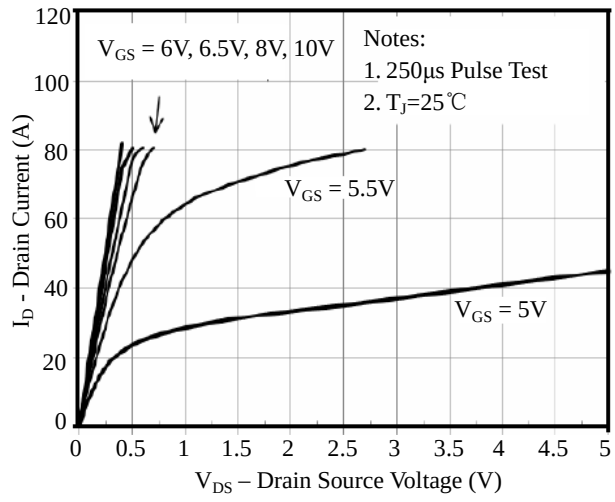


Figure.2: Transfer Characteristics

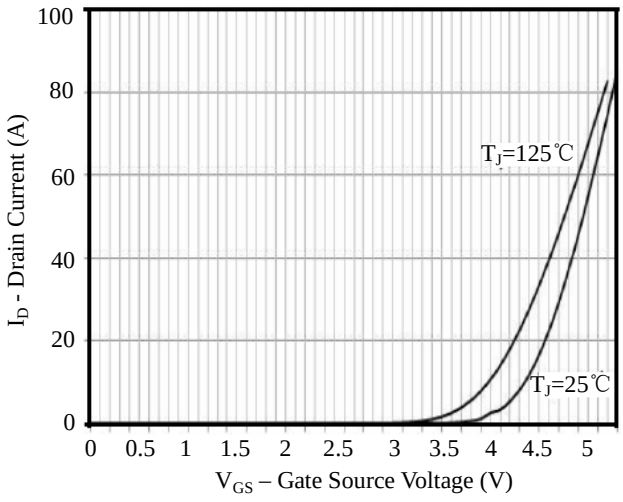


Figure.3: On-Resistance vs. Drain Current and Gate Voltage

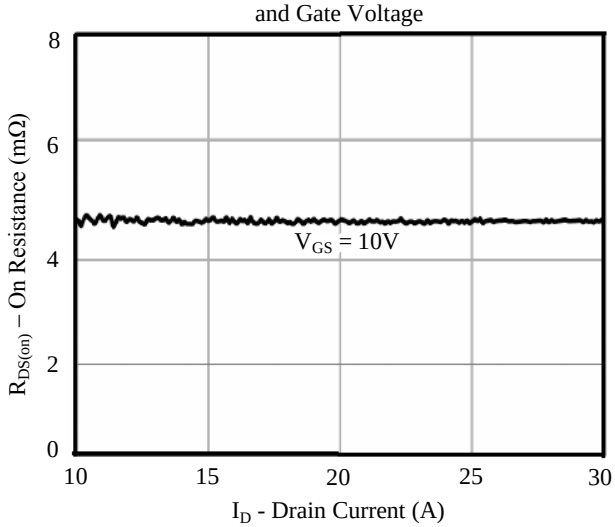


Figure.4: On-Resistance vs. Junction Temperature

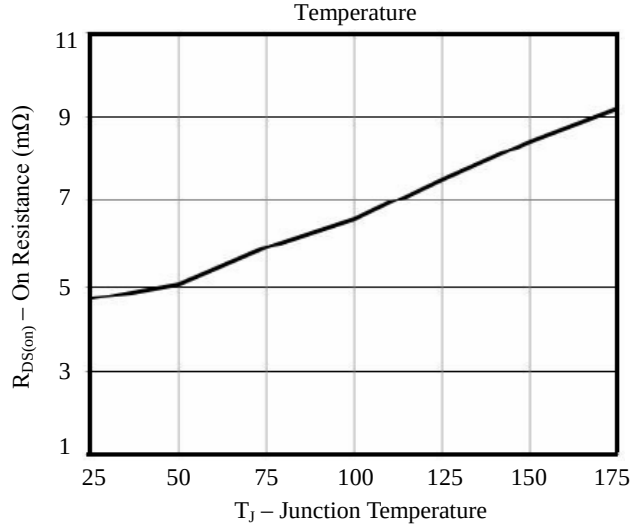


Figure.5: On-Resistance vs. Gate Source Voltage (Junction Temperature)

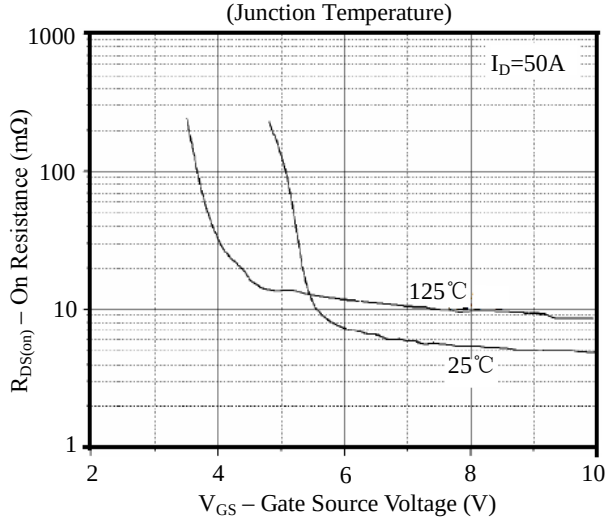
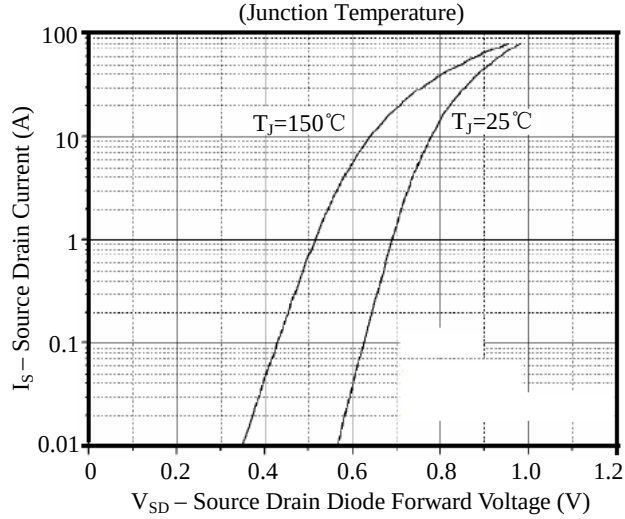


Figure.6: Body Diode Characteristics (Junction Temperature)



Typical Performance Characteristics

Figure.7 Gate Charge Characteristic

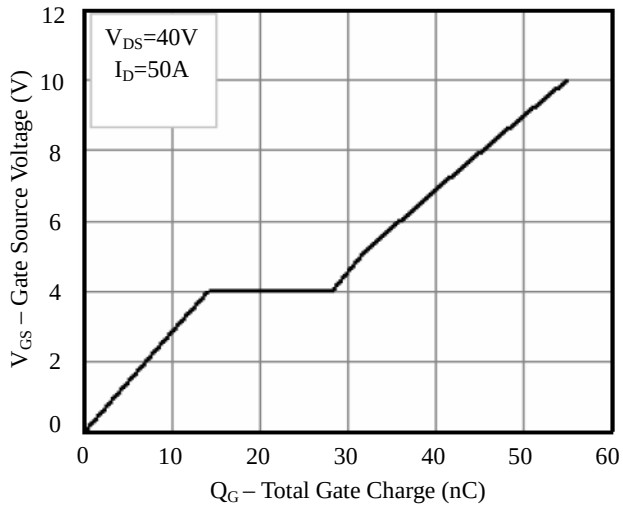


Figure.8 Capacitance Characteristic

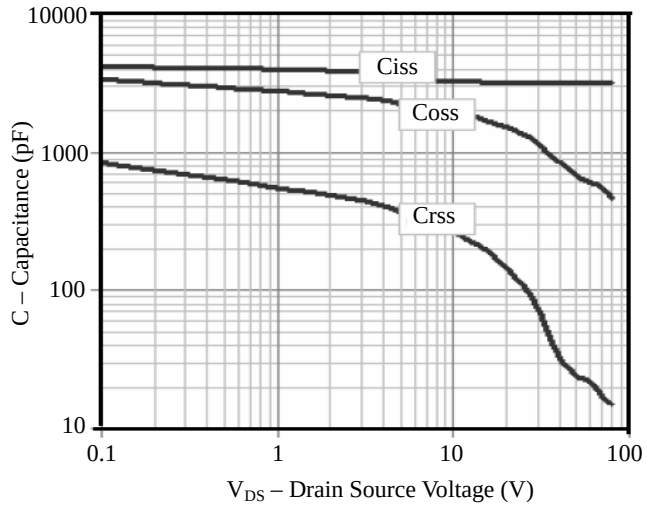
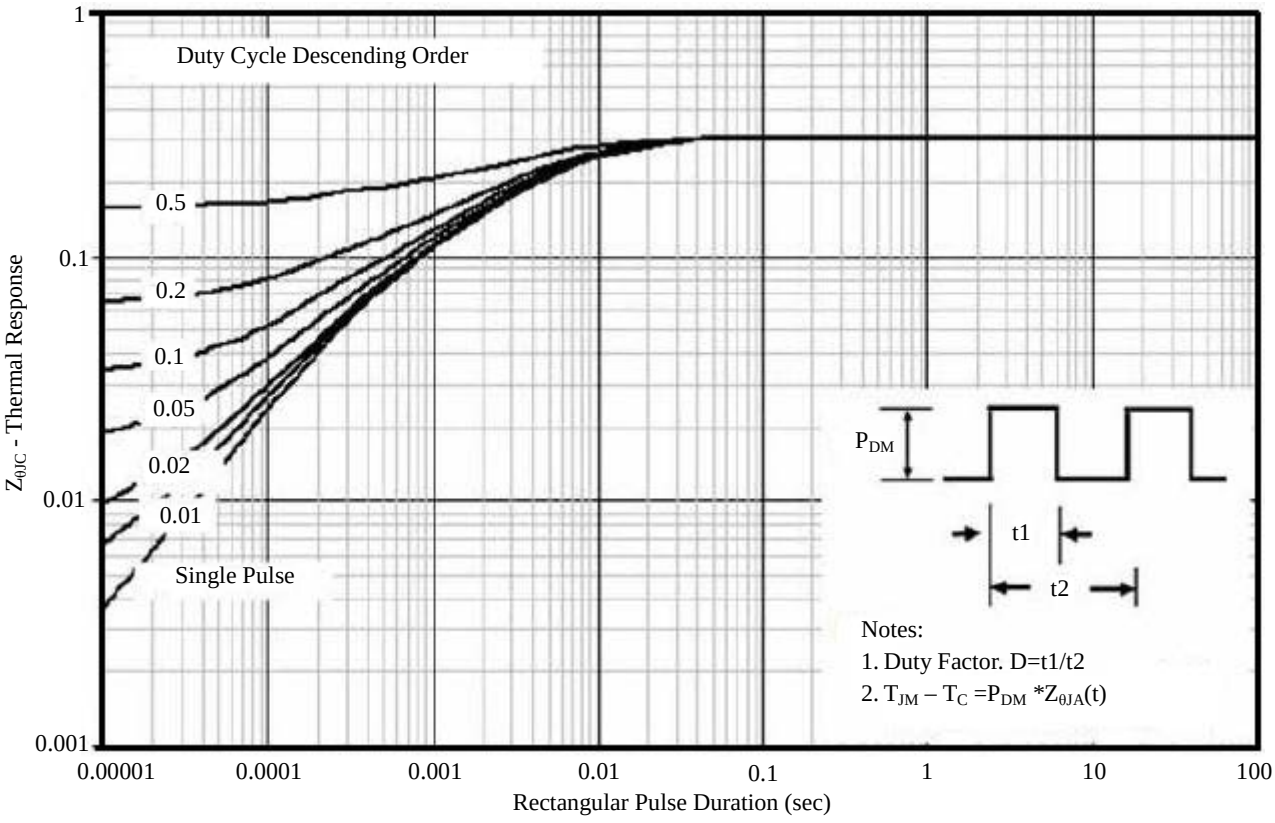
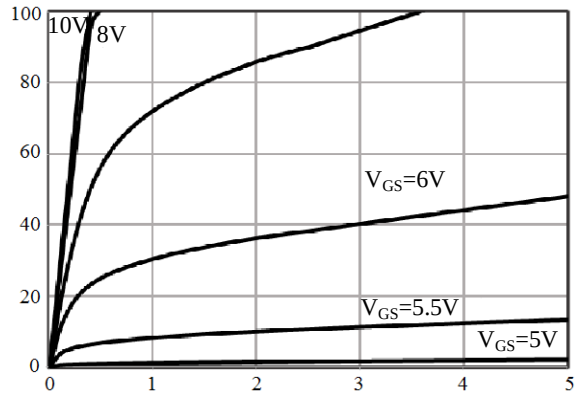


Figure.9 Normalized Maximum Transient Thermal Impedance





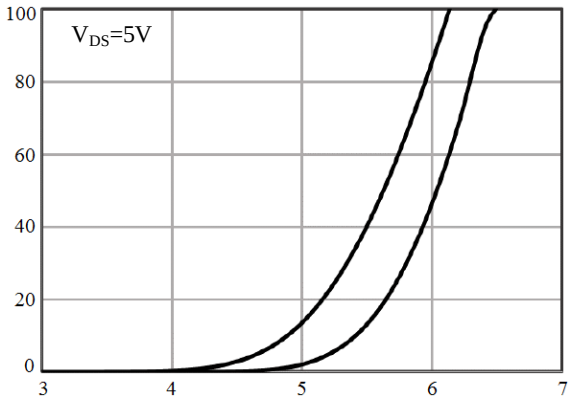


Figure 3: On-Resistance vs. I_D and V_{GS}

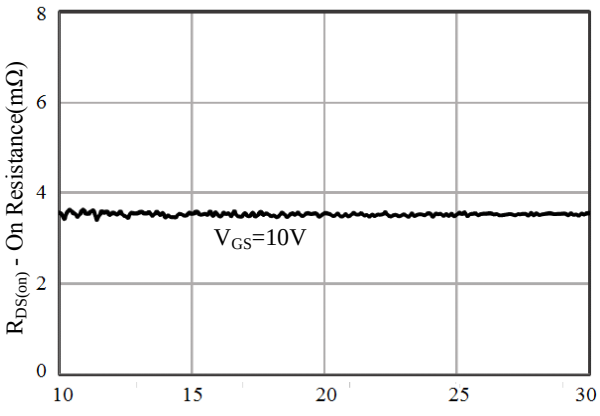


Figure 4: On-Resistance vs. Junction Temperature

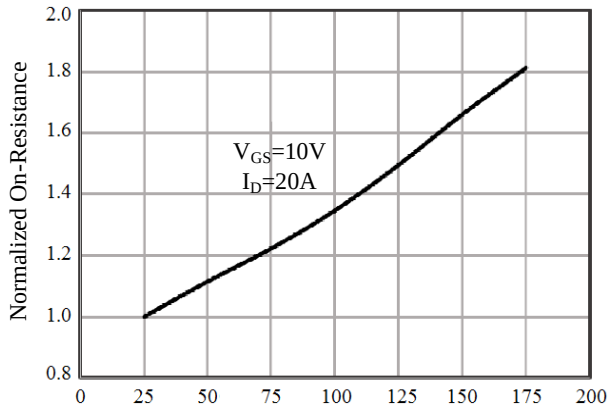


Figure 5: On-Resistance vs. Gate-Source Voltage

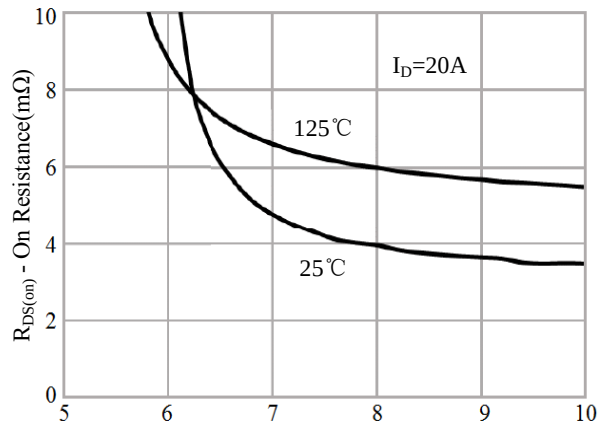
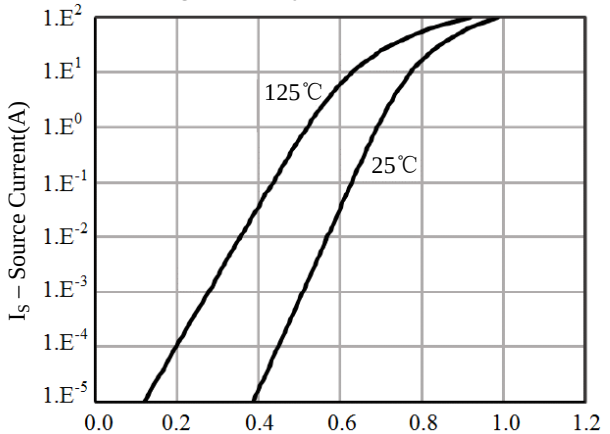


Figure 6: Body-Diode Characteristics



Typical Performance Characteristics

Figure 7 Gate-Charge Characteristics

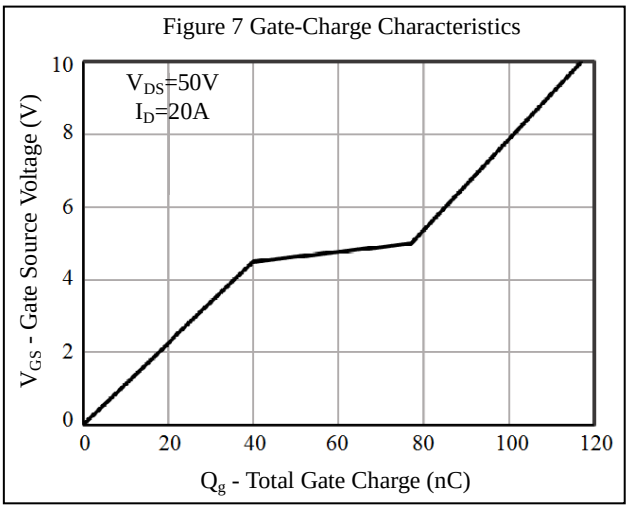


Figure 8: Capacitance Characteristics

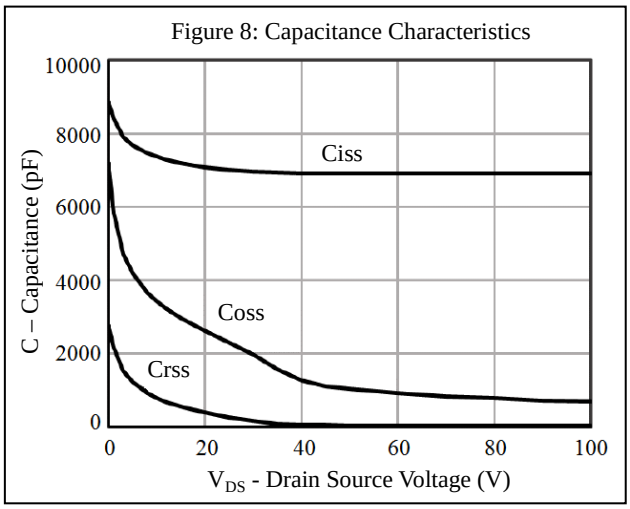
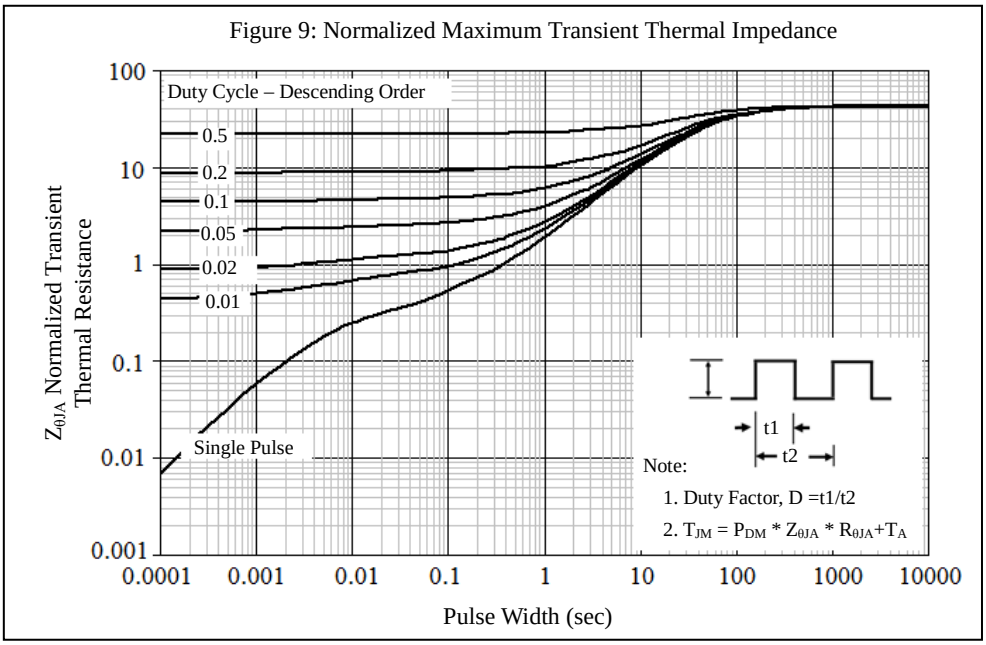
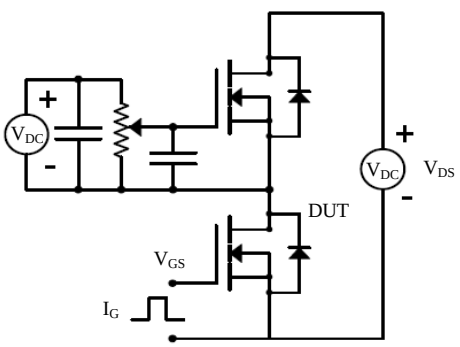


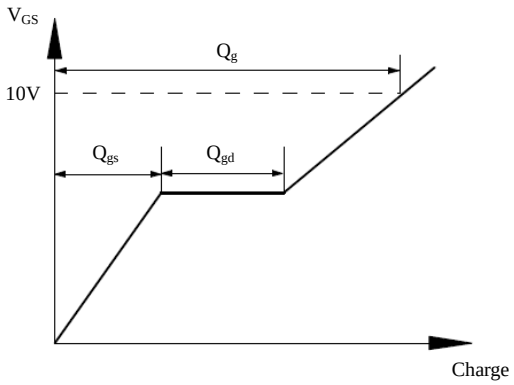
Figure 9: Normalized Maximum Transient Thermal Impedance



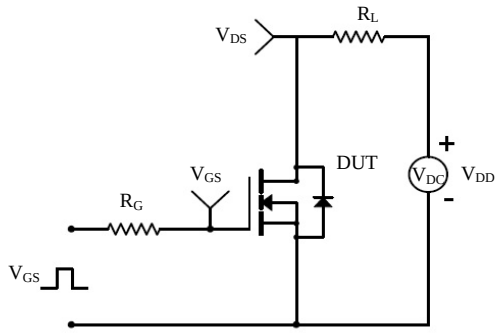
Test Circuit & Waveform

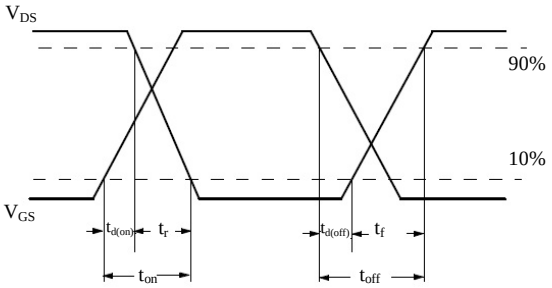
Gate Charge Test Circuit & Waveform

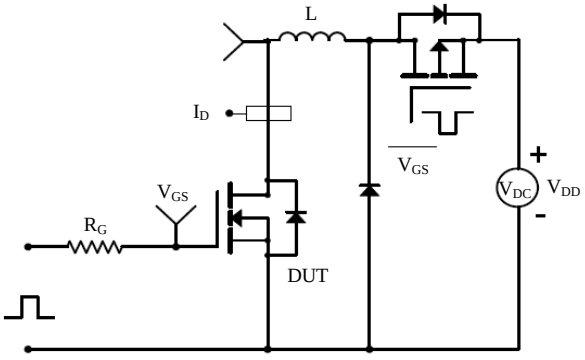


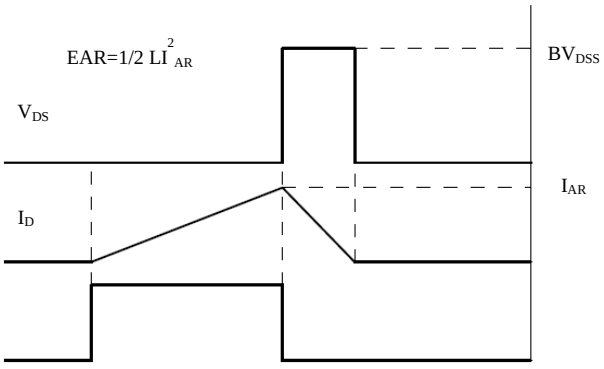


Resistive Switching Test Circuit & Waveforms

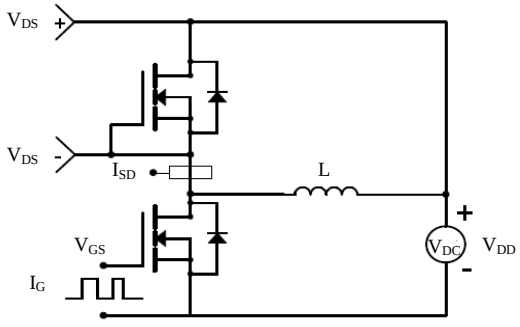


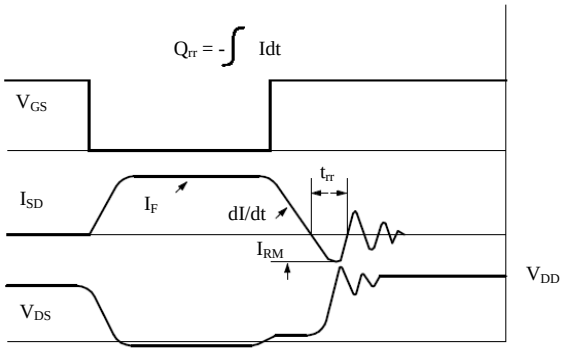




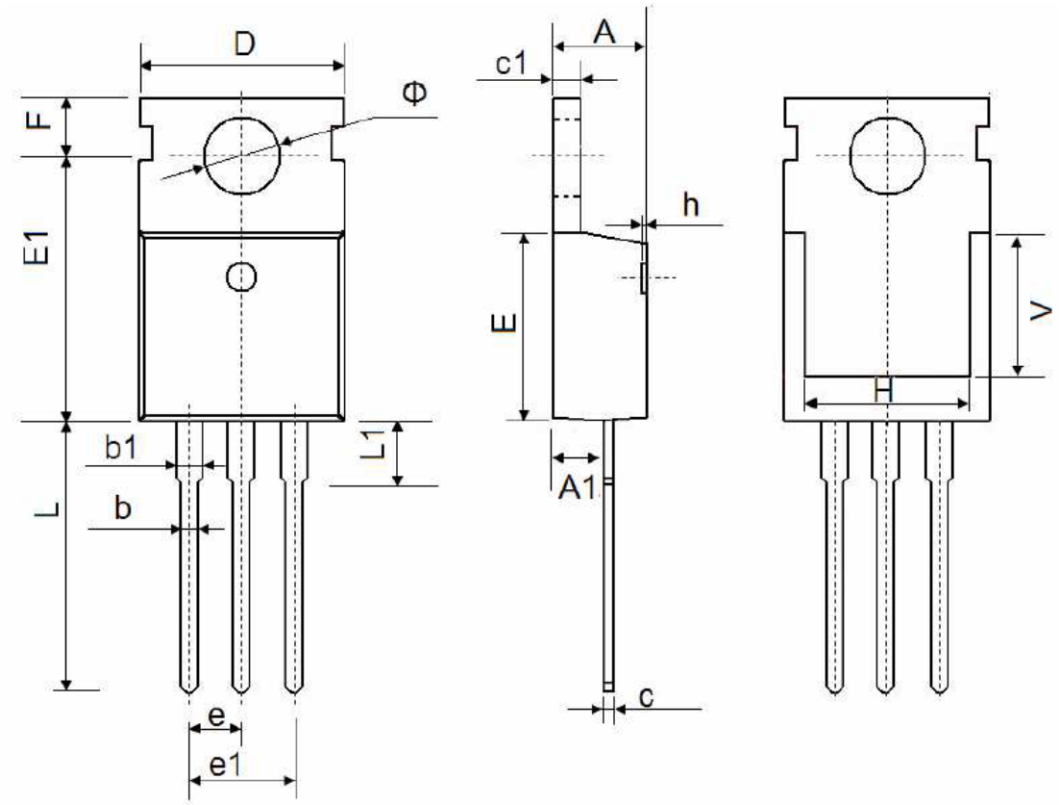


Diode Recovery Test Circuit & Waveforms





Package Outline: TO-220-3L



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.400	4.600	0.173	0.181
A1	2.250	2.550	0.089	0.100
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.330	0.650	0.013	0.026
c1	1.200	1.400	0.047	0.055
D	9.910	10.250	0.390	0.404
E	8.9500	9.750	0.352	0.384
E1	12.650	12.950	0.498	0.510
e	2.540 TYP.		0.100 TYP.	
e1	4.980	5.180	0.196	0.204
F	2.650	2.950	0.104	0.116
H	7.900	8.100	0.311	0.319
h	0.000	0.300	0.000	0.012
L	12.900	13.400	0.508	0.528
L1	2.850	3.250	0.112	0.128
V	7.500 REF		0.295 REF	
Φ	3.400	3.800	0.134	0.150

Notice

1. Specification of the products displayed herein is subject to change without notice. Continuous development may necessitate changes in technical data without notice. GEMMICRO or anyone on its behalf assumes no responsibility or liability for any errors or inaccuracies.

2. Stresses beyond those listed under “Absolute Maximum Ratings” may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications are not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.