A4G150N1200MT4

1200V N-Channel MOSFET

Features

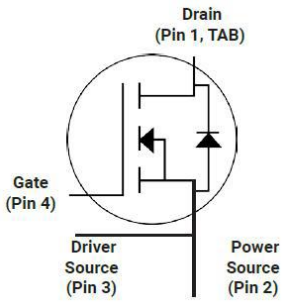
- High Speed Switching with Low Capacitances
- High Blocking Voltage with Low $R_{DS(on)}$
- Easy to parallel and simple to drive
- ROHS Compliant, Halogen free
- 4th Generation SiC MOSFET Technology

Application

- EV motor drive
- High Voltage DC/DC Converters
- Switch Mode Power Supplies
- Solar inverters
- EV charging

Product Summary

V_{DS}	1200V
I_D	150A



Ordering Information

Part Number	Marking	Package	Packaging
A4G150N1200MT4	A4G150N1200MT4	TO-247-4L	Tube

Absolute Maximum Ratings

Symbol	Parameter	Value	Unit
V_{DS}	Drain-Source Voltage	1200	V
I_D	Drain Current (continuous) at T_C=25°C	150	A
I_D	Drain Current (continuous) at T_C=100°C	105	A
I_{DM}	Drain Current (pulsed)	330	A
V_{GS}	Gate-Source Voltage	-10/+22	V
P_D	Power Dissipation T_C=25°C	625	W
T_J, T_{stg}	Junction and Storage Temperature Range	-55 to +175	°C

Electrical Characteristics (T_J=25°C unless otherwise specified)

Typical Performance-Static

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
BV_{DS}	Drain-source Breakdown Voltage	I_D=250uA, V_{GS}=0V	1200			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=1200V, V_{GS}=0V, T_J=25°C			100	uA
I_{GSS}	Gate-body Leakage Current	V_{DS}=0V, V_{GS}=-10 to 20V			250	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=20mA	2	2.8	4	V
V_{GSon}	Recommended turn-on Voltage	Static		15/18		V
V_{GSoff}	Recommended turn-off Voltage			-5		V
$R_{DS(on)}$	Static Drain-source On Resistance	V_{GS}=15V, I_D=75A		12	15	mΩ
		V_{GS}=15V, I_D=75A, T_J=175°C		20		
		V_{GS}=18V, I_D=75A		10	12.5	
		V_{GS}=18V, I_D=75A, T_J=175°C		16.6		

Typical Performance-Dynamic

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
C_{iss}	Input Capacitance	V_{DS}=1000V, f=1MHz V_{AC}=25mV		7980		pF
C_{oss}	Output Capacitance			312		pF
C_{rss}	Reverse Transfer Capacitance			16		pF
g_{fs}	Transconductance	V_{DS}=20V, I_D=50A		52		S
E_{OSS}	C_{OSS} Stored Energy	V_{DS}=1000V, f=1MHz		173		uJ
E_{ON}	Turn-On Energy (Body Diode)	V_{DS}=800V V_{GS}=-5/18V, I_D=75A L=68uH, T_J=175°C		1.28		mJ
E_{OFF}	Turn-Off Energy (Body Diode)			1.02		mJ
Q_g	Total Gate Charge	V_{DS}=800V V_{GS}=-5/18V I_D=75A		298		nC
Q_{gs}	Gate-source Charge			82		nC
Q_{gd}	Gate-Drain Charge			98		nC
$R_{G(int)}$	Internal Gate Resistance	f=1MHz, V_{AC}=25mV		2.0		Ω
$t_{d(on)}$	Turn-on Delay Time	V_{DS}=800V V_{GS}=-5/18V, I_D=75A L=68uH, R_{ext}=2.5Ω		36		ns
t_r	Rise Time			29		ns
$t_{d(off)}$	Turn-off Delay Time			80		ns
t_f	Fall Time			19		ns

Typical Performance-Reverse Diode (T_J=25°C unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V_{FSD}	Forward Voltage	V_{GS}=0V, I_F=55A, T_J=25°C		3.1	6	V
		V_{GS}=0V, I_F=55A, T_J=175°C		3.3	6	V
I_S	Continuous Diode Forward Current	V_{GS}=0V, T_C=25°C		120		A
t_{rr}	Reverse Recovery Time	V_{GS}=-5V, I_F=75A V_R=800V di/dt=1300A/μs, T_J=175°C		120		ns
Q_{rr}	Reverse Recovery Charge			797		nC
I_{rrm}	Peak Reverse Recovery Current			22		A

Thermal Characteristics

Symbol	Parameter	Value	Unit
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	0.24	°C/W
$R_{\theta JA}$	Thermal Resistance, Junction-to-Ambient	40	°C/W

The values are based on the junction-to case thermal impedance which is measured with the device mounted to a large heat sink assuming maximum junction temperature of T_j(max)=175°C.

Electrical Characteristics

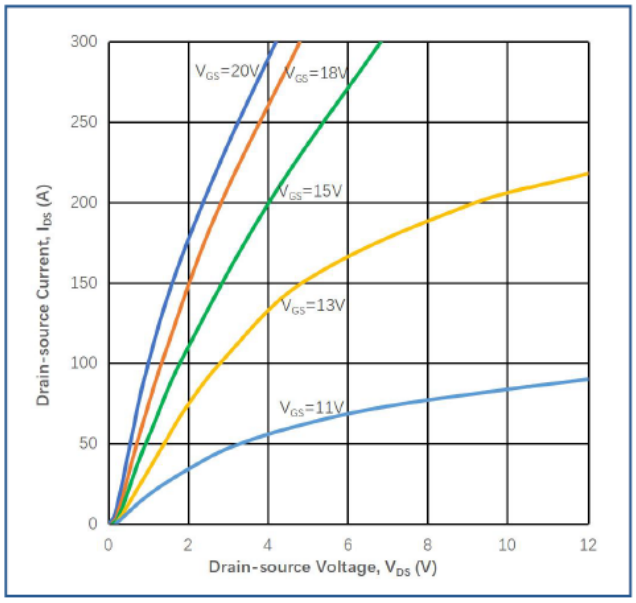


Figure 1

Output Characteristics (T_J=25 °C)

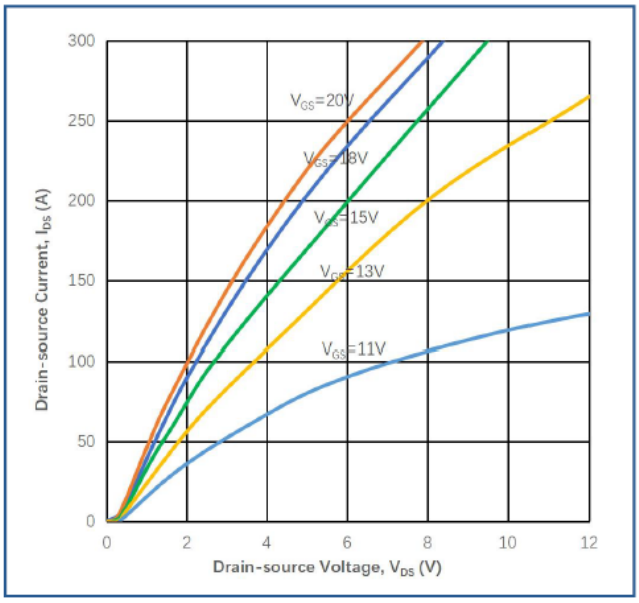


Figure 2

Output Characteristics (T_J=175°C)

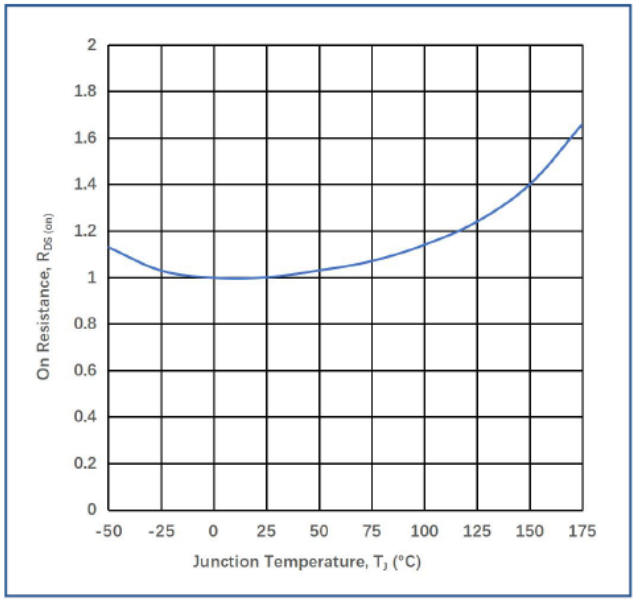


Figure 3

Normalized On-resistance vs. Temperature

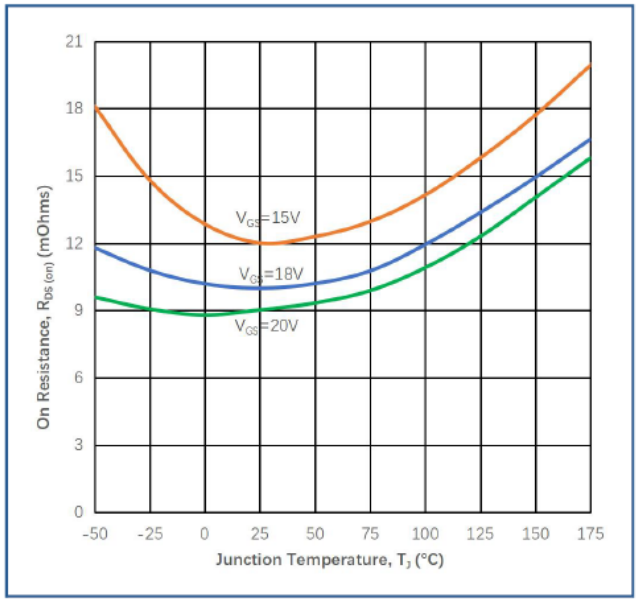


Figure 4

On-resistance vs. Temperature

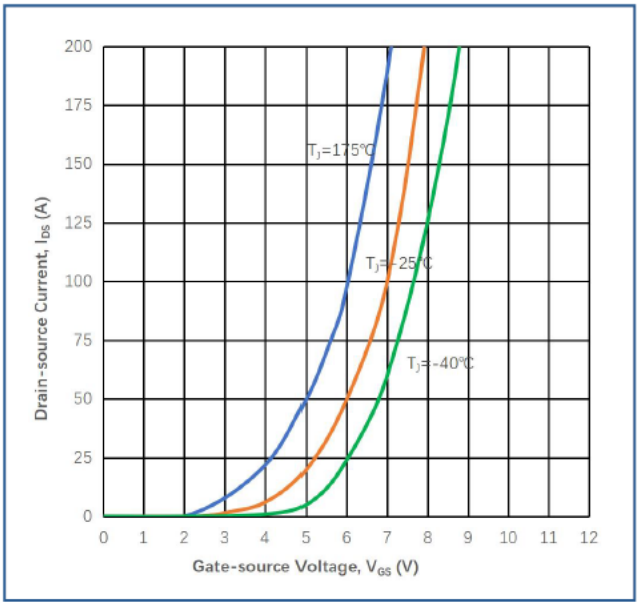


Figure 5
Transfer Characteristic

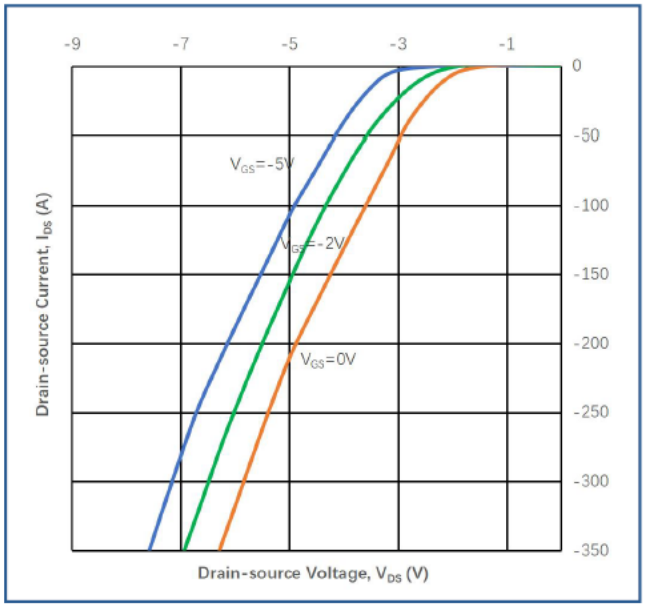


Figure 6
Body Diode Characteristic at 25°C

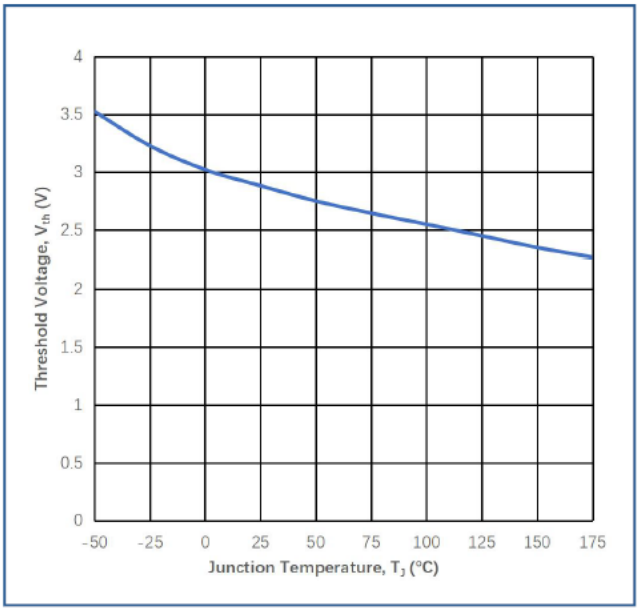


Figure 7
Threshold Voltage vs. Temperature

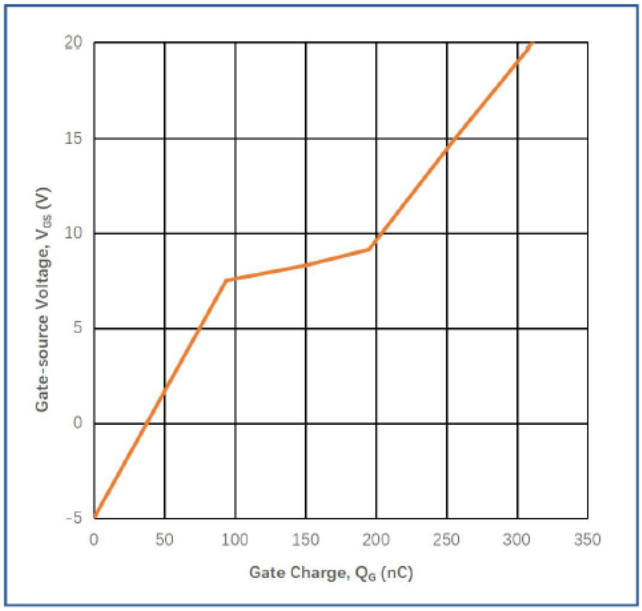


Figure 8
Gate Charge Characteristics

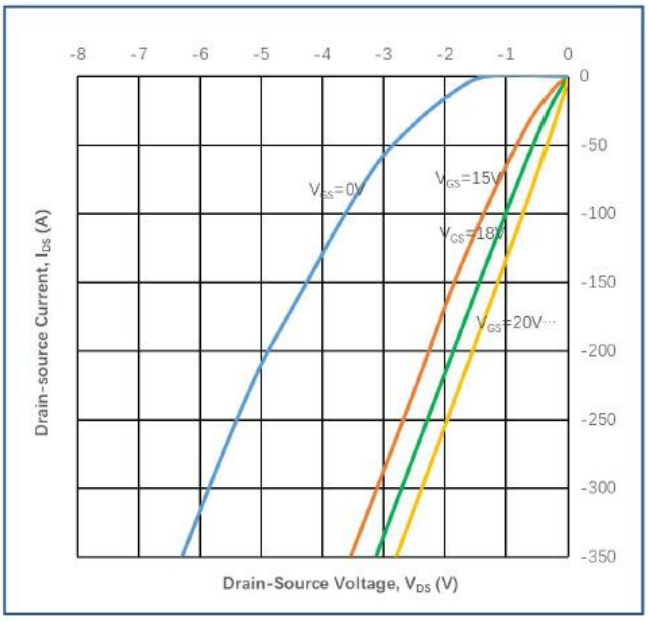


Figure 9

3rd Quadrant Characteristic at 25°C

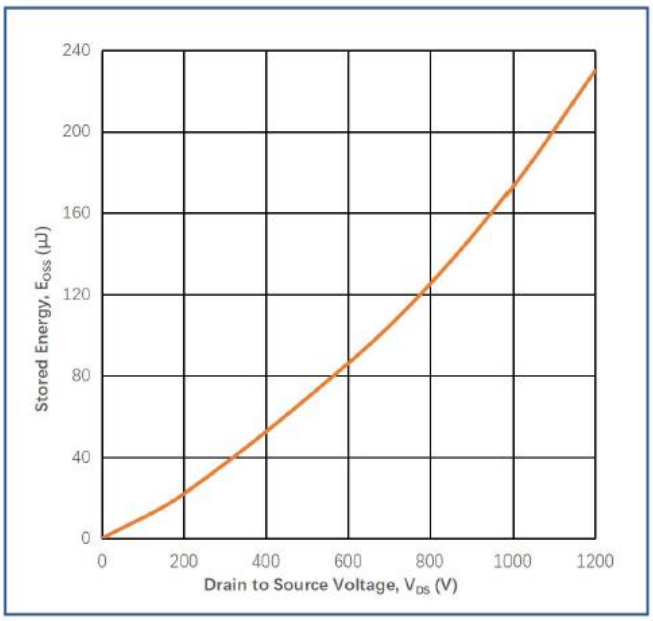


Figure 10

Output Capacitor Stored Energy

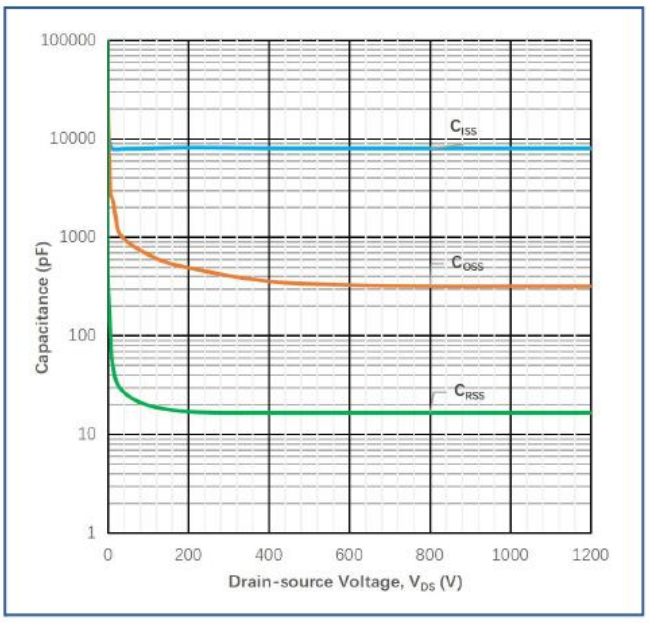


Figure 11

Capacitances vs. Drain-source

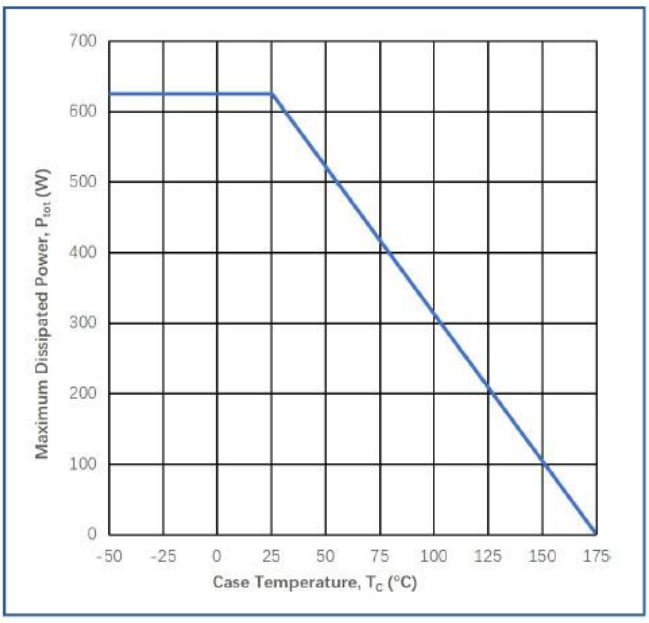


Figure 12

Max Power Dissipation Derating vs T_C

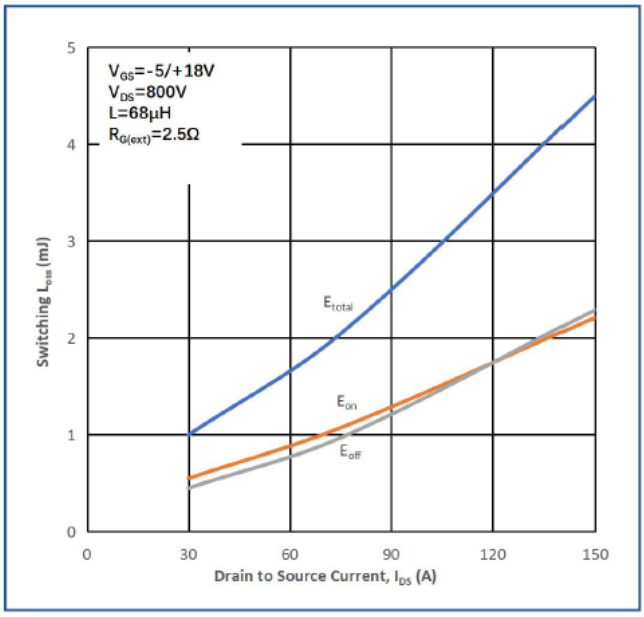


Figure 13

Switching Energy vs. Drain Current

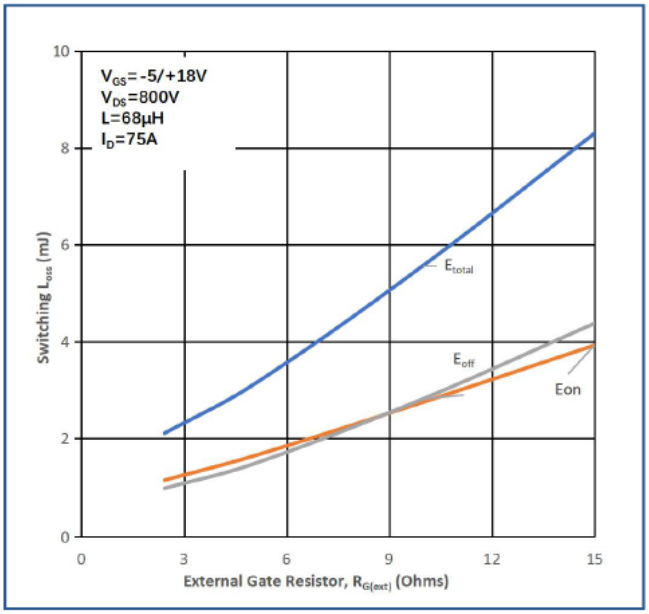


Figure 14

Switching Energy vs. $R_{G(ext)}$

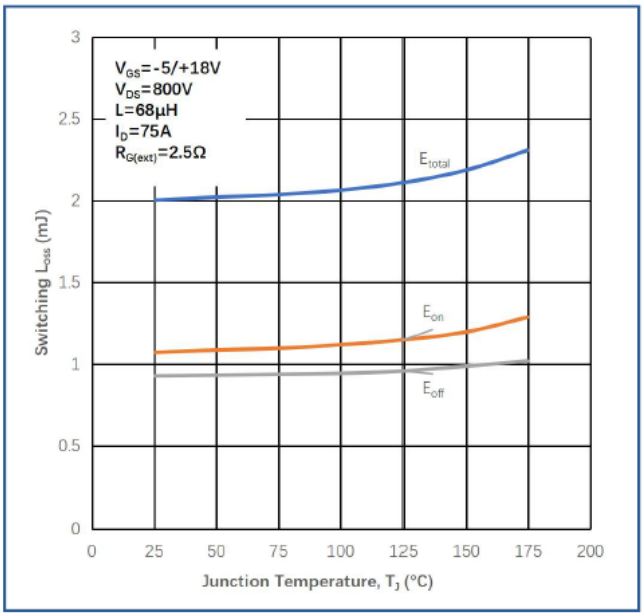


Figure 15

Switching Energy vs. Temperature

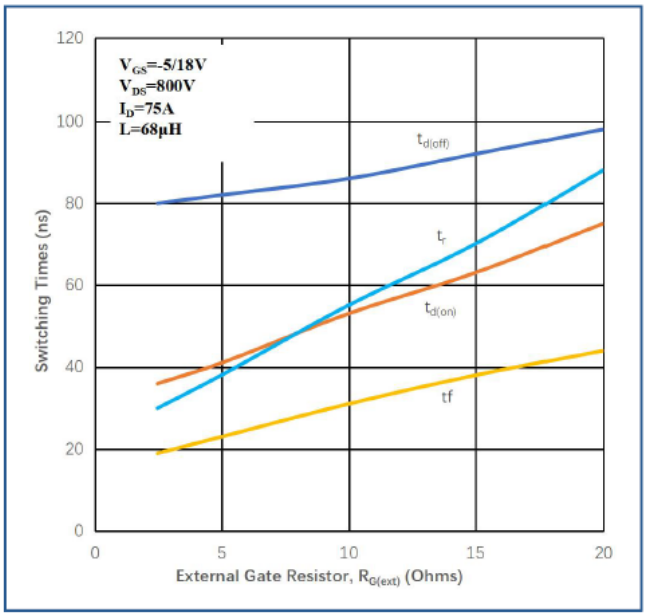


Figure 16

Switching Times vs. $R_{G(ext)}$

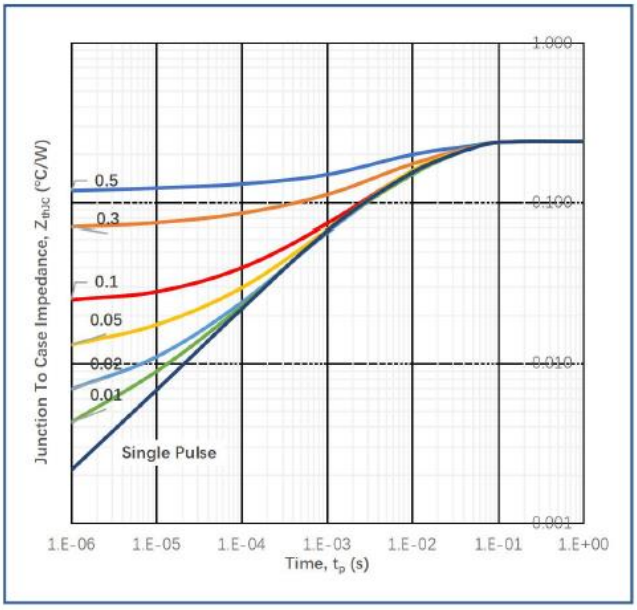


Figure 17

Transient Thermal Impedance

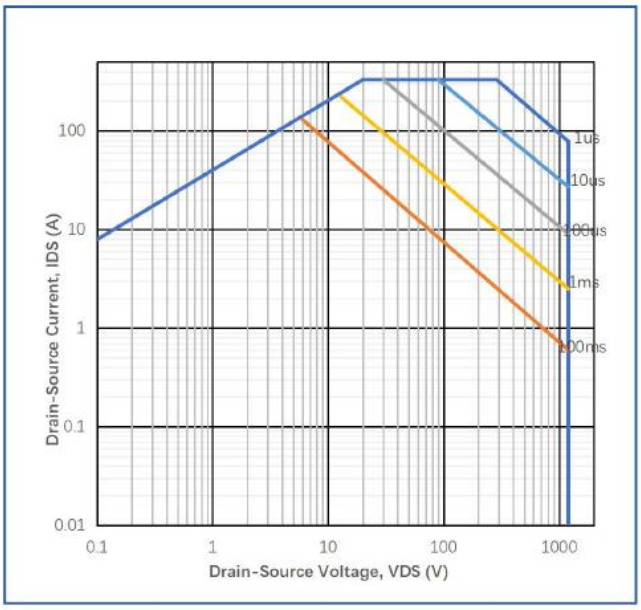
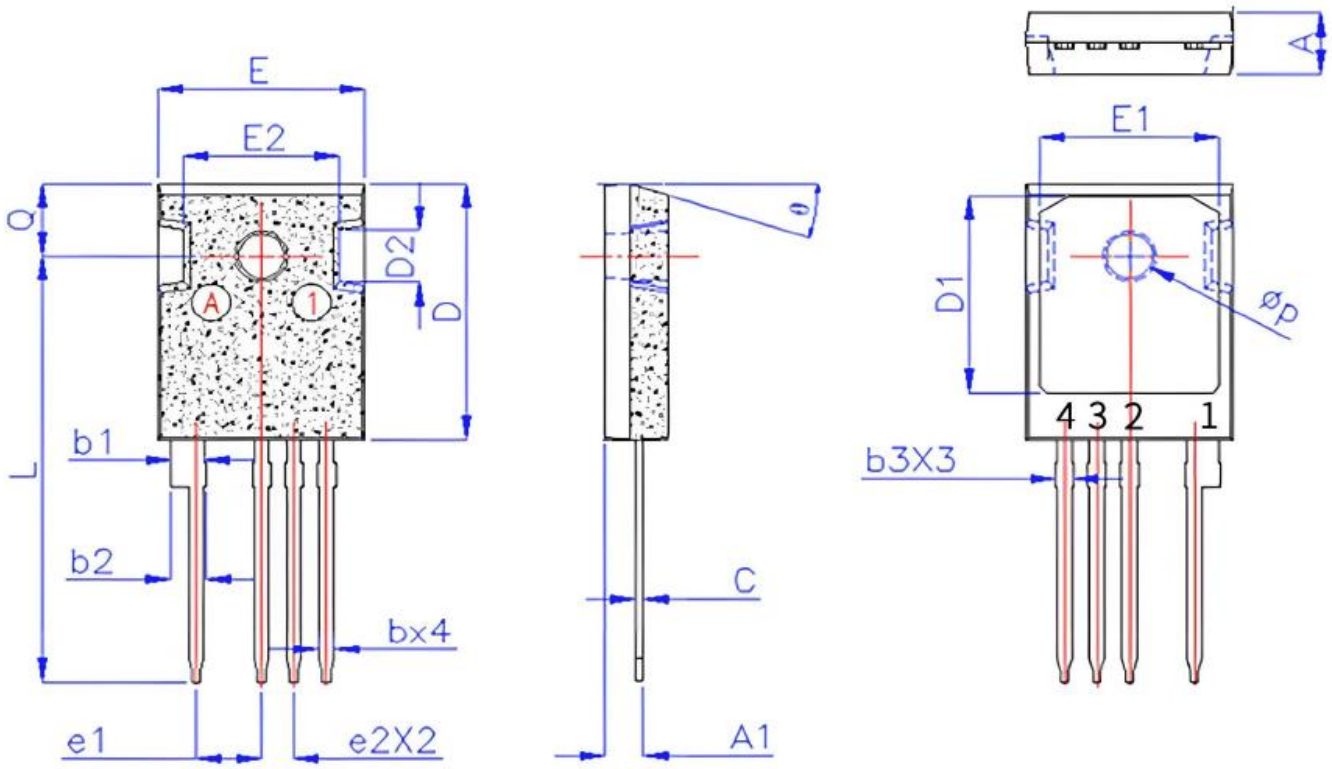


Figure 18

Safe Operating Area

Package Drawing TO-247-4L



Dimensions

Symbols	Dimensions in millimeters			Dimensions in inches		
	Min.	Type	Max.	Min.	Type	Max.
A	4.80	5.00	5.20	0.189	0.197	0.205
A1	2.85	3.00	3.15	0.112	0.118	0.124
b	1.15	1.20	1.25	0.045	0.047	0.049
b1	2.40	2.50	2.10	0.094	0.098	0.102
b2	2.61	2.76	3.10	0.103	0.109	0.155
b3	1.30	1.42	1.57	0.051	0.056	0.062
C	0.55	0.60	0.65	0.022	0.024	0.026
D	20.80	21.00	21.20	0.819	0.827	0.835
D1	15.94	16.24	16.54	0.628	0.639	0.651
D2		4.30 BSC			0.169 BSC	
e1	4.93	5.08	5.23	0.194	0.200	0.206
e2	2.39	2.54	2.69	0.094	0.100	0.106
E	15.95	16.15	16.35	0.628	0.636	0.644
E1	13.82	14.02	14.26	0.544	0.552	0.561
E2	12.00	12.20	12.40	0.472	0.480	0.488
L	34.65	35.05	35.45	1.364	1.380	1.396
Q	5.85	5.95	6.05	0.230	0.234	0.238
øP	3.45	3.60	3.75	0.136	0.142	0.148
θ		17.5°			0.689°	

Revision version	Description	Date
1	Initial	04.2025