A3G75N1200MT4S

1200V N-Channel MOSFET, 75A, 30mΩ

Features

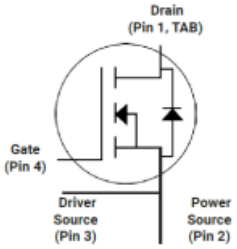
- High Speed Switching with Low Capacitances
- High Blocking Voltage with Low $R_{DS(on)}$
- Optimized package with separate driver source pin
- Easy to parallel and simple to drive
- ROHS Compliant, Halogen free

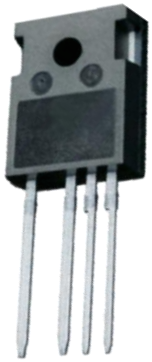
Application

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

V_{DS}	1200V
I_D	75A

Product Summary





Ordering Information

Part Number	Marking	Package	Packaging
A3G75N1200MT4S	A3G75N1200MT4S	TO-247-4S	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	75	A
I_D	Drain Current (continuous) at T_C=100°C	55	A
I_{DM}	Drain Current (pulsed)	188	A
V_{GS}	Gate-Source Voltage	-10/+22	V
P_D	Power Dissipation T_C=25°C	375	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		5	100	uA
I_{GSS}	Gate-body Leakage Current	V_{DS}=0V, V_{GS}=-10 to 20V		10	250	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=20mA	1.8	2.5	3.6	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=38A		36	43	mΩ
		V_{GS}=15V, I_D=38A, T_J=175°C		54		mΩ
		V_{GS}=18V, I_D=38A		30	36	mΩ
		V_{GS}=18V, I_D=38A, T_J=175°C		45		mΩ

Typical Performance-Dynamic

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
C_{iss}	Input Capacitance	V_{DS}=1000V, f=1MHz V_{AC}=25mV		2950		pF
C_{oss}	Output Capacitance			128		pF
C_{rss}	Reverse Transfer Capacitance			7.8		pF
g_{fs}	Transconductance	V_{DS}=20V, I_D=38A		23		S
E_{OSS}	C_{OSS} Stored Energy	V_{DS}=1000V, f=1MHz		72		uJ
E_{ON}	Turn-On Energy (Body Diode)	V_{DS}=800V V_{GS}=-5/18V, I_D=38A L=100uH, T_J=175°C		798		uJ
E_{OFF}	Turn-Off Energy (Body Diode)			115		uJ
Q_g	Total Gate Charge	V_{DS}=800V V_{GS}=-5/18V I_D=38A		120		nC
Q_{gs}	Gate-source Charge			44		nC
Q_{gd}	Gate-Drain Charge			35		nC
$R_{G(int)}$	Internal Gate Resistance	f=1MHz, V_{AC}=25mV		1.6		Ω
$t_{d(on)}$	Turn-on Delay Time	V_{DS}=800V V_{GS}=-5/18V, I_D=38A L=100uH, R_{ext}=2.5Ω		16		ns
t_r	Rise Time			23		ns
$t_{d(off)}$	Turn-off Delay Time			28		ns
t_f	Fall Time			12		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=20A, T_J=25°C		3.6	6	V
		V_{GS}=0V, I_F=20A, T_J=175°C		3.2	6	V
I_S	Continuous Diode Forward Current	V_{GS}=0V, T_C=25°C		68		A
t_{rr}	Reverse Recovery Time	V_{GS}=-5V, I_F=58A V_R=800V di/dt=1780A/μs, T_J=175°C		55		ns
Q_{rr}	Reverse Recovery Charge			788		nC
I_{rrm}	Peak Reverse Recovery Current					A

Thermal Characteristics

Symbol	Parameter	Value	Unit
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	0.48	°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

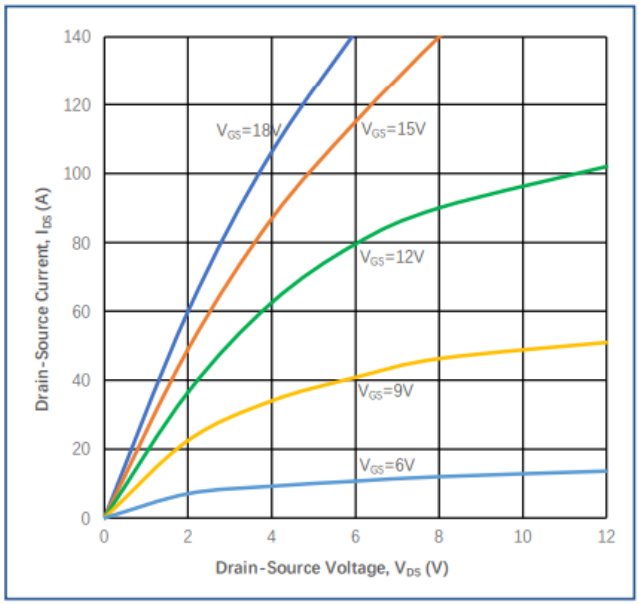


Figure 1
Output Characteristics (T_J=25 °C)

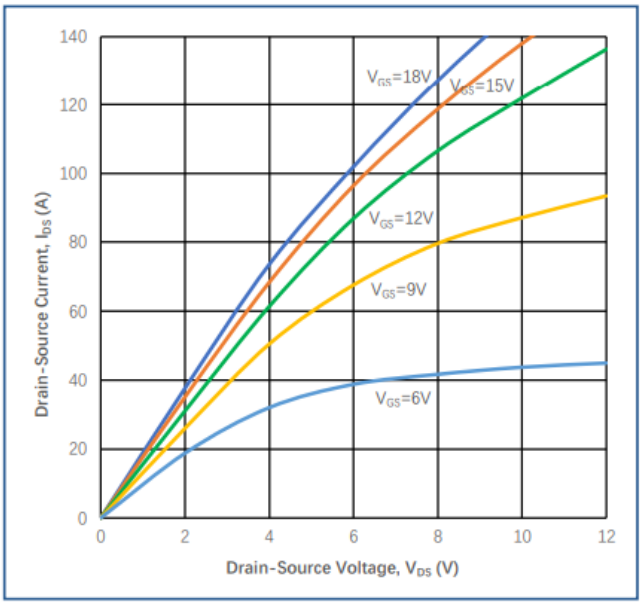


Figure 2
Output Characteristics (T_J=175°C)

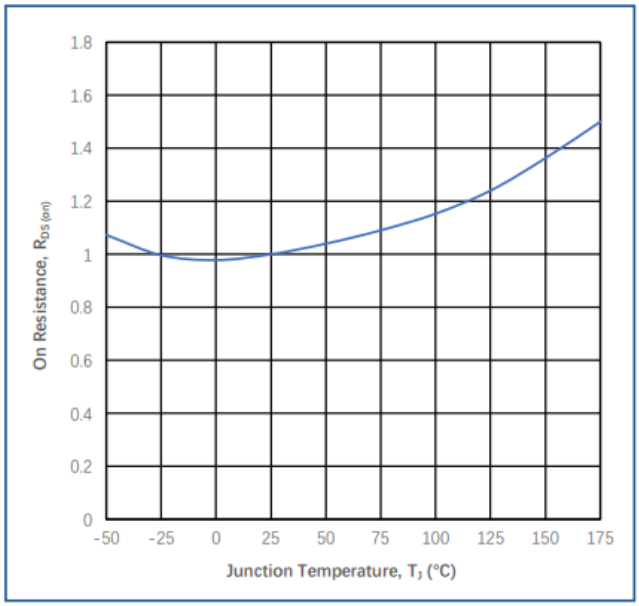


Figure 3
Normalized On-Resistance vs. Temperature

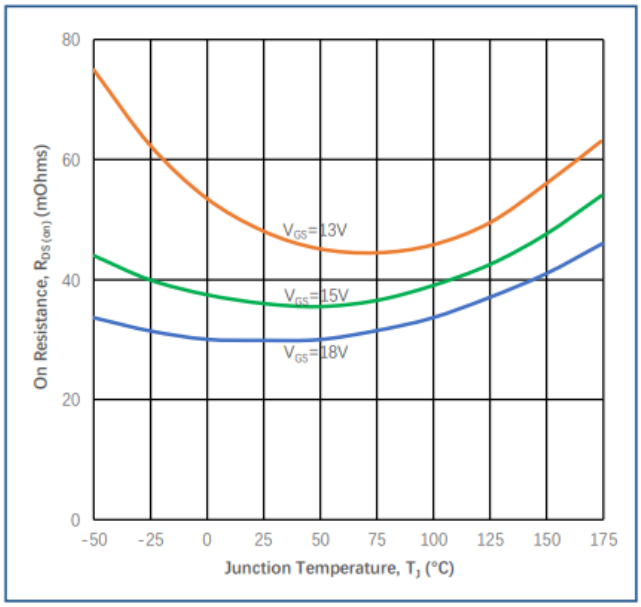


Figure 4
On-Resistance vs. Temperature

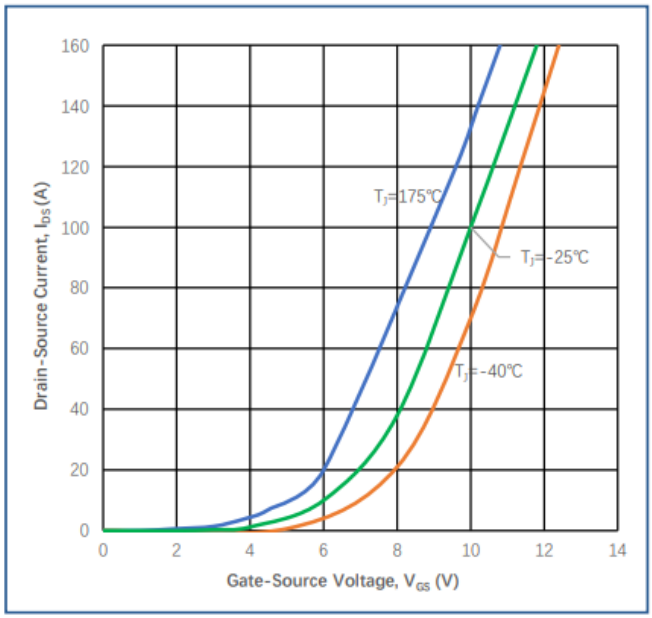


Figure 5
Transfer Characteristic

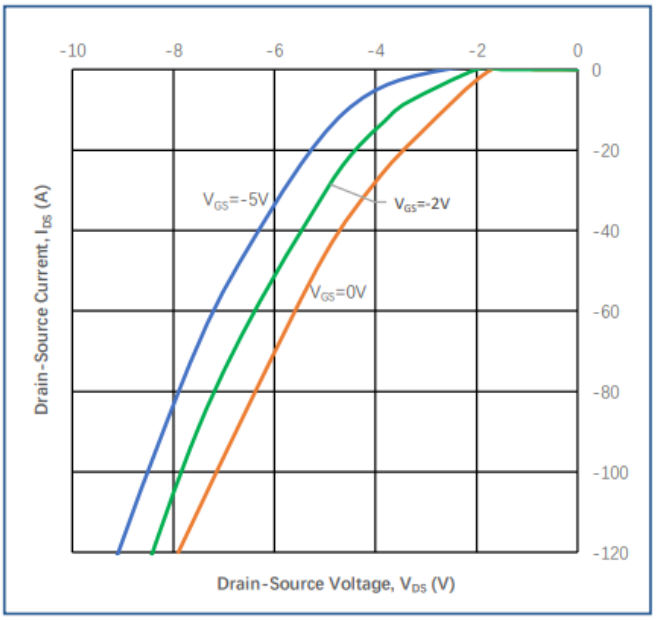


Figure 6
Body Diode Characteristic at 25°C

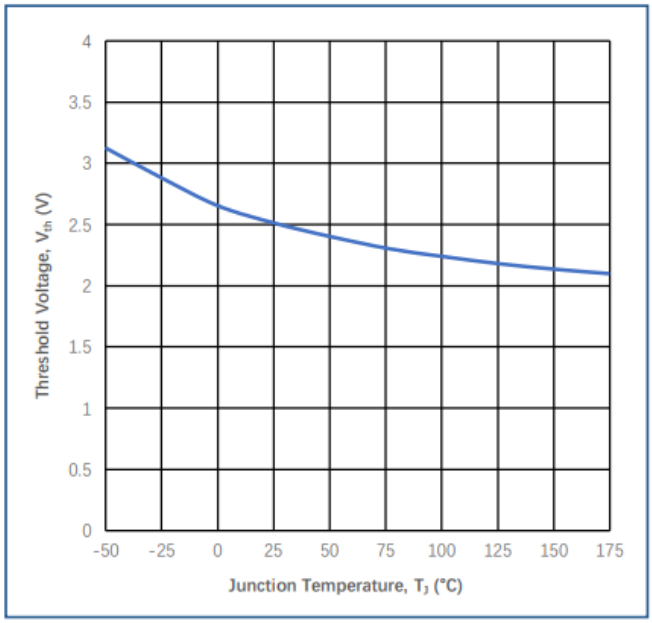


Figure 7
Threshold Voltage vs. Temperature

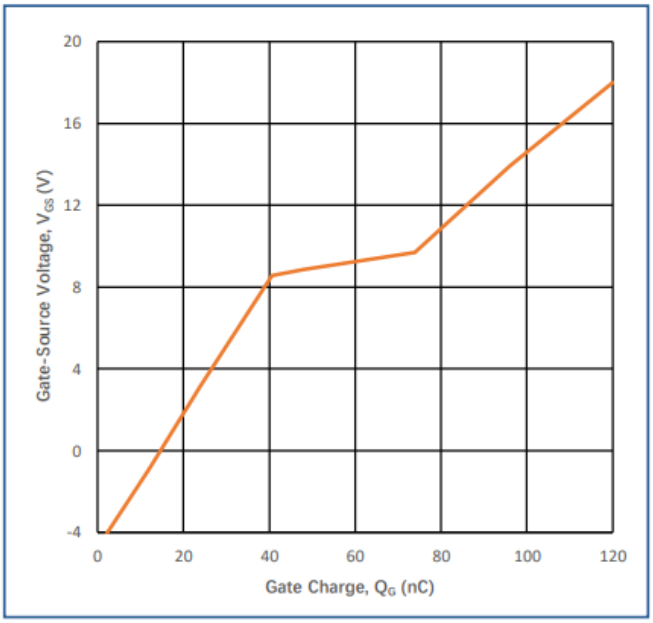


Figure 8
Gate Charge Characteristics

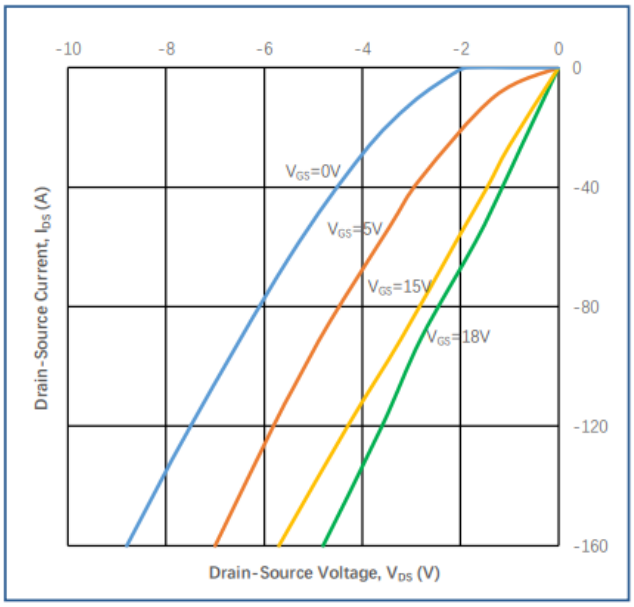


Figure 9

3rd Quadrant Characteristic at 25°C

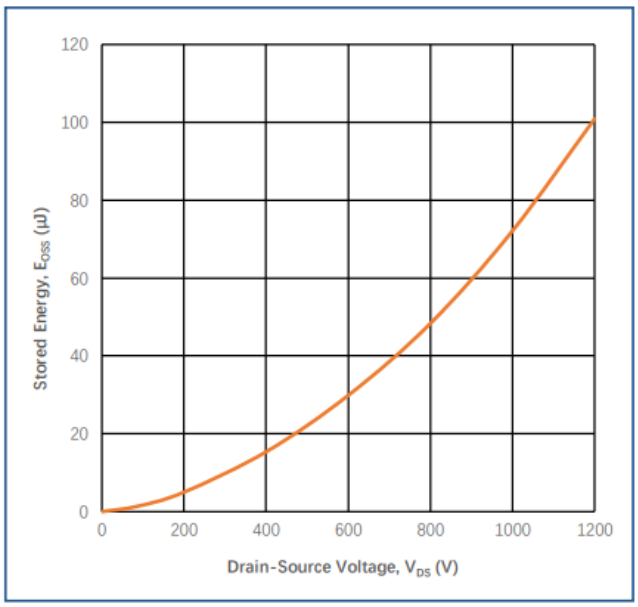


Figure 10

Output Capacitor Stored Energy

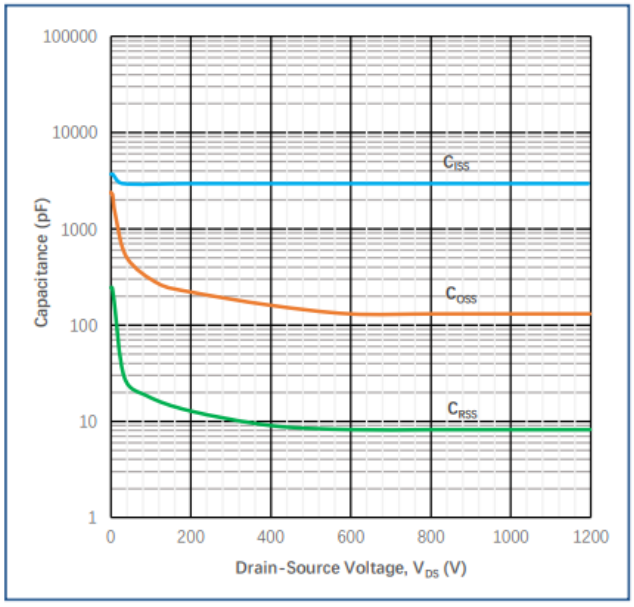


Figure 11

Capacitances vs. Drain-source

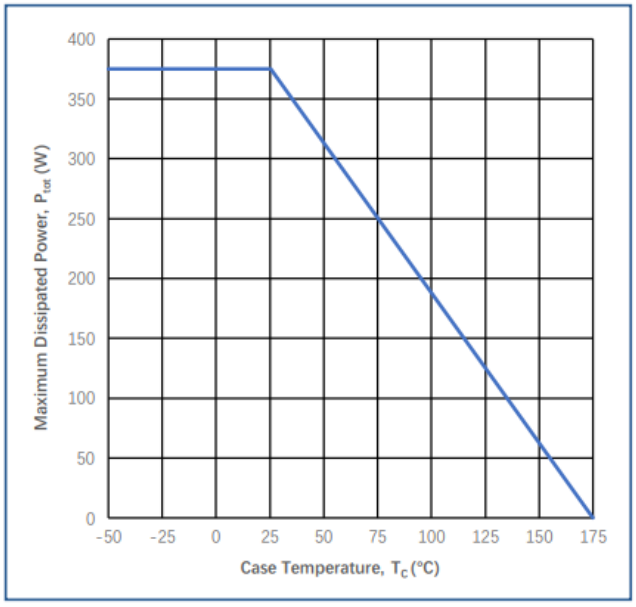


Figure 12

Max Power Dissipation Derating vs T_C

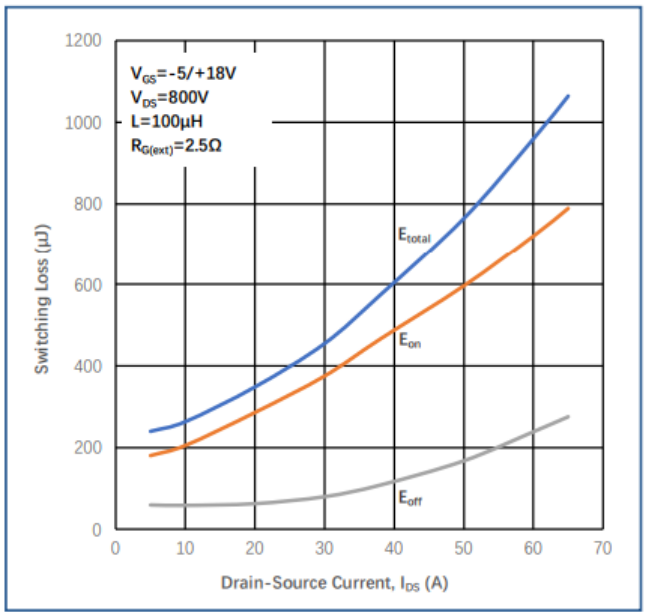


Figure 13
Switching Energy vs. Drain Current

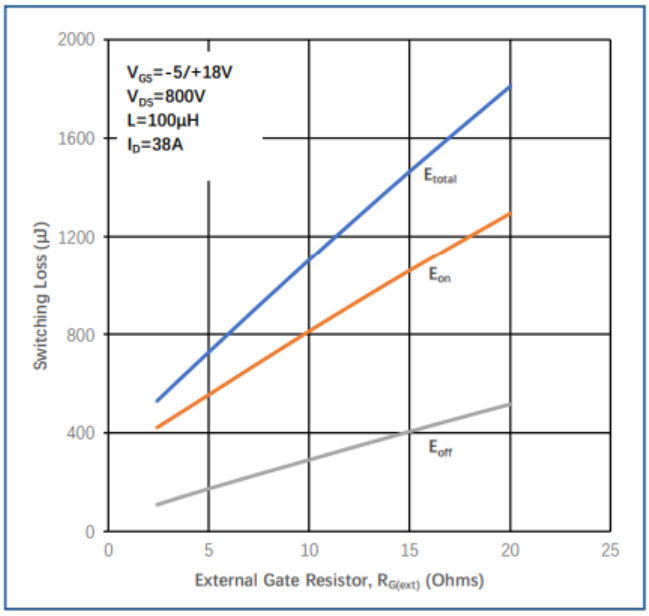


Figure 14
Switching Energy vs. $R_{G(ext)}$

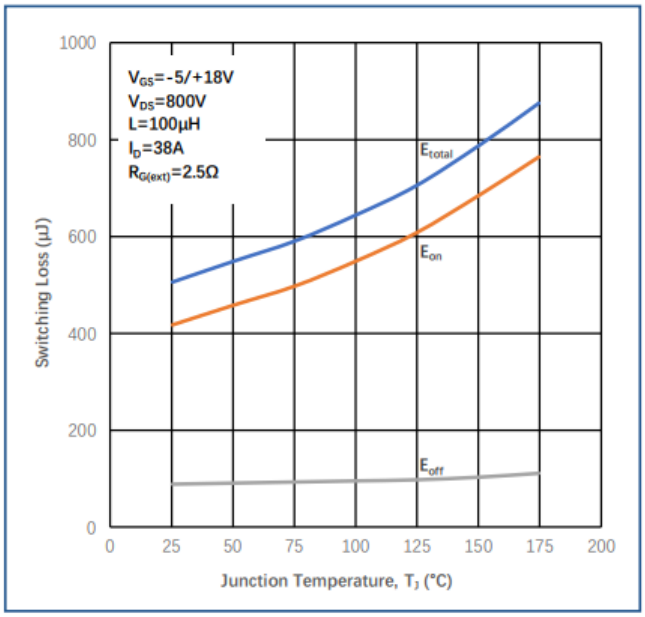


Figure 15
Switching Energy vs. Temperature

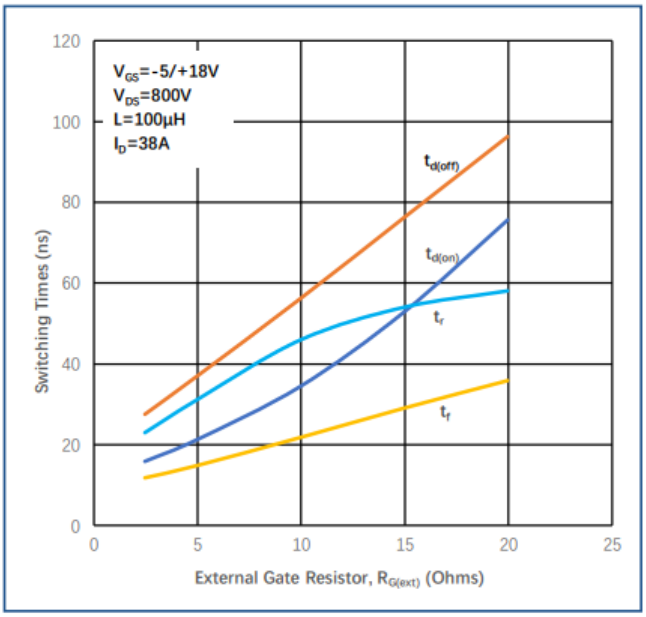


Figure 16
Switching Times vs. $R_{G(ext)}$

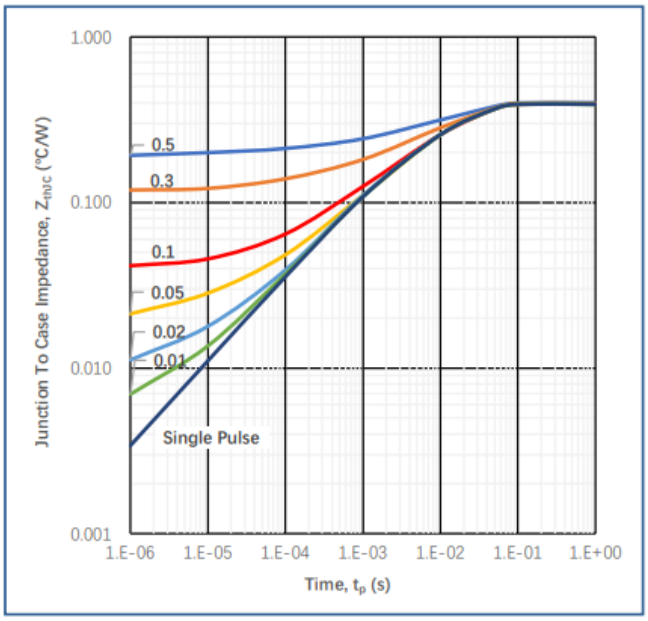


Figure 17
Transient Thermal Impedance

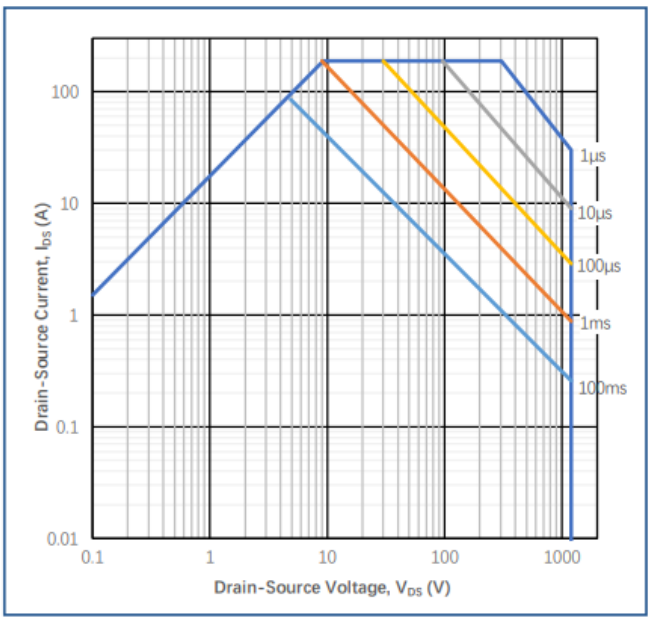
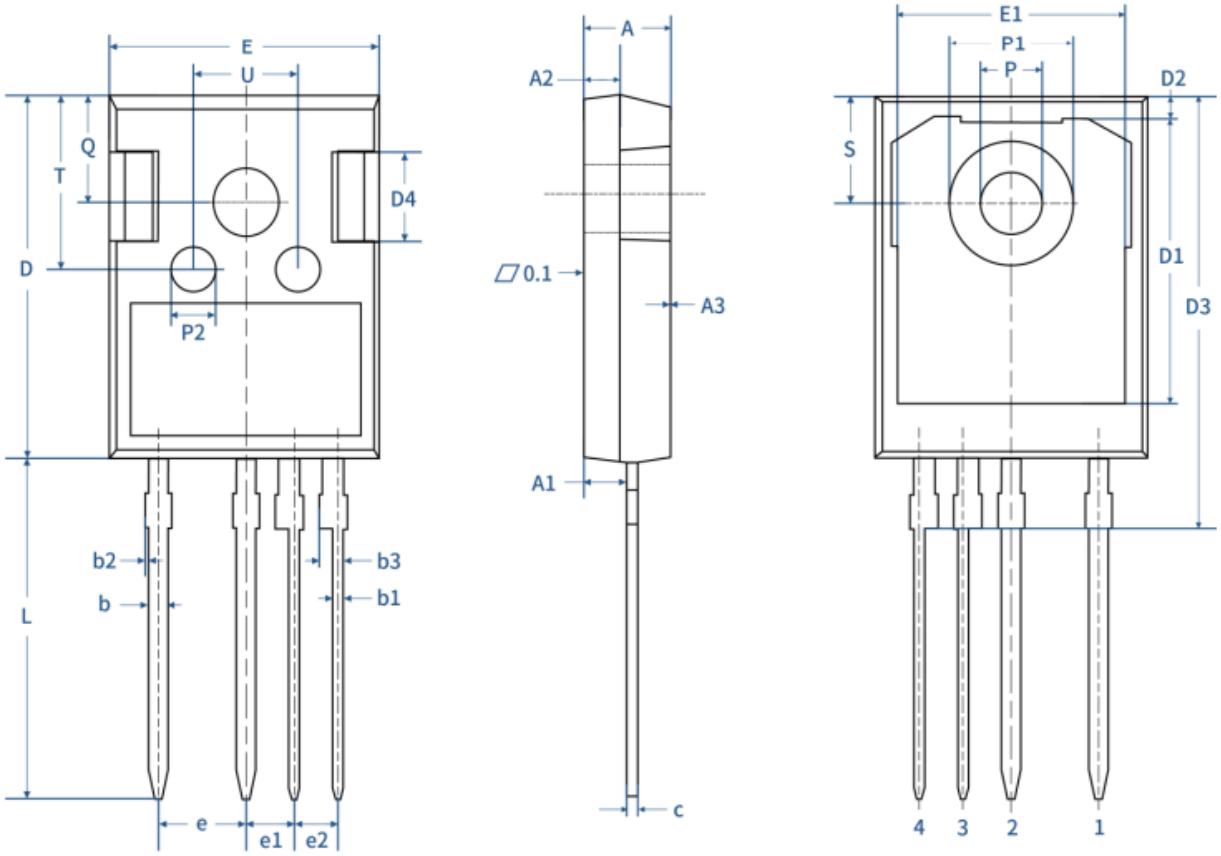


Figure 18
Safe Operating Area



Symbol	Millimeters		Symbol	Millimeters	
	Min.	Max.		Min.	Max.
A	4.9	5.1	E	15.7	15.9
A1	2.31	2.51	E1	13.1	13.5
A2	1.9	2.1	e	5.08	
A3	0.05	0.25	e1	2.79	
b	1.1	1.3	e2	2.54	
b1	0.65	0.79	L	19.8	20.1
b2	-	0.2	P	3.5	3.7
b3	1.34	1.44	P1	7	7.4
c	0.58	0.66	P2	2.4	2.6
D	20.9	21.1	Q	5.6	6
D1	16.25	16.85	S	6.15	-
D2	1.05	1.35	T	9.8	10.2
D3	24.97	25.27	U	6	6.4
D4	4.9	5.1			

Pin	Symbol	Description
1	D	Drain
2	S	Power Source
3	S	Driver Source
4	G	Gate
mb	D	Mounting Base; Connected to Drain

Note:

1. All metal surfaces are Sn plated (matte), except area of cut.
2. Burr or mold flash size (0.5 mm) is not included in the dimensions.

Revision version	Description	Date
1	Initial	01.2026