

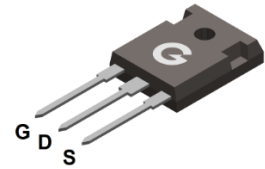
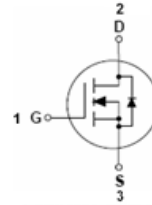
Features

- N-channel, normal level
- Excellent FOM
- Very low on-resistance $R_{DS(on)}$
- Ideal for high-frequency switching and synchronous rectification
- Pb-free lead plating; RoHS compliant

HF

Key performance parameters

Parameter	Value	Unit
V_{DS}	100	V
$R_{DS(on), max@10V}$	4.5	m Ω
$Q_{g, typ @10V}$	105	nC



TO-247

Mechanical Data

- Case: TO-247
- Molding Compound: UL Flammability Classification Rating 94V-0
- Terminals: Matte tin-plated leads; solderability-per MIL-STD-202, Method 208

Ordering Information

Part Number	Package	Shipping Quantity	Marking Code
BL045N10THU	TO-247	30 pcs / Tube	045N10THU

Maximum Ratings (@ $T_A = 25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain-to-Source Voltage	V_{DSS}	100	V
Gate-to-Source Voltage	V_{GSS}	± 20	V
Continuous Drain Current ($T_C = 25^\circ\text{C}$, Silicon limited)	I_D	180	A
Continuous Drain Current ($T_C = 100^\circ\text{C}$, Silicon limited)		113	A
Pulsed Drain Current *1	I_{DM}	670	A
Single Pulse Avalanche Energy *4	E_{AS}	560	mJ

Thermal Characteristics

Parameter	Symbol	Value	Unit
Power Dissipation ($T_C = 25^\circ\text{C}$)	P_D	260	W
Thermal Resistance Junction-to-Air *2	$R_{\theta JA}$	40	$^\circ\text{C}/\text{W}$
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	0.48	$^\circ\text{C}/\text{W}$
Operating Junction Temperature Range	T_J	-55 ~ +150	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-55 ~ +150	$^\circ\text{C}$

Electrical Characteristics (@ T_A = 25°C unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
V _{DSS}	Drain-Source Breakdown Voltage	V _{GS} = 0V, I _D = 1mA	100	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = 100V, V _{GS} = 0V	-	-	1	μA
I _{GSS}	Gate-Body Leakage Current	V _{GS} = ±20V, V _{DS} = 0V	-	-	±100	nA
R _{DS(ON)}	Static Drain-Source On-resistance ^{*2}	V _{GS} = 10V, I _D = 100A	-	3.7	4.5	mΩ
		V _{GS} = 6V, I _D = 50A	-	5	7.4	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = 150μA	2	2.9	4	V
R _G	Gate resistance	-	-	2.6	-	Ω
Dynamic Characteristics						
C _{ISS}	Input Capacitance	V _{GS} = 0V	-	6998		pF
C _{OSS}	Output Capacitance	V _{DS} = 50V	-	892		
C _{RSS}	Reverse Transfer Capacitance	f = 1.0MHz	-	40	-	
t _{d(ON)}	Turn-on Delay Time	V _{DD} = 50V V _{GS} = 10V R _G = 1.6Ω I _D = 50A	-	35	-	ns
t _r	Turn-on Rise Time					
t _{d(OFF)}	Turn-Off Delay Time					
t _f	Turn-Off Fall Time					
Gate charge characteristics						
Q _G	Total Gate-Charge	V _{DD} = 50V	-	105	-	nC
Q _{GS}	Gate to Source Charge	I _D = 100A	-	36.1	-	
Q _{GD}	Gate to Drain (Miller) Charge	V _{GS} = 10V	-	24.6	-	
Source-Drain Diode Characteristics						
V _{SD}	Diode Forward Voltage ^{*3}	I _{SD} = 10A, V _{GS} = 0V	-	1.0	1.2	V
I _{SD}	Diode Continuous Forward Current ^{*5}	T _C = 25°C	-	-	120	A
I _{SD, pulse}	Diode Pulse current	T _C = 25°C	-	-	670	A
t _{rr}	Reverse recovery time	V _R = 50V I _F = 30A, di/dt = 100A/us,	-	155	-	ns
Q _{rr}	Reverse recovery charge		-	390	-	nC
I _{RRM}	Reverse recovery current		-	4.7	-	A

Notes:

- See fig.11
- The data tested by surface mounted on suggest footprint
- The data tested by pulsed, pulse width ≤ 300μs, duty cycle ≤ 2%
- The E_{AS} data shows Max. rating. The test condition is V_{DD} = 50V, V_{GS} = 10V, L = 1mH
- The data is theoretically the same as I_D and I_{DM}, in real applications, should be limited by total power dissipation

Ratings and Characteristics Curves (@ $T_A = 25^\circ\text{C}$ unless otherwise specified)

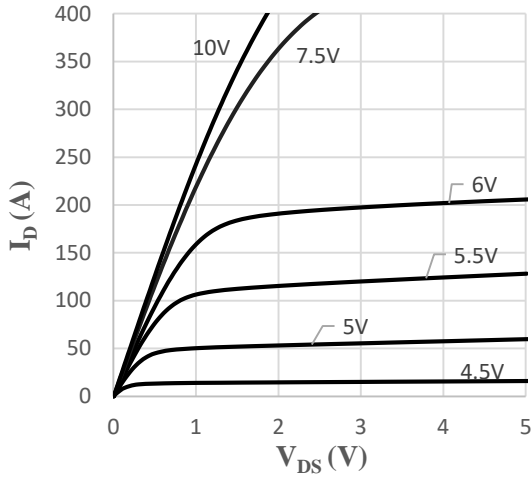


Fig 1 Typical Output Characteristics

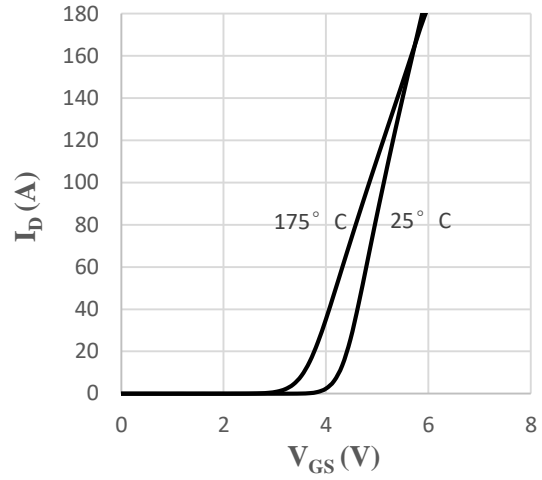


Fig 2 Transfer Characteristics

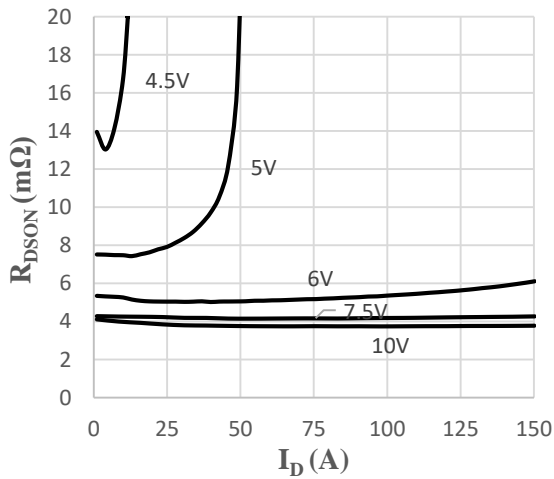


Fig 3 Drain-source on resistance

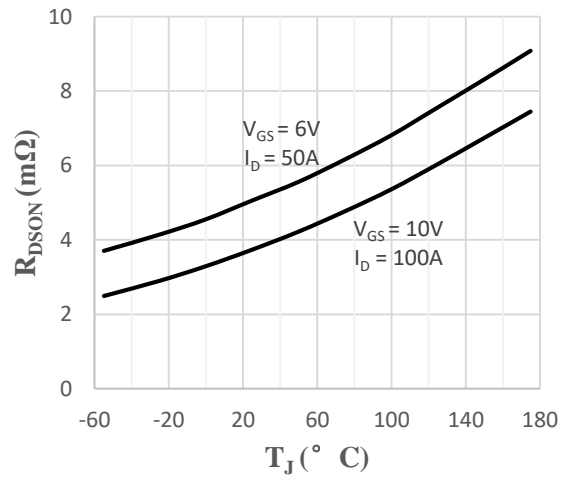


Fig 4 On-Resistance vs. Junction Temperature

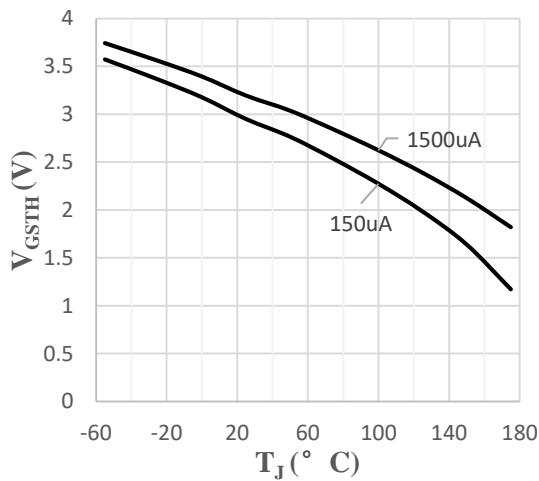


Fig 5 Gate Voltage vs. Junction Temp

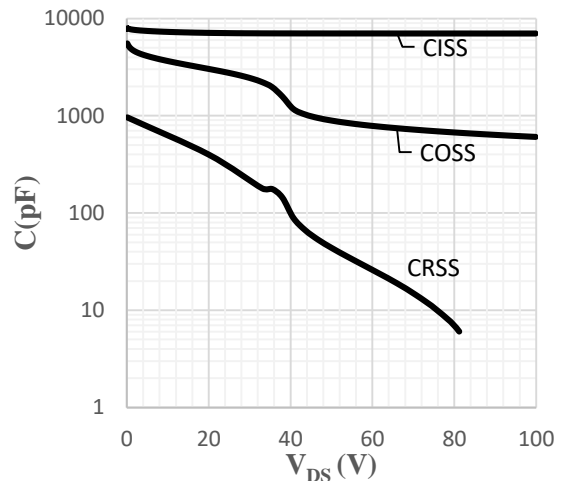


Fig 6 Capacitance Characteristics

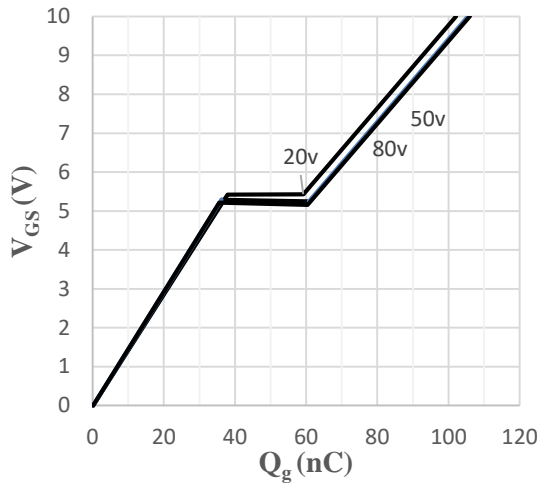


Fig 7 Gate-Charge Characteristics

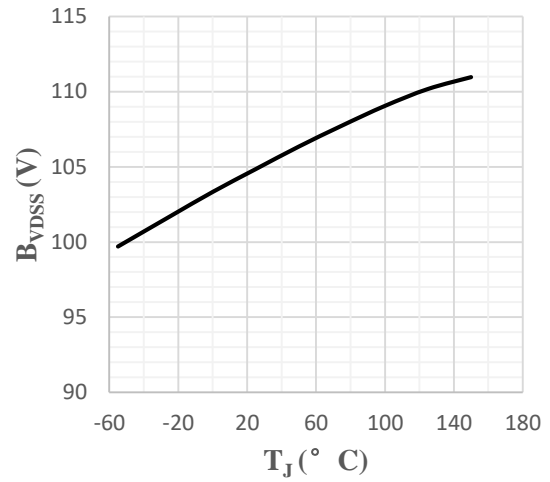


Fig 8 Drain-Source breakdown voltage

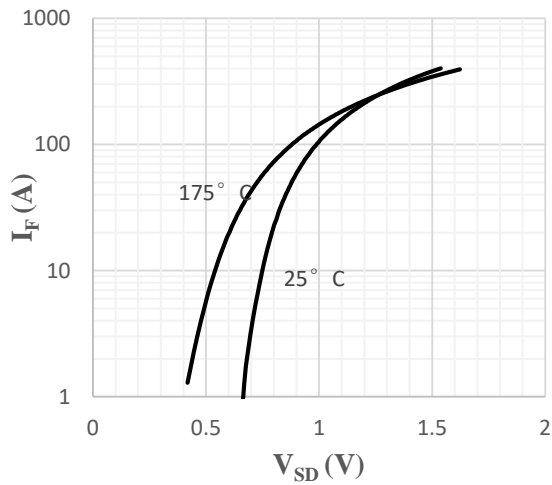


Fig 9 Forward characteristics of reverse diode

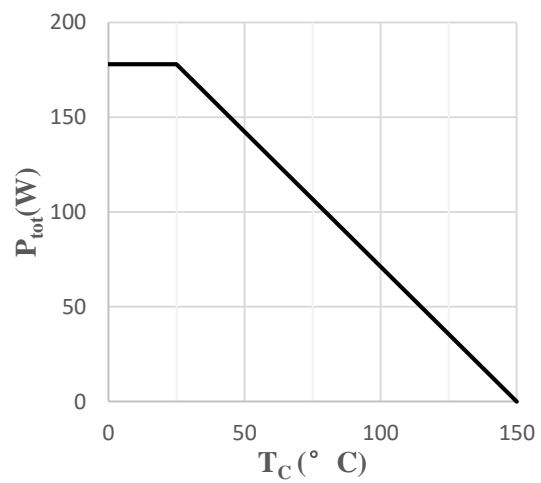


Fig 10 Power dissipation

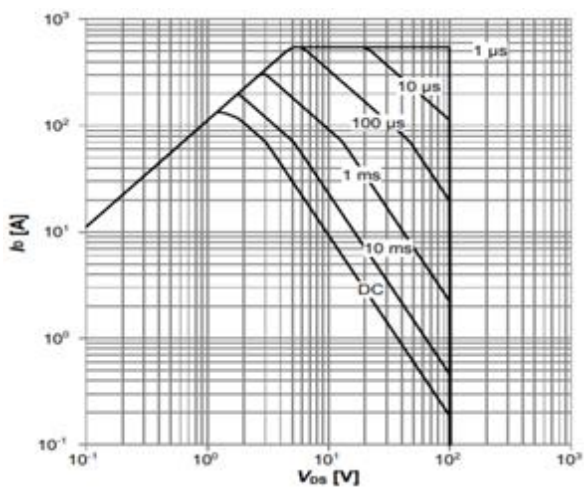


Fig 11 Safe operating area

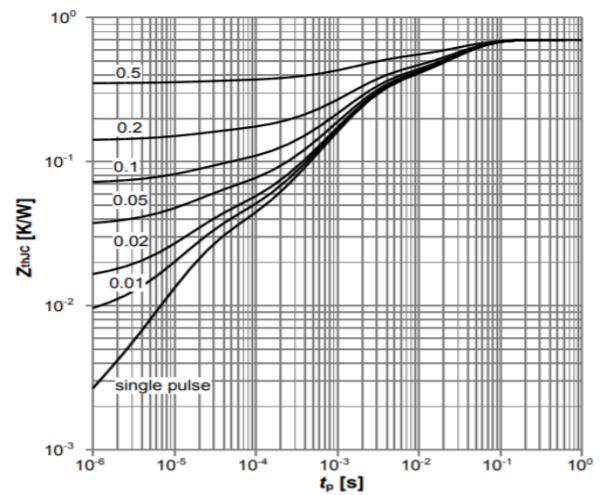
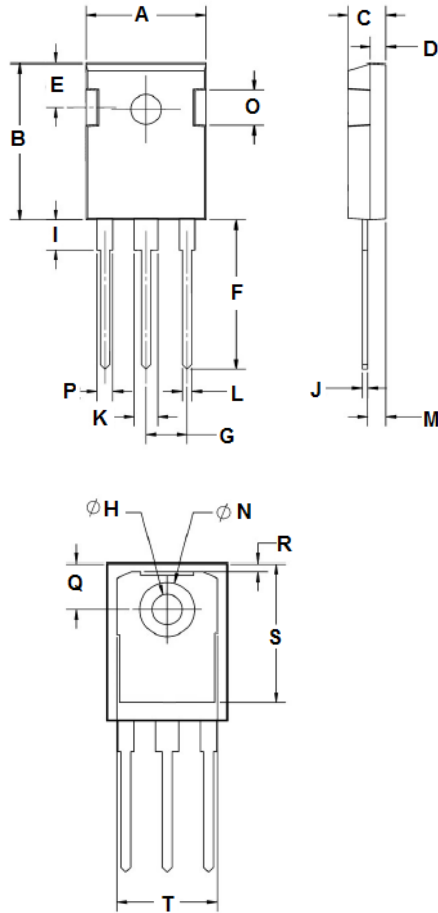


Fig 12 transient thermal impedance

Package Outline Dimensions (Unit: mm)



TO-247		
Dimension	Min.	Max.
A	15.50	16.10
B	20.70	21.30
C	4.70	5.30
D	1.80	2.20
E	5.20	5.80
F	19.70	20.30
G	5.20	5.60
H	3.30	3.70
I	3.90	4.30
J	0.50	0.70
K	2.80	3.20
L	1.00	1.40
M	2.20	2.60
N	7.00	7.20
O	4.90	5.30
P	1.80	2.20
Q	5.70	5.90
R	0.80	1.20
S	17.00	17.80
T	13.60	14.20

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