

Features

- N-channel, normal level
- Excellent FOM
- Very low on-resistance $R_{DS(on)}$
- Ideal for high-frequency switching and synchronous rectification

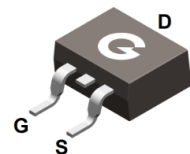
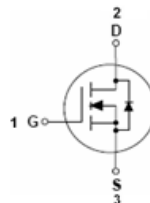
HF

Mechanical Data

- Case: TO-263
- Molding Compound: UL Flammability Classification Rating 94V-0
- Terminals: Matte tin-plated leads; solderability-per MIL-STD-202, Method 208

Key performance parameters

Parameter	Value	Unit
V_{DS}	85	V
$R_{DS(on)}$, max@10V	4.2	mΩ
Q_g , typ @10V	89	nC



TO-263

Ordering Information

Part Number	Package	Shipping Quantity	Marking Code
BL042N085THB	TO-263	50 pcs / Tube & 800 pcs / Tape & Reel	042N085THB

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

Parameter	Symbol	Value	Unit
Drain-to-Source Voltage	V_{DSS}	85	V
Gate-to-Source Voltage	V_{GSS}	± 20	V
Continuous Drain Current ($T_C = 25^\circ\text{C}$, Silicon limited)	I_D	210	A
Continuous Drain Current ($T_C = 100^\circ\text{C}$, Silicon limited)		133	A
Pulsed Drain Current ^{*1}	I_{DM}	548	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	305	W
Thermal Resistance Junction-to-Air ^{*2}	$R_{\theta JA}$	62	$^\circ\text{C/W}$
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	0.41	$^\circ\text{C/W}$
Operating Junction Temperature Range	T_J	$-55 \sim +150$	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	$-55 \sim +150$	$^\circ\text{C}$

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

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
V _{DSS}	Drain-Source Breakdown Voltage	V _{GS} = 0V, I _D = 250μA	85	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = 85V, 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	-	3.1	4.2	mΩ
		V _{GS} = 6V,I _D = 50A	-	4.2	7.4	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = 150μA	2	2.6	4	V
R _G	Gate resistance	-	-	2.9	-	Ω
Dynamic Characteristics						
C _{ISS}	Input Capacitance	V _{GS} = 0V V _{DS} = 50V f = 1.0MHz	-	6140	-	pF
C _{OSS}	Output Capacitance		-	1000	-	
C _{RSS}	Reverse Transfer Capacitance		-	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		-	18	-	
t _{d(OFF)}	Turn-Off Delay Time		-	45	-	
t _f	Turn-Off Fall Time		-	55	-	
Gate charge characteristics						
Q _G	Total Gate-Charge	V _{DD} = 50V I _D = 100A V _{GS} = 10V	-	89	-	nC
Q _{GS}	Gate to Source Charge		-	28	-	
Q _{GD}	Gate to Drain (Miller) Charge		-	20	-	
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	-	-	210	A
I _{SD, pulse}	Diode Pulse current	T _C = 25°C	-	-	548	A
t _{rr}	Reverse recovery time	V _R =50V I _F = 30A, di/dt=100A/us,	-	80	-	ns
Q _{rr}	Reverse recovery charge		-	160	-	nC
I _{RRM}	Reverse recovery current		-	3.9	-	A

Notes:

- See fig.11
- The data tested by surface mounted on suggest footprint
- The data tested by pulsed, pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
- 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)

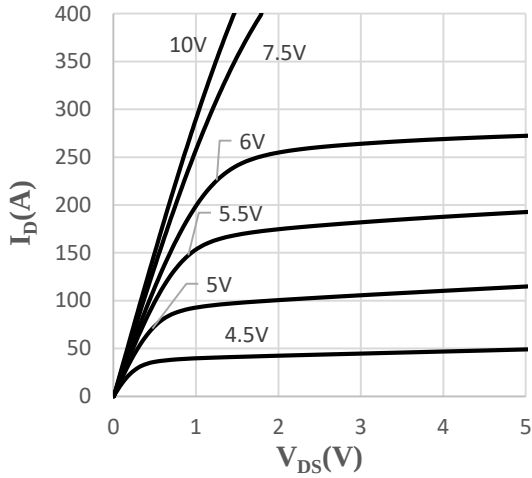


Fig 1 Typical Output Characteristics

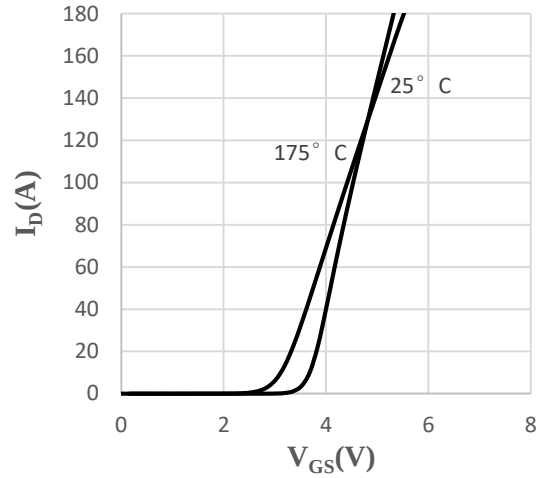


Fig 2 Transfer Characteristics

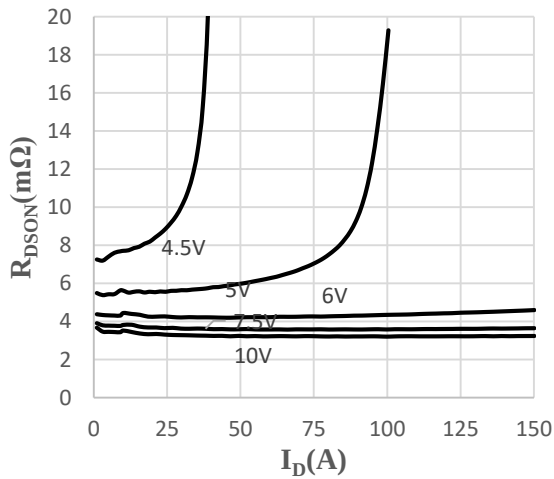


Fig 3 Drain-source on resistance

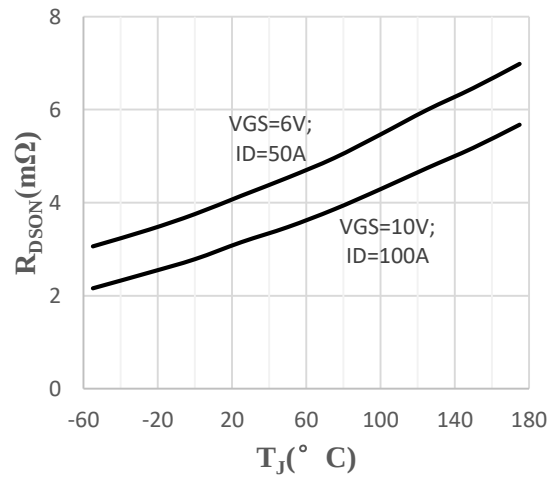


Fig 4 On-Resistance vs. Junction Temperature

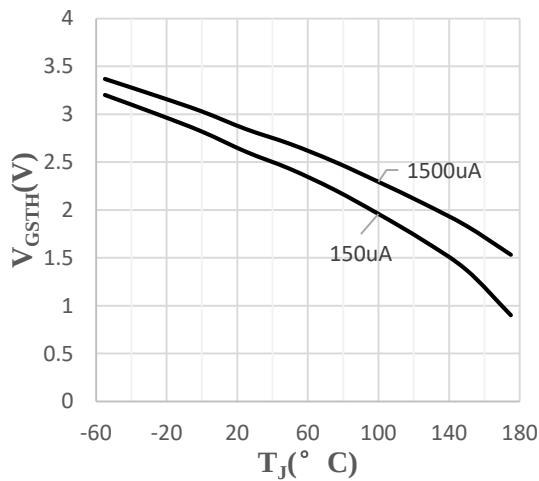


Fig 5 Gate Voltage vs. Junction Temp

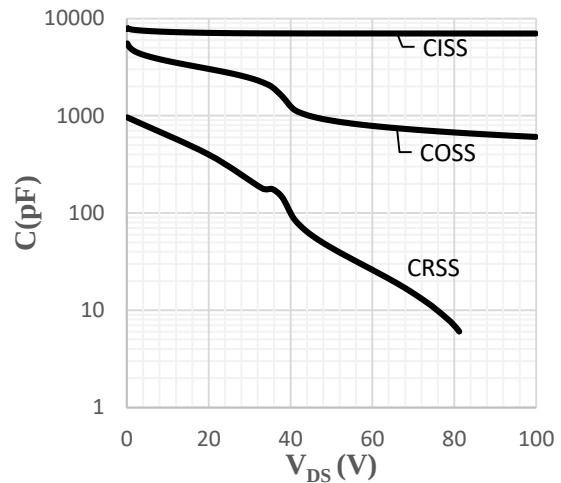


Fig 6 Capacitance Characteristics

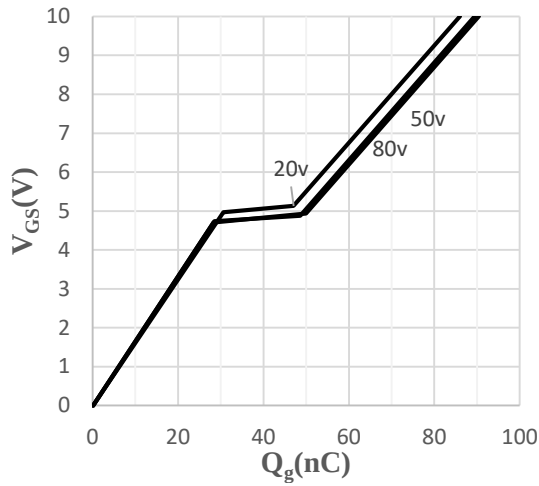


Fig 7 Gate-Charge Characteristics

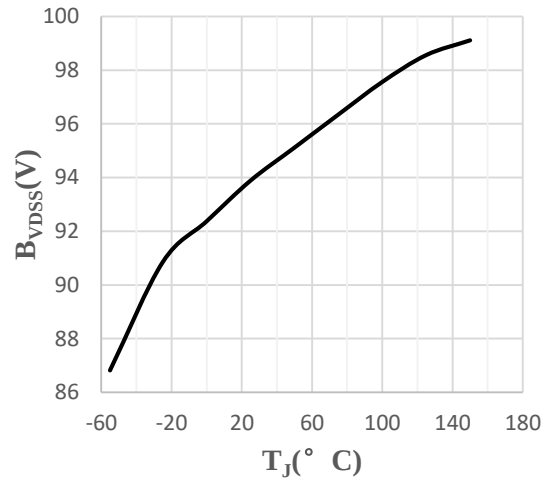


Fig 8 Drain-Source breakdown voltage

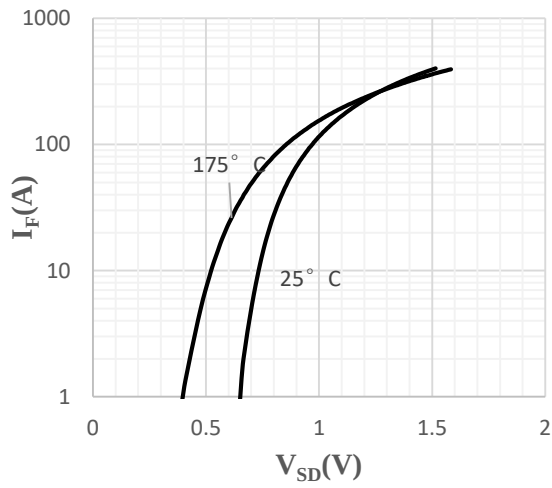


Fig 9 Forward characteristics of reverse diode

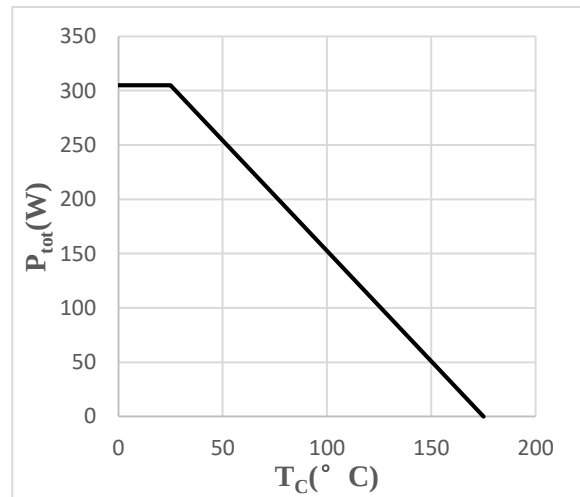


Fig 10 Power dissipation

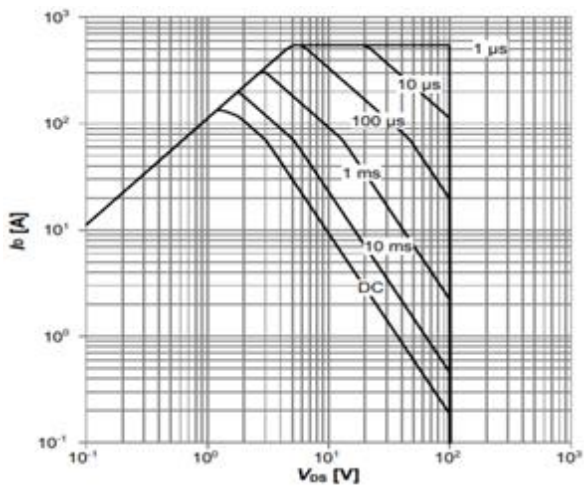


Fig 11 Safe operating area

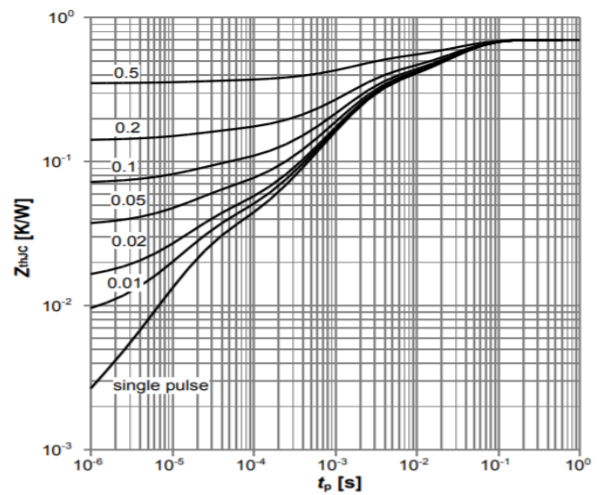
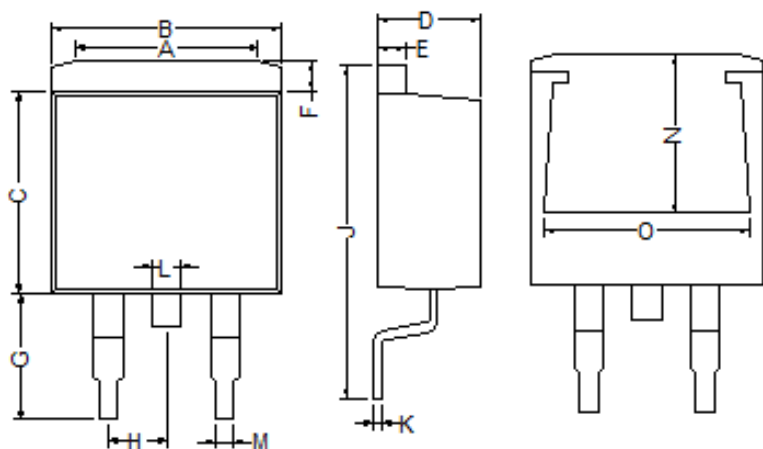


Fig 12 transient thermal impedance

Package Outline Dimensions (Unit: mm)



TO-263		
Dimension	Min.	Max.
A	6.00	8.00
B	9.90	10.30
C	8.50	9.10
D	4.37	4.77
E	1.07	1.47
F	1.07	1.47
G	5.05	5.74
H	2.44	2.66
J	15.15	15.80
K	0.28	0.48
L	1.17	1.37
M	0.71	0.91
N	6.55	7.68
O	7.70	8.10

Mounting Pad Layout (Unit: mm)

TO-263

