

Features

- N-channel, normal level
- Excellent FOM
- Very low on-resistance $R_{DS(on)}$
- Ideal for high-frequency switching and synchronous rectification
- JESD22-A114-B ESD rating of class 1C per human body model

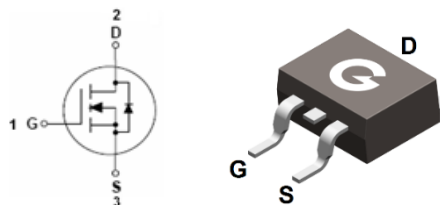
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Mechanical Data

- 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}	100	V
$R_{DS(on)}, \max @ 10V$	3.7	m Ω
$Q_{g, typ} @ 10V$	118	nC



TO-263

Ordering Information

Part Number	Package	Shipping Quantity	Marking Code
BL037N10THB	TO-263	50 pcs / Tube & 800 pcs / Tape & Reel	037N10THB

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	160	A
Continuous Drain Current ($T_C = 25^\circ\text{C}$, Package Limited)		120	A
Continuous Drain Current ($T_C = 100^\circ\text{C}$)		110	A
Pulsed Drain Current ($t_p = 10\mu\text{s}$, $T_C = 25^\circ\text{C}$)	I_{DM}	480	A
Single Pulse Avalanche Energy ^{*3}	E_{AS}	266	mJ

Thermal Characteristics

Parameter	Symbol	Value	Unit
Power Dissipation ($T_C = 25^\circ\text{C}$)	P_D	208	W
Thermal Resistance Junction-to-Air ^{*1}	$R_{\theta JA}$	20	$^\circ\text{C/W}$
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	0.6	$^\circ\text{C/W}$
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 = 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	-	3.4	3.7	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = 250μA	2	3	4	V
R _G	Gate resistance	V _{GS} = 0V, f = 1MHz	-	3	-	Ω
Dynamic Characteristics						
C _{ISS}	Input Capacitance	V _{GS} = 0V	-	7087		pF
C _{OSS}	Output Capacitance	V _{DS} = 50V	-	916		
C _{RSS}	Reverse Transfer Capacitance	f = 100kHz	-	19	-	
t _{d(ON)}	Turn-on Delay Time	V _{DD} =50V	-	35	-	ns
t _r	Turn-on Rise Time	V _{GS} = 10V	-	18	-	
t _{d(OFF)}	Turn-Off Delay Time	R _G = 1.6Ω	-	45	-	
t _f	Turn-Off Fall Time	I _D = 50A	-	55	-	
Gate charge characteristics						
Q _G	Total Gate-Charge	V _{DD} = 50V	-	118	-	nC
Q _{GS}	Gate to Source Charge	I _D = 100A	-	35	-	
Q _{GD}	Gate to Drain (Miller) Charge	V _{GS} = 10V	-	37	-	
Source-Drain Diode Characteristics						
V _{SD}	Diode Forward Voltage ^{*2}	I _{SD} = 10A, V _{GS} = 0V	-	0.8	1.2	V
t _{rr}	Reverse recovery time	I _F = 30A, V _R = 30V di/dt=100A/μs	-	80	-	ns
Q _{rr}	Reverse recovery charge		-	170	-	nC
I _{RRM}	Reverse recovery current		-	4.1	-	A

Notes:

1. The data tested by surface mounted on a 1 inch² FR-4 board with 20Z copper
2. The data tested by pulsed, pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
3. The E_{AS} data shows Max. rating. The test condition is $V_{DD} = 50V, V_{GS} = 10V, L = 1mH$

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

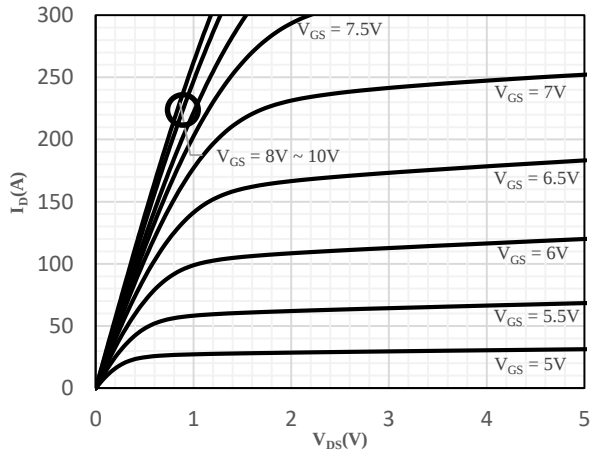
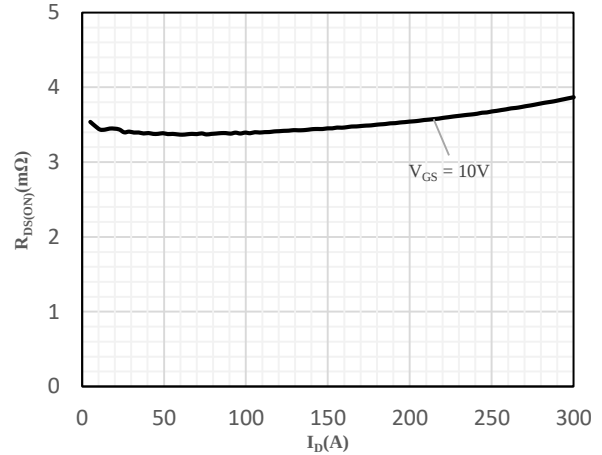


Fig 1 Output Characteristics



**Fig 2 On-Resistance vs. Drain Current
and Gate Voltage**

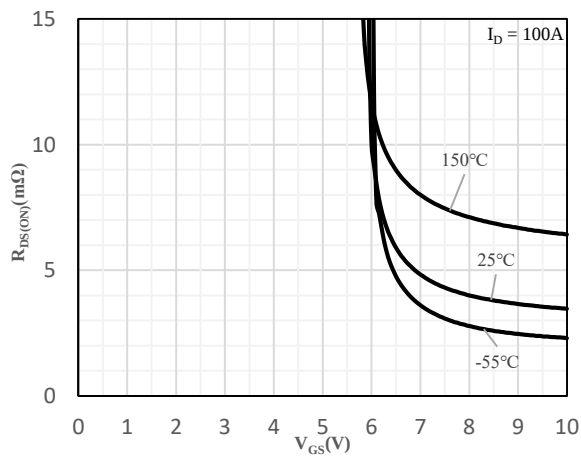


Fig 3 On-Resistance vs. Gate-Source Voltage

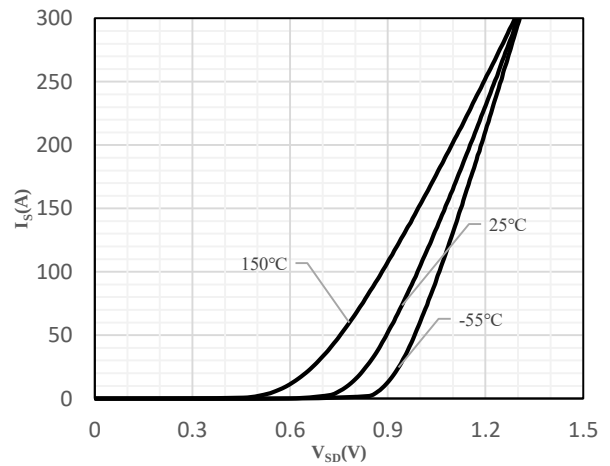
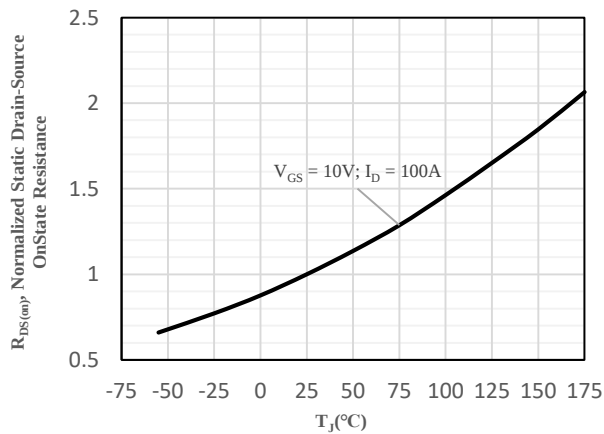
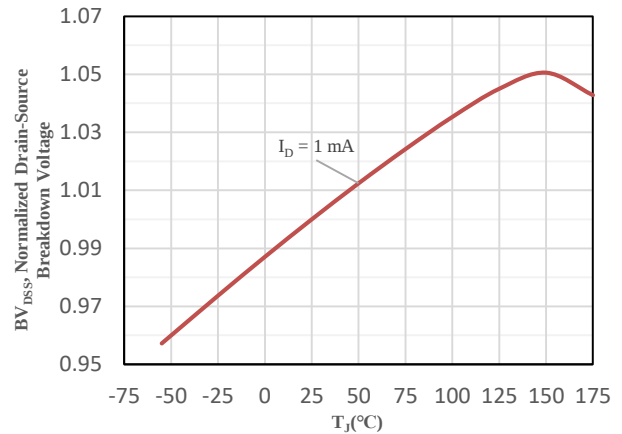


Fig 4 Body-Diode Characteristics



**Fig 5 Normalized On-Resistance vs. Junction
Temperature**



**Fig 6 Normalized Breakdown Voltage vs.
Junction Temperature**

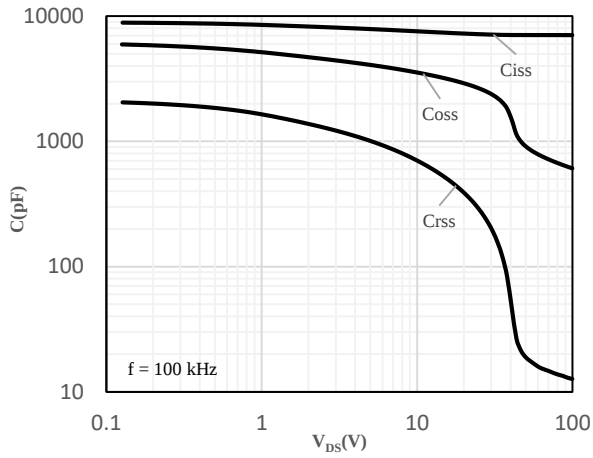


Fig 7 Capacitance Characteristics

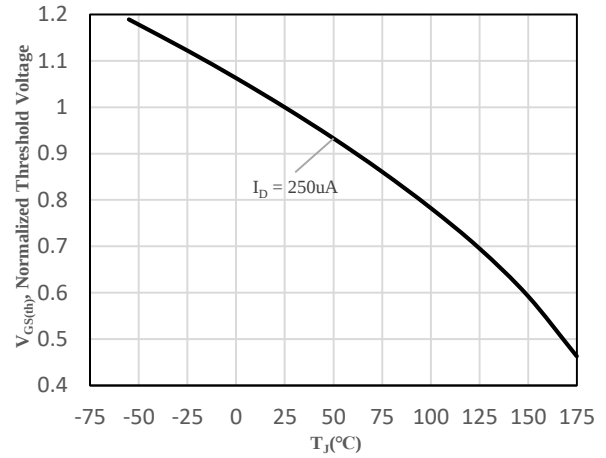


Fig 8 Normalized $V_{GS(th)}$ vs. Junction Temperature

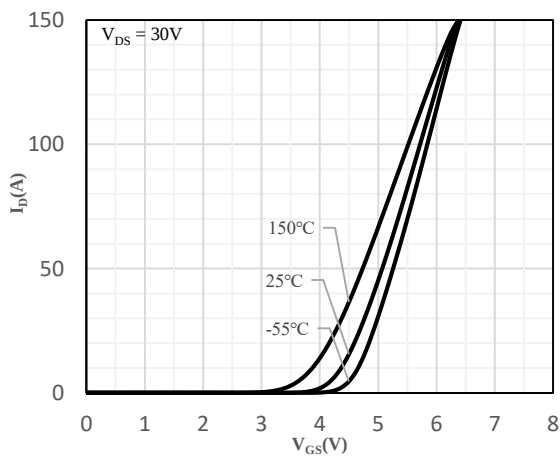


Fig 9 Transfer Characteristics

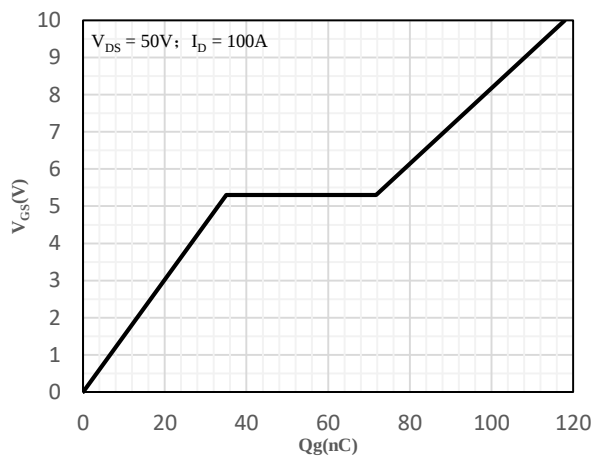


Fig 10 Gate-Charge Characteristics

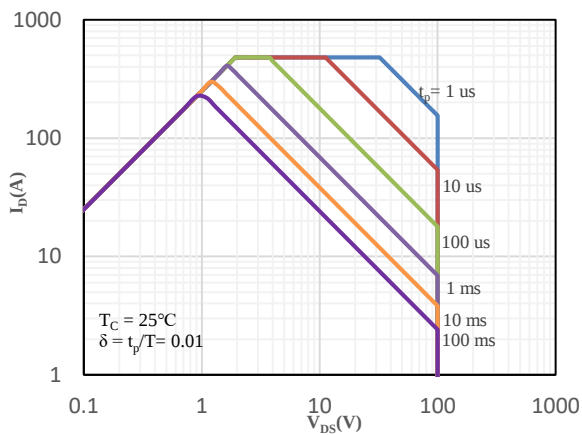


Fig 11 Safe Operation Area

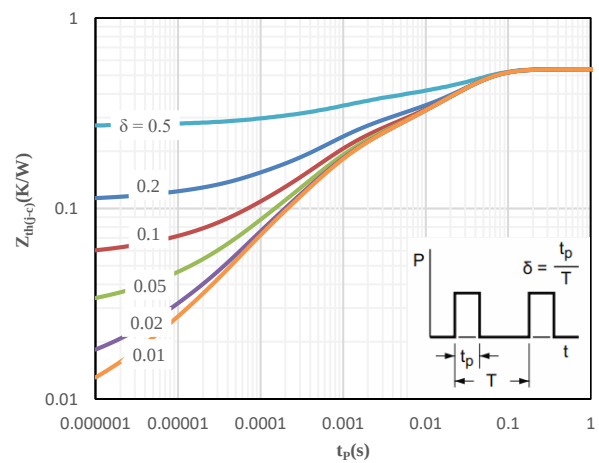
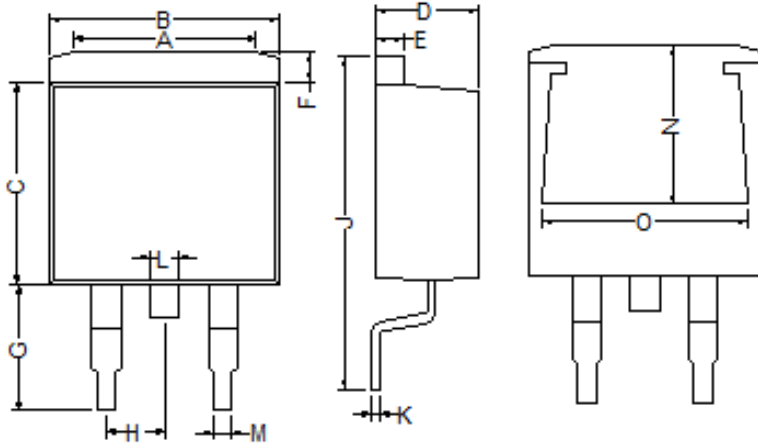


Fig 12 Maximum transient thermal impedance

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

