

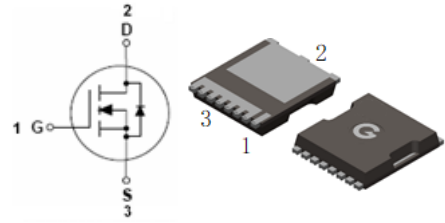
Features

- Ultra-low on-resistance and gate-charge
- Advanced shielded-gate technology

HF

Mechanical Data

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



TOLL

Ordering Information

Part Number	Package	Shipping Quantity	Marking Code
BL014N04T-TL	TOLL	2000 pcs / Tape & Reel	014N04T

Maximum Ratings (@ T_A = 25°C unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain-to-Source Voltage	V _{DSS}	40	V
Gate-to-Source Voltage	V _{GSS}	±20	V
Continuous Drain Current (Package Limited)	I _D	130	A
Continuous Drain Current (T _C = 25°C, Silicon Limited) * ¹		328	A
Continuous Drain Current (T _C = 100°C, Silicon Limited) * ¹		207	A
Pulsed Drain Current * ⁴	I _{DM}	240	A
Single Pulse Avalanche Energy * ⁵	E _{AS}	69	mJ
Avalanche Current * ⁶	I _{AS}	39	A

Thermal Characteristics

Parameter	Symbol	Value	Unit
Power Dissipation (T _C = 25°C)	P _D	250	W
Thermal Resistance Junction-to-Case	R _{θJC}	0.5	°C/W
Thermal Resistance Junction-to-Air * ³	R _{θJA}	45	°C/W
Operating Junction Temperature Range	T _J	-55 ~ +150	°C
Storage Temperature Range	T _{STG}	-55 ~ +150	°C

Electrical Characteristics (@ $T_J = 25^\circ\text{C}$ 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	40	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = 40V, V _{GS} = 0V	-	-	1	μA
I _{GSS}	Gate-Body Leakage Current	V _{GS} = ±20V, V _{DS} = 0V	-	-	±100	nA
On Characteristics						
R _{DS(ON)}	Static Drain-Source On-resistance	V _{GS} = 10V, I _D = 20A	-	1.1	1.4	mΩ
		V _{GS} = 4.5V, I _D = 20A	-	1.4	1.8	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = 250μA	1	1.5	2	V
R _G	Gate Resistance	V _{GS} = 0V, f = 1MHz	-	1.5	-	Ω
Dynamic Characteristics						
C _{ISS}	Input Capacitance	V _{GS} = 0V V _{DS} = 20V f = 150KHz	-	6461	-	pF
C _{OSS}	Output Capacitance		-	3257	-	
C _{RSS}	Reverse Transfer Capacitance		-	196	-	
Switching Characteristics						
t _{d(ON)}	Turn-on Delay Time	V _{DD} = 20V V _{GS} = 4.5V R _G = 3Ω I _D = 20A	-	24	-	ns
t _r	Turn-on Rise Time		-	84	-	
t _{d(OFF)}	Turn-Off Delay Time		-	62	-	
t _f	Turn-Off Fall Time		-	20	-	
Q _G	Total Gate-Charge	V _{DD} = 20V V _{GS} = 4.5V I _D = 20A	-	55	-	nC
Q _{GS}	Gate to Source Charge		-	15	-	
Q _{GD}	Gate to Drain (Miller) Charge		-	19	-	
Source-Drain Diode Characteristics						
V _{SD}	Diode Forward Voltage	I _S = 50A, V _{GS} = 0V	-	0.8	-	V
t _{rr}	Reverse Recovery Time	I _S = 20A, V _{GS} = 0V di/dt = 100A/μs	-	171	-	ns
Q _{rr}	Reverse Recovery Charge		-	381	-	nC

Notes:

1. Rated according to $R_{\theta JC}$
2. Rated according to $R_{\theta JA}$
3. Surface-mounted on 1 inch² FR4 board, 2 oz Cu
4. Limited by maximum T_J
5. Starting $T_J = 25^\circ\text{C}$, $V_{DD} = 30V$, $V_{GS} = 10V$, $L = 0.1mH$
6. Pulse width limited by maximum T_J

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

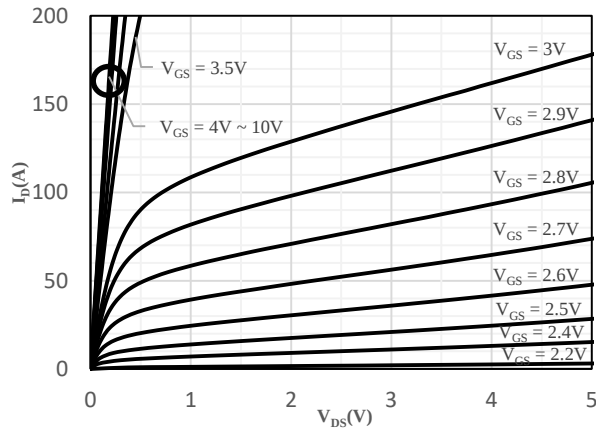


Fig 1 Typical Output Characteristics

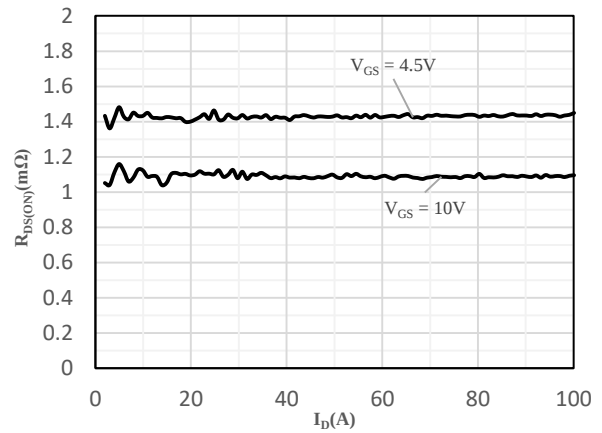


Fig 2 On-Resistance vs. Drain Current and Gate Voltage

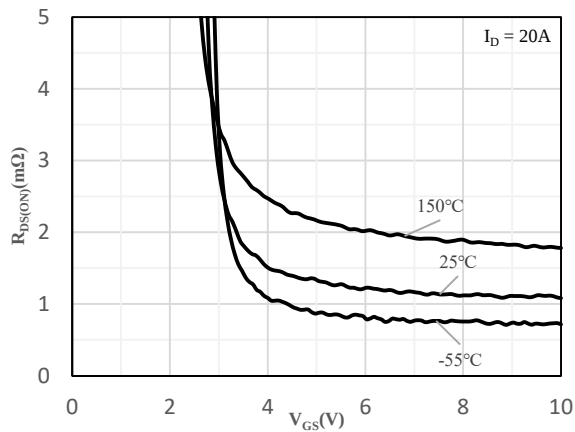


Fig 3 On-Resistance vs. Gate-Source Voltage

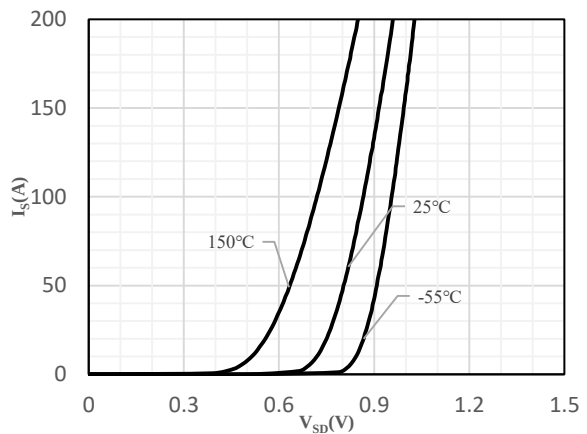


Fig 4 Body-Diode Characteristics

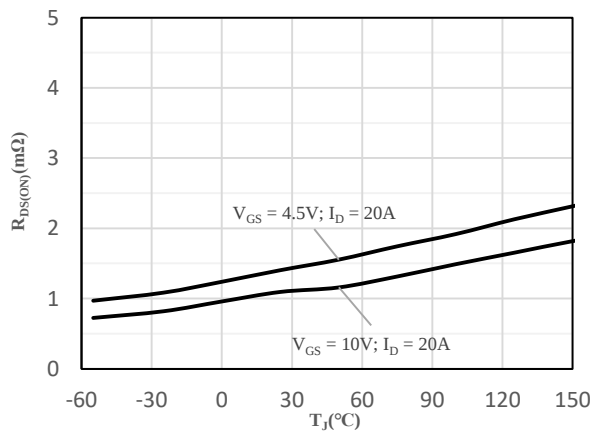


Fig 5 On-Resistance vs. Junction Temperature

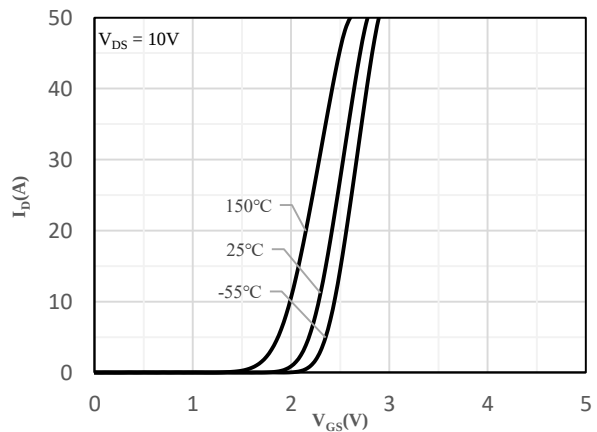


Fig 6 Transfer Characteristics

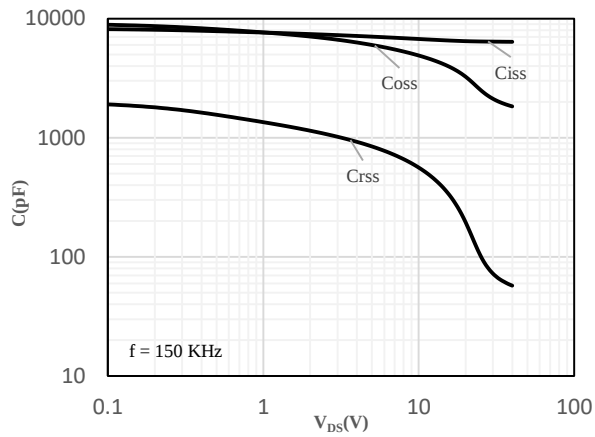


Fig 7 Capacitance Characteristics

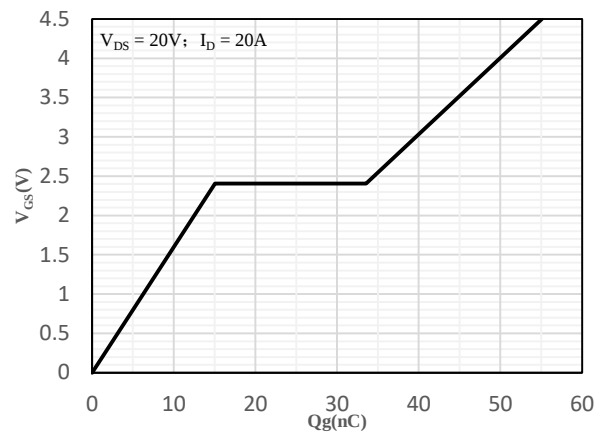


Fig 8 Gate-Charge Characteristics

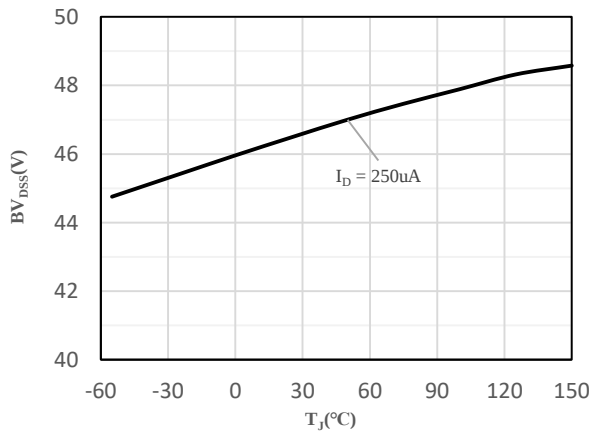


Fig 9 Breakdown Voltage vs.
Junction Temperature

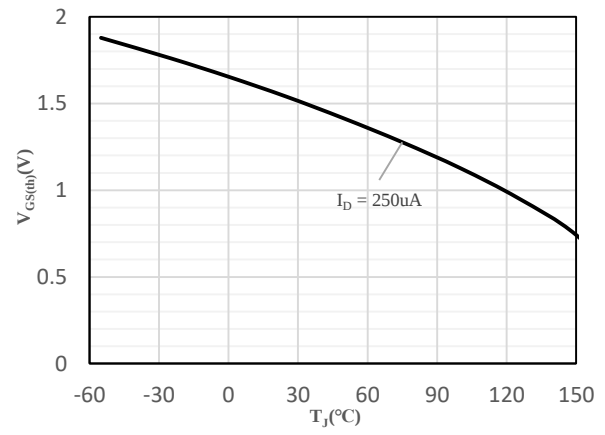
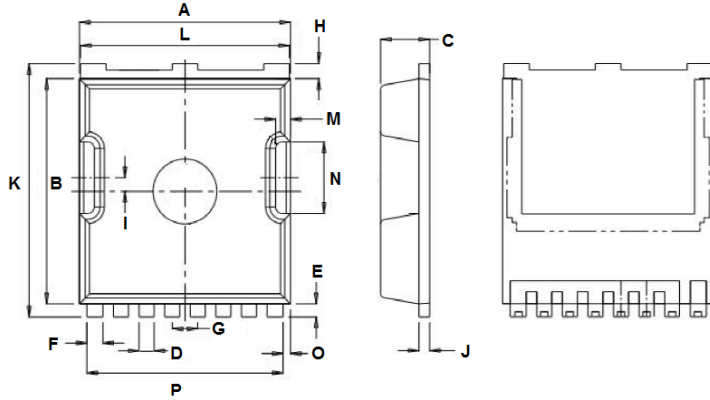


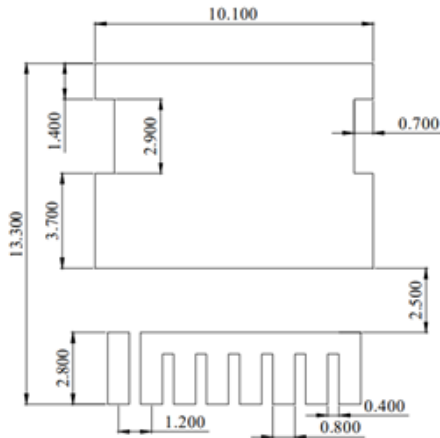
Fig 10 $V_{GS(th)}$ vs. Junction Temperature

Package Outline Dimensions (Unit: mm)



TOLL		
Dimension	Min.	Max.
A	9.70	10.10
B	10.20	10.60
C	2.10	2.50
D	0.60	0.80
E	0.50	0.70
F	0.65	0.85
G	1.10	1.30
H	0.60	0.80
I	0.55	0.75
J	0.45	0.55
K	11.50	11.90
L	9.60	10.00
M	0.50	0.70
N	3.10	3.50
O	0.25	0.45
P	9.00	9.40

SOLDERING FOOTPRINT (Unit: mm)



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