

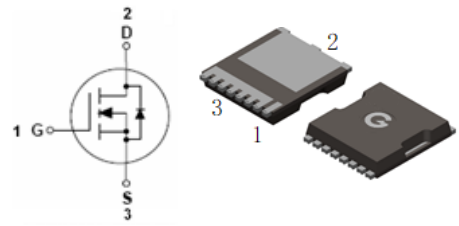
### Features

- Ultra-low on-resistance and gate-charge
- Advanced shielded-gate technology
- JESD22-A114-B ESD rating of class 3A per human body model

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
BL016N10TH-TL	TOLL	2000 pcs / Tape & Reel	016N10TH

### Maximum Ratings

(@ T<sub>A</sub> = 25°C unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain-to-Source Voltage	V <sub>DSS</sub>	100	V
Gate-to-Source Voltage	V <sub>GSS</sub>	±20	V
Continuous Drain Current (T <sub>C</sub> = 25°C)	I <sub>D</sub>	300	A
Continuous Drain Current (T <sub>C</sub> = 100°C)		210	A
Continuous Drain Current (T <sub>A</sub> = 25°C) *1		33	A
Continuous Drain Current (T <sub>A</sub> = 100°C) *1		23	A
Pulsed Drain Current (t <sub>p</sub> = 10μs, T <sub>C</sub> = 25°C)	I <sub>DM</sub>	1200	A
Single Pulse Avalanche Energy *3	E <sub>AS</sub>	3500	mJ
Power Dissipation (T <sub>C</sub> = 25°C)	P <sub>D</sub>	300	W
Operating Junction Temperature Range	T <sub>J</sub>	-55 ~ +175	°C
Storage Temperature Range	T <sub>STG</sub>	-55 ~ +175	°C

### Thermal Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal Resistance Junction-to-Case	R <sub>θJC</sub>	-	0.4	0.5	°C/W
Thermal Resistance Junction-to-Air *1	R <sub>θJA</sub>	-	24	40	°C/W

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

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
<b>Static Characteristics</b>						
$V_{DSS}$	Drain-Source Breakdown Voltage	$V_{GS} = 0V, I_D = 1mA$	100	-	-	V
$I_{DSS}$	Zero Gate Voltage Drain Current	$V_{DS} = 100V, V_{GS} = 0V$	-	-	5	$\mu A$
$I_{GSS}$	Gate-Body Leakage Current	$V_{GS} = \pm 20V, V_{DS} = 0V$	-	-	$\pm 100$	nA
<b>On Characteristics</b>						
$R_{DS(ON)}$	Drain-Source On-resistance <sup>*2</sup>	$V_{GS} = 10V, I_D = 150A$	-	1.3	1.6	m $\Omega$
		$V_{GS} = 6V, I_D = 75A$	-	1.7	2.2	m $\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250\mu A$	2	3	4	V
$R_G$	Gate Resistance	$V_{GS} = 0V, f = 1MHz$	-	2	-	$\Omega$
<b>Dynamic Characteristics</b>						
$C_{ISS}$	Input Capacitance	$V_{GS} = 0V$ $V_{DS} = 50V$ $f = 1MHz$	-	13113	-	pF
$C_{OSS}$	Output Capacitance		-	2167	-	
$C_{RSS}$	Reverse Transfer Capacitance		-	25	-	
<b>Switching Characteristics</b>						
$t_{d(ON)}$	Turn-on Delay Time <sup>*4</sup>	$V_{DD} = 50V$ $V_{GS} = 10V$ $R_G = 1.8\Omega$ $I_D = 100A$	-	20	-	ns
$t_r$	Turn-on Rise Time <sup>*4</sup>		-	13	-	
$t_{d(OFF)}$	Turn-Off Delay Time <sup>*4</sup>		-	49	-	
$t_f$	Turn-Off Fall Time <sup>*4</sup>		-	17	-	
$Q_G$	Total Gate-Charge	$V_{DD} = 50V$ $V_{GS} = 10V$ $I_D = 100A$	-	211	-	nC
$Q_{GS}$	Gate to Source Charge		-	57	-	
$Q_{GD}$	Gate to Drain (Miller) Charge		-	59	-	
<b>Source-Drain Diode Characteristics</b>						
$V_{SD}$	Diode Forward Voltage <sup>*2</sup>	$I_S = 100A, V_{GS} = 0V$	-	0.8	1.2	V
$t_{rr}$	Reverse Recovery Time	$I_F = 40A, V_{GS} = 0V$ $di/dt = 100A/\mu s$	-	118	-	ns
$Q_{rr}$	Reverse Recovery Charge		-	346	-	nC

Notes:

- The data tested by surface mounted on a 1 inch<sup>2</sup> FR-4 board with 2OZ copper
- 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  $V_{DD} = 80V, V_{GS} = 10V, L = 50mH$
- Guaranteed by design, not subject to production

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

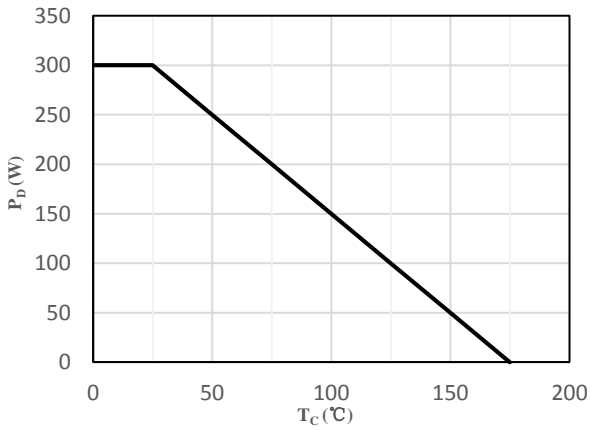


Fig 1 Power Dissipation

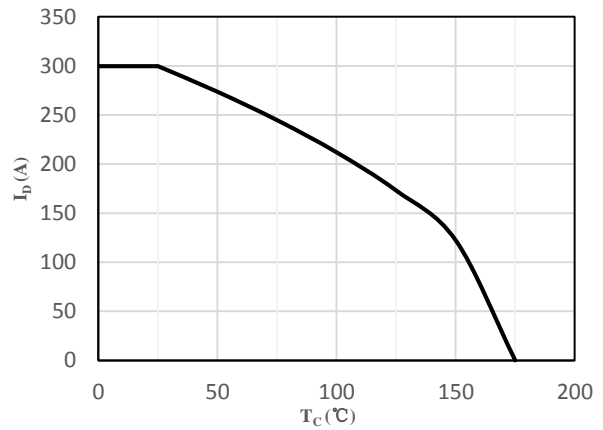


Fig 2 Drain Current

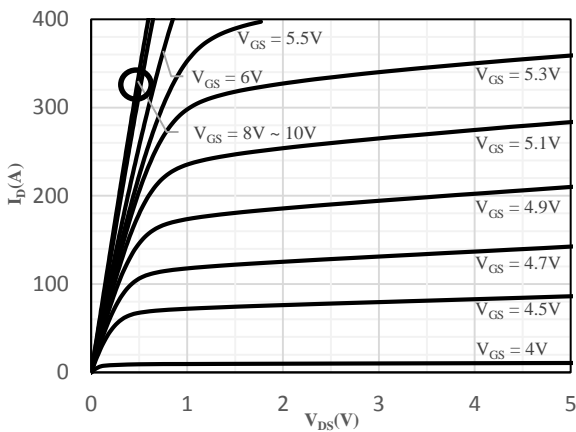


Fig 3 Typical Output Characteristics

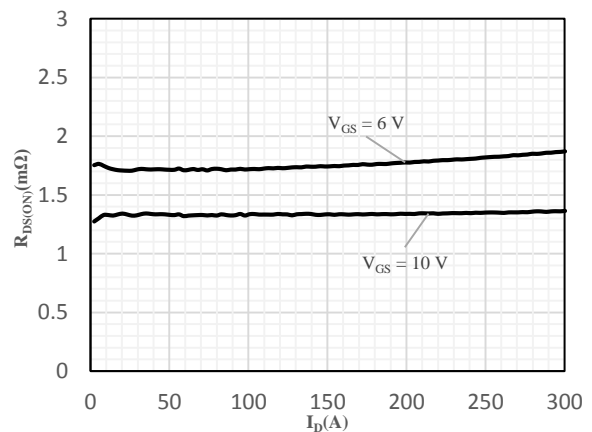


Fig 4 On-Resistance vs. Drain Current and Gate Voltage

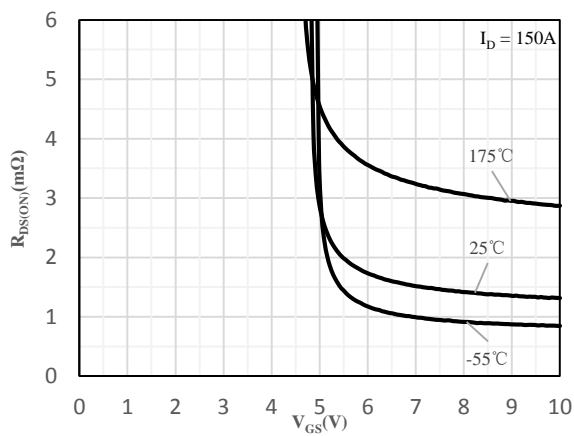


Fig 5 On-Resistance vs. Gate-Source Voltage

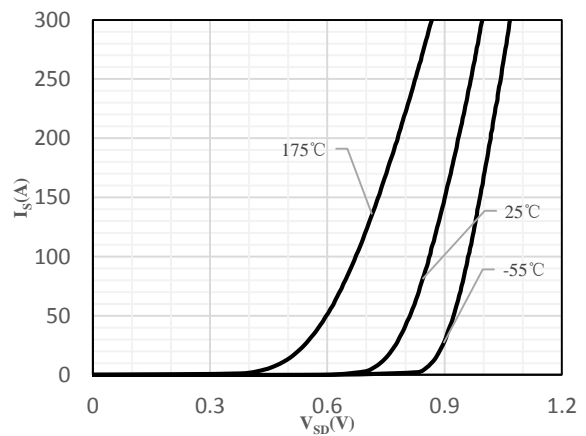


Fig 6 Body-Diode Characteristics

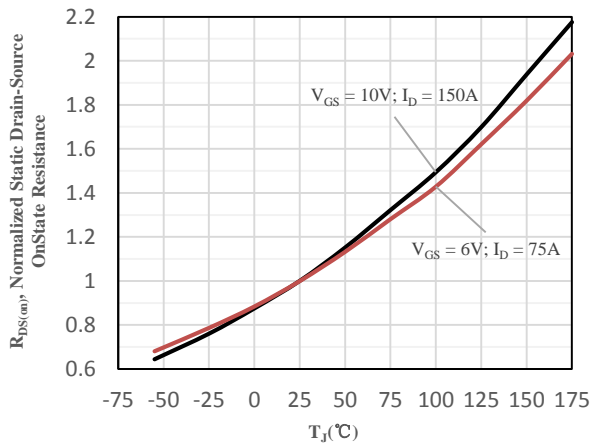


Fig 7 Normalized On-Resistance vs. Junction Temperature

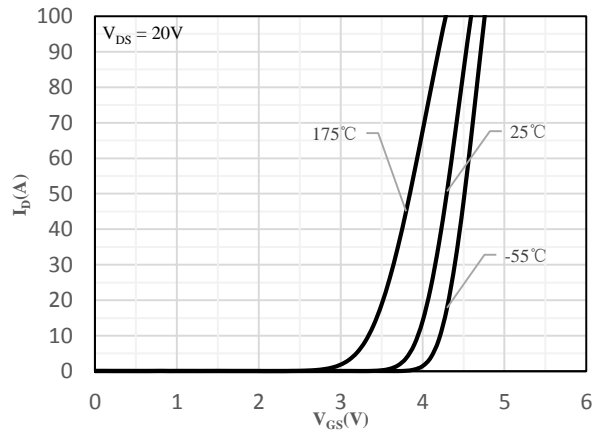


Fig 8 Transfer Characteristics

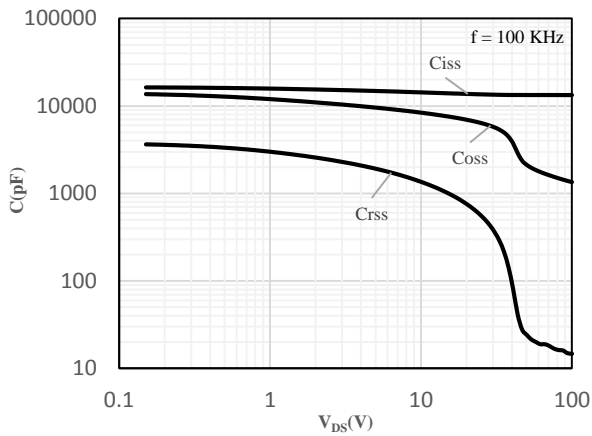


Fig 9 Capacitance Characteristics

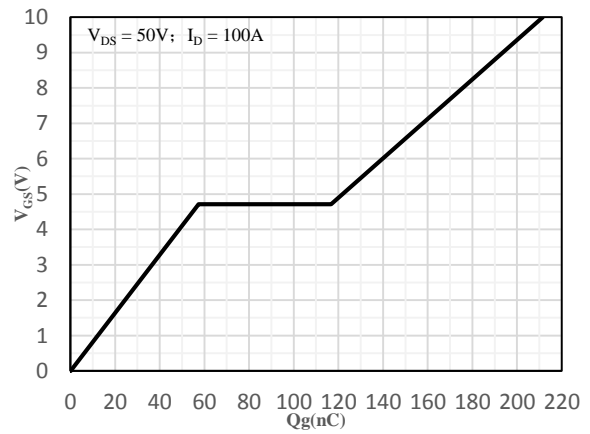


Fig 10 Gate-Charge Characteristics

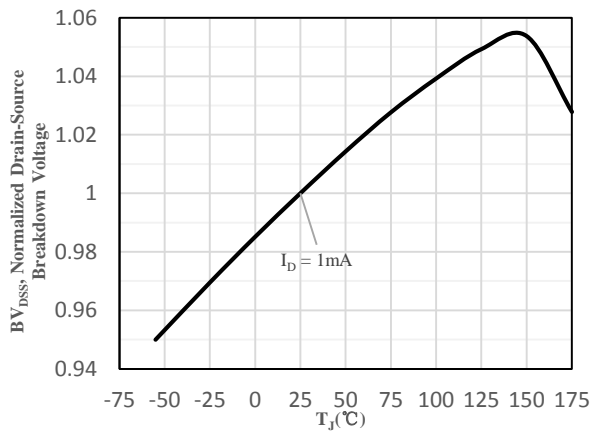


Fig 11 Normalized Breakdown Voltage vs. Junction Temperature

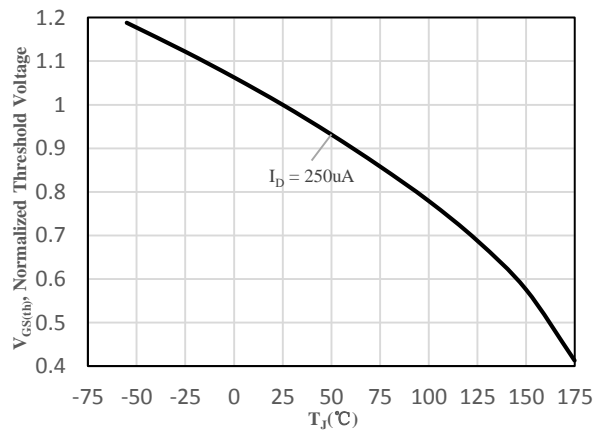


Fig 12 Normalized  $V_{GS(th)}$  vs. Junction Temperature

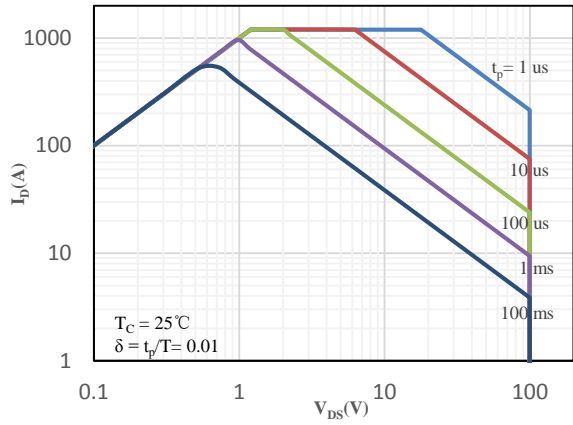


Fig 13 Safe Operation Area

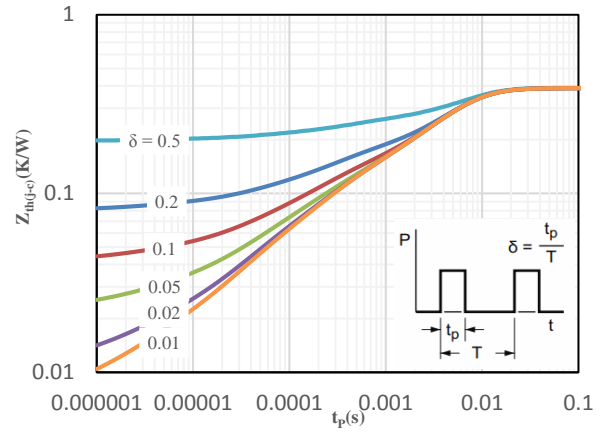
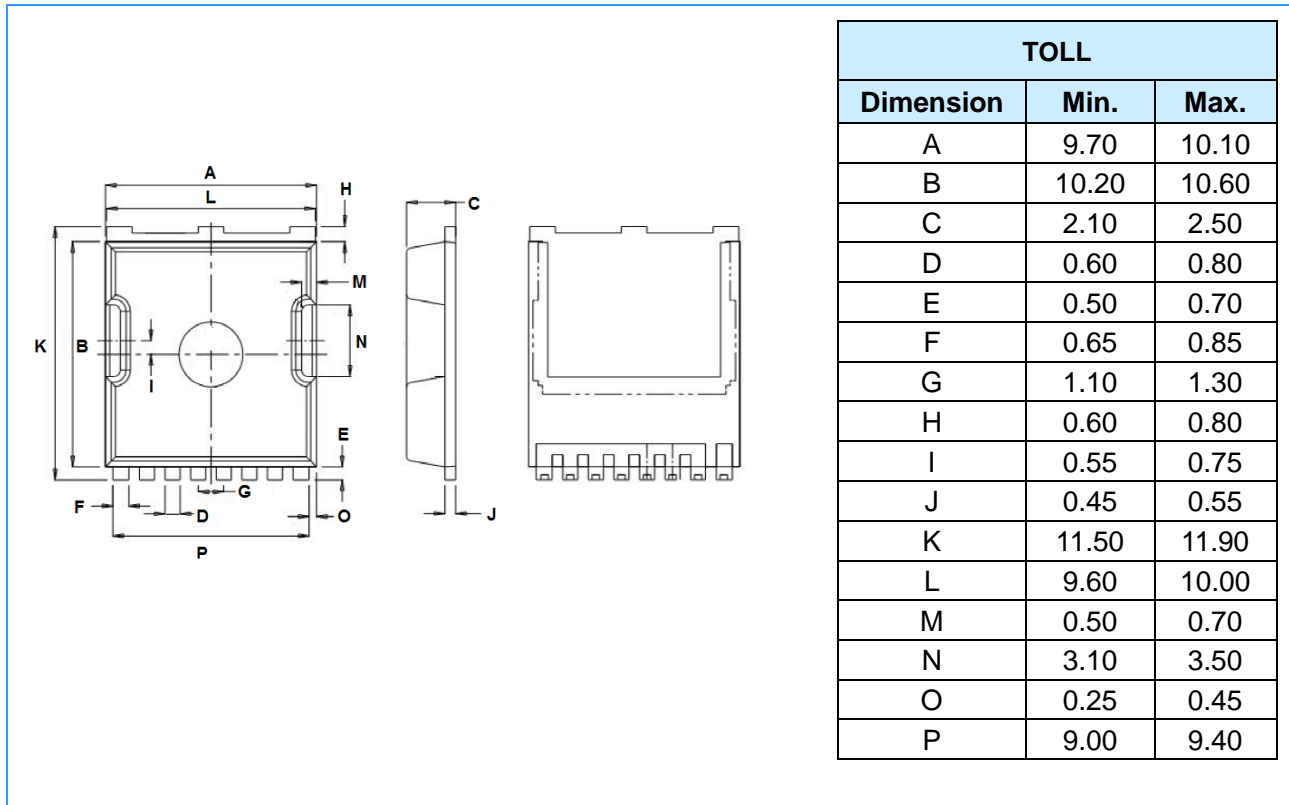
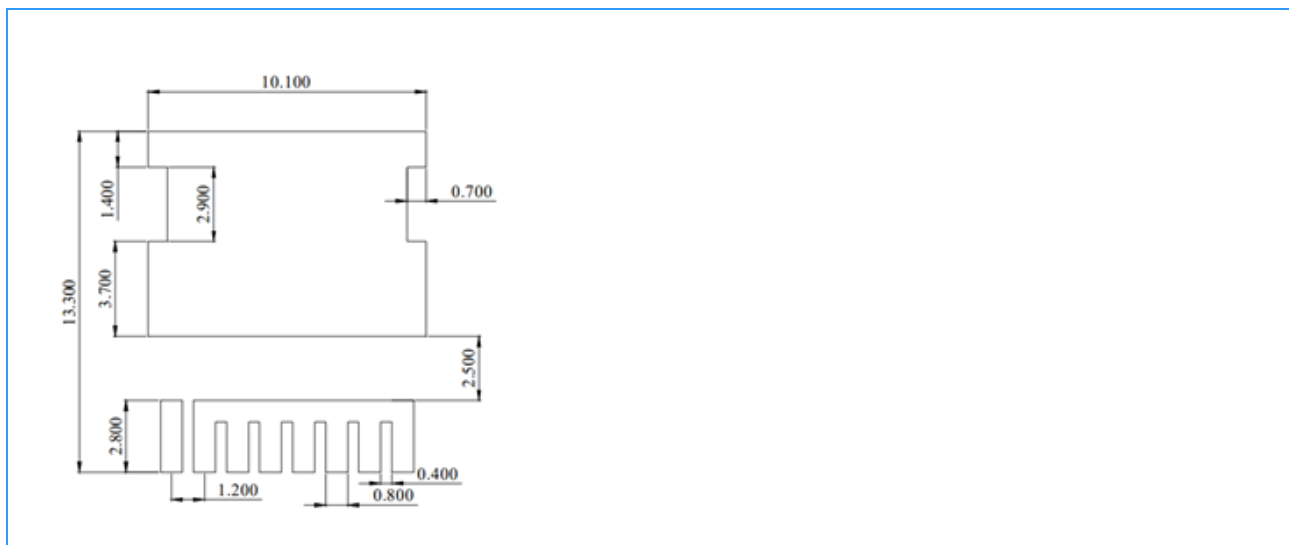


Fig 14 Maximum transient thermal impedance

### Package Outline Dimensions (Unit: mm)



### SOLDERING FOOTPRINT (Unit: mm)



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