

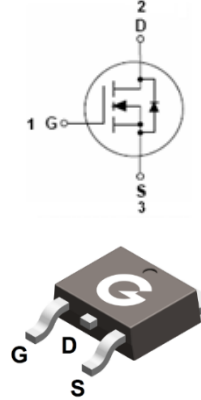
Features

- Super low $R_{DS(on)}$ and gate charge
- Advanced shielded-gate technology
- Green device available
- Excellent c_{dv} / d_t effect decline
- JESD22-A114-B ESD rating of class 1B per human body model

HF

Mechanical Data

- Case: TO-252
- Molding Compound: UL Flammability Classification Rating 94V-0
- Terminals: Matte tin-plated leads; solderability-per MIL-STD-202, Method 208



TO-252

Ordering Information

Part Number	Package	Shipping Quantity	Marking Code
BL027N04TD	TO-252	80 pcs / Tube & 2500 pcs / Tape & Reel	027N04TD

Maximum Ratings (@ $T_A = 25^\circ\text{C}$ 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 ($T_C = 25^\circ\text{C}$, Silicon Limited)	I_D	160	A
Continuous Drain Current ($T_C = 100^\circ\text{C}$)		110	A
Continuous Drain Current ($T_A = 25^\circ\text{C}$) ^{*1}		32	A
Continuous Drain Current ($T_A = 100^\circ\text{C}$) ^{*1}		22	A
Pulsed Drain Current ($t_p = 10\mu\text{s}$, $T_C = 25^\circ\text{C}$)	I_{DM}	640	A
Single Pulse Avalanche Energy ^{*3}	E_{AS}	102	mJ
Power Dissipation ($T_C = 25^\circ\text{C}$)	P_D	150	W
Operating Junction Temperature Range	T_J	$-55 \sim +175$	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	$-55 \sim +175$	$^\circ\text{C}$

Thermal Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	-	0.81	1	$^\circ\text{C/W}$
Thermal Resistance Junction-to-Air ^{*1}	$R_{\theta JA}$	-	20	30	$^\circ\text{C/W}$

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	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 *2	V _{GS} = 10V, I _D = 30A	-	2.2	2.7	mΩ
		V _{GS} = 4.5V, I _D = 30A	-	3.0	3.6	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = 250μA	1	1.6	2.5	V
R _G	Gate Resistance	V _{GS} = 0V, f = 1MHz	-	2.2	-	Ω
Dynamic Characteristics						
C _{ISS}	Input Capacitance	V _{GS} = 0V V _{DS} = 20V f = 1.0MHz	-	2815	-	pF
C _{OSS}	Output Capacitance		-	1100	-	
C _{RSS}	Reverse Transfer Capacitance		-	13	-	
Switching Characteristics						
t _{d(ON)}	Turn-on Delay Time	V _{DD} = 20V V _{GS} = 10V R _G = 3Ω I _D = 20A	-	4	-	ns
t _r	Turn-on Rise Time		-	5	-	
t _{d(OFF)}	Turn-Off Delay Time		-	35	-	
t _f	Turn-Off Fall Time		-	11	-	
Q _G	Total Gate-Charge	V _{DD} = 20V V _{GS} = 10V I _D = 20A	-	50	-	nC
Q _{GS}	Gate to Source Charge		-	8.3	-	
Q _{GD}	Gate to Drain (Miller) Charge		-	8.2	-	
Source-Drain Diode Characteristics						
V _{SD}	Diode Forward Voltage *2	I _{SD} = 1A, V _{GS} = 0V	-	0.6	1.2	V
t _{rr}	Reverse Recovery Time	I _F = 20A, V _{GS} = 0V di/dt = 100A/μs	-	63	-	ns
Q _{rr}	Reverse Recovery Charge		-	73	-	nC

Notes:

1. The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ 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 $V_{DD} = 30V, V_{GS} = 10V, L = 0.1mH$
4. Guaranteed by design, not subject to production

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

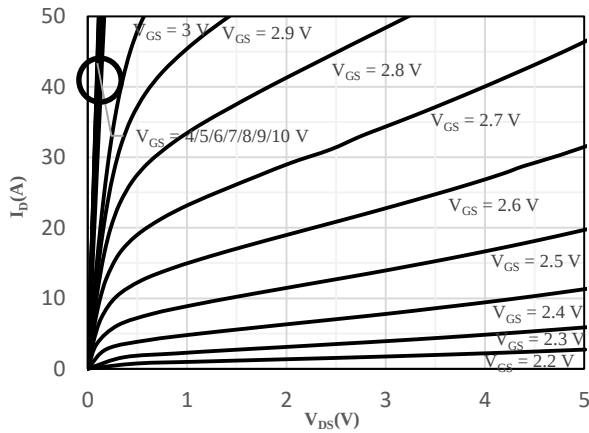


Fig 1 Typical Output Characteristics

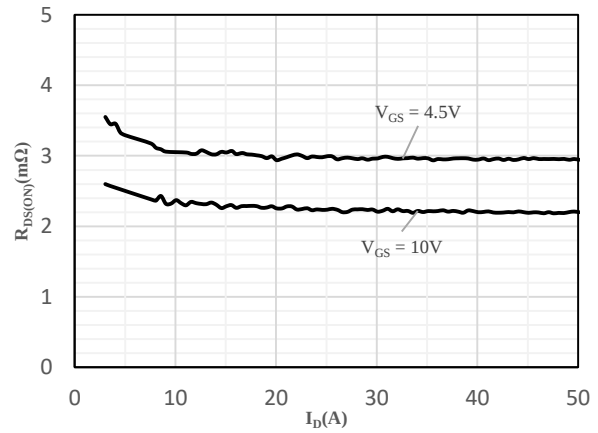


Fig 2 On-Resistance vs. Drain Current and Gate Voltage

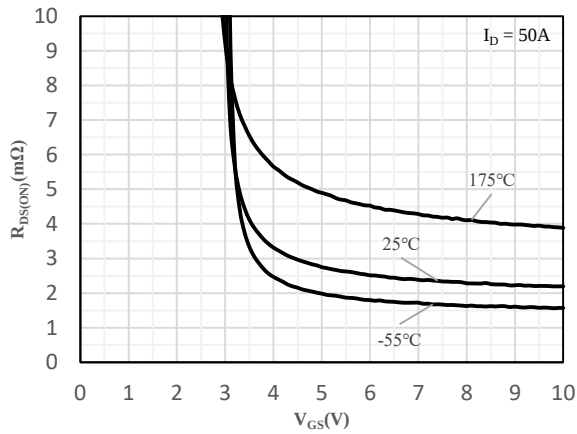


Fig 3 On-Resistance vs. Gate-Source Voltage

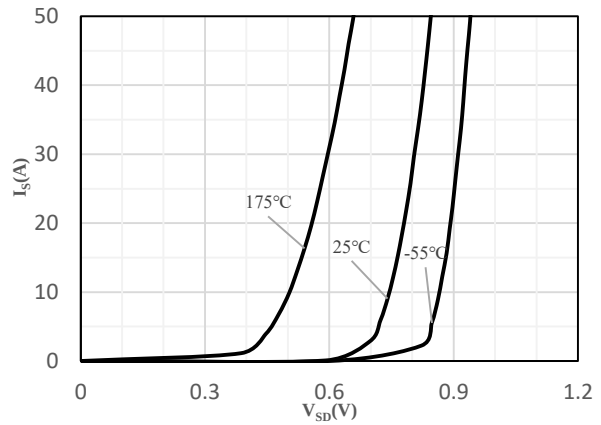


Fig 4 Body-Diode Characteristics

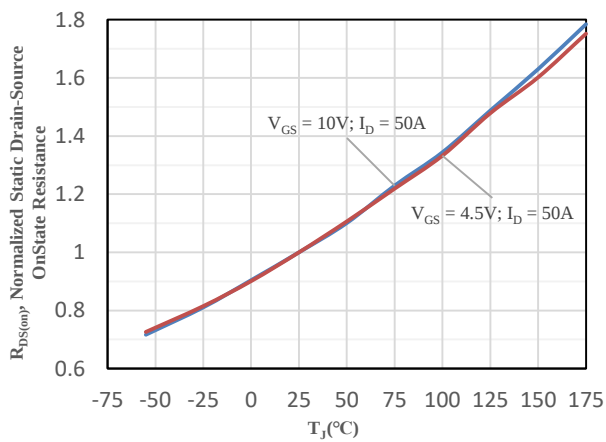


Fig 5 Normalized On-Resistance vs. Junction Temperature

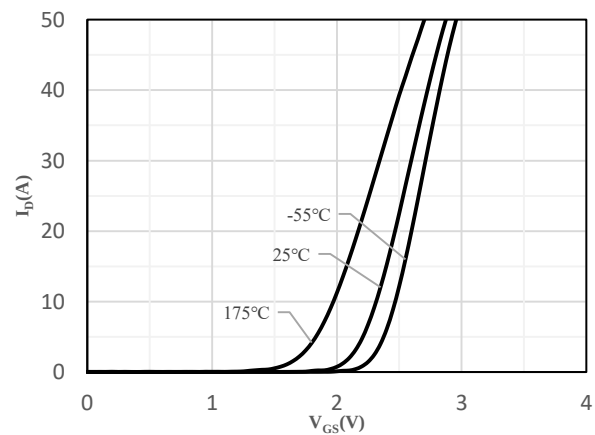


Fig 6 Transfer Characteristics

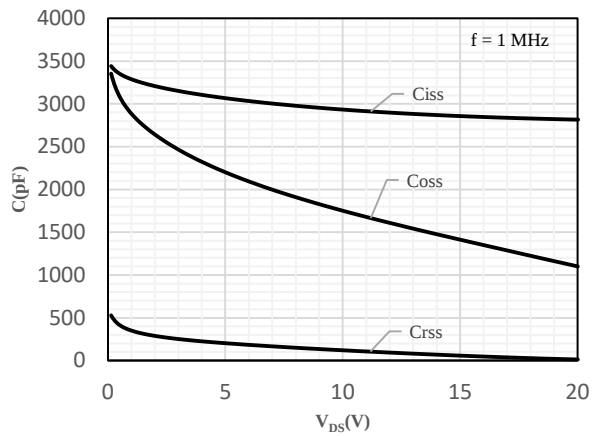


Fig 7 Capacitance Characteristics

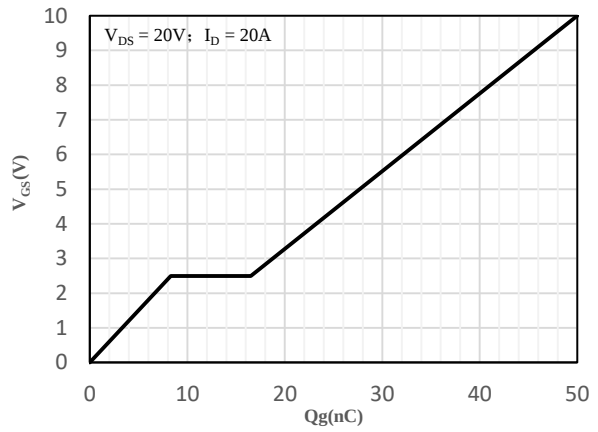


Fig 8 Gate-Charge Characteristics

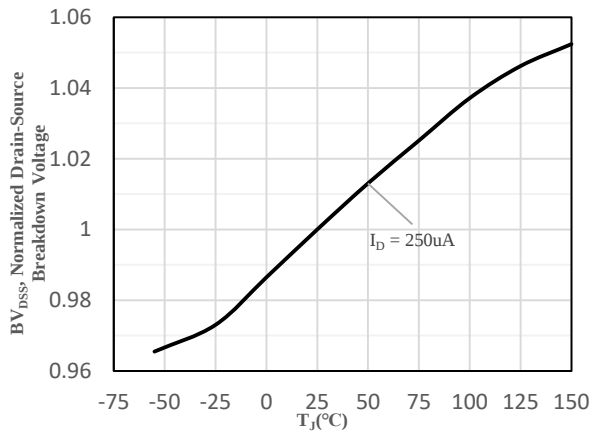


Fig 9 Normalized Breakdown Voltage
vs. Junction Temperature

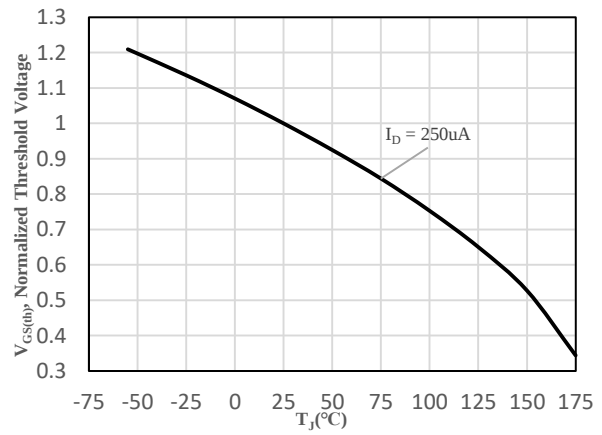


Fig 10 Normalized $V_{GS(th)}$ vs. Junction Temperature

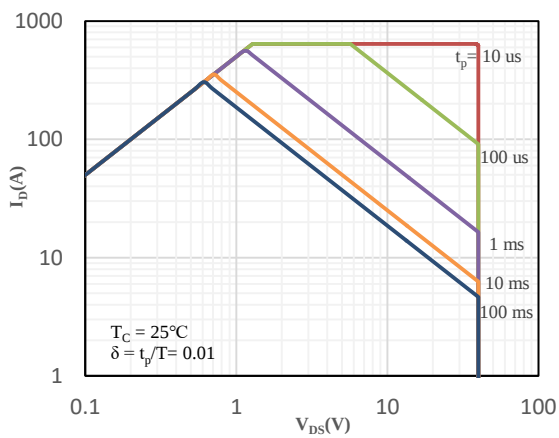


Fig 11 Safe Operation Area

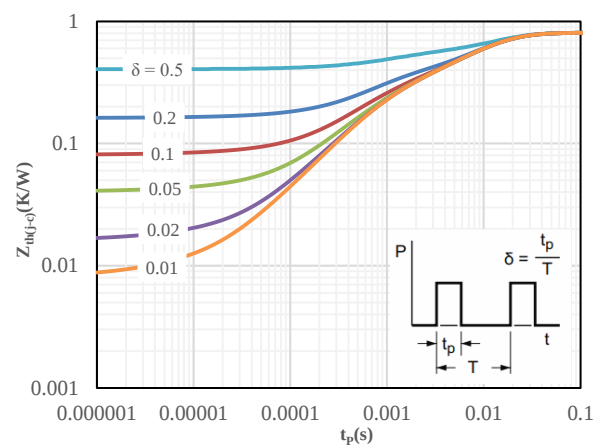
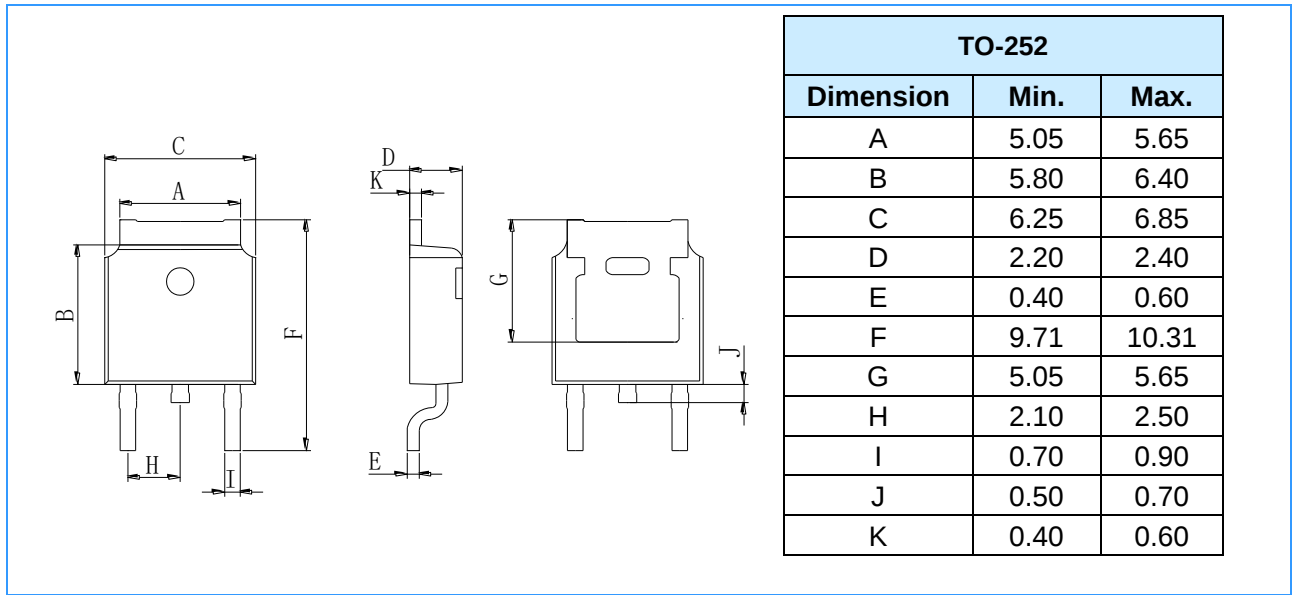
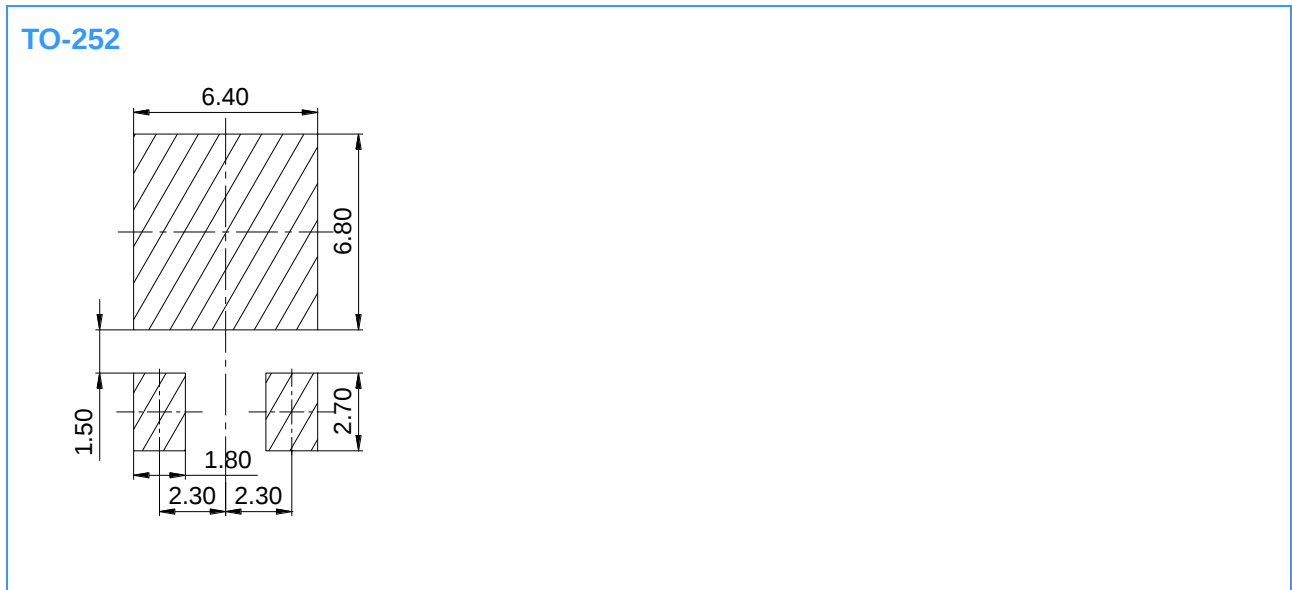


Fig 12 Maximum transient thermal impedance

Package Outline Dimensions (Unit: mm)



Mounting Pad Layout (Unit: mm)



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