

Features

- N-Channel switch with low $R_{DS(on)}$
- Operated at low logic level gate drive
- JESD22-A114-B ESD rating of class 2 per human body model

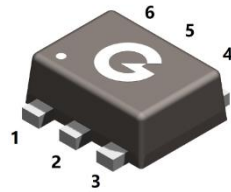
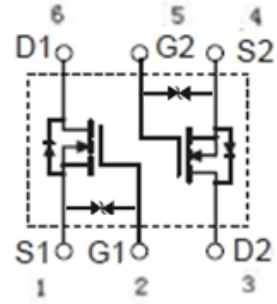
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Typical Applications

- Load/Power Switching
- Interfacing Switching
- Battery Management for Ultra Small Portable Electronics
- Logic Level Shift

Mechanical Data

- Case: SOT-563
- Molding Compound: UL Flammability Classification Rating 94V-0
- Terminals: Matte Tin-Plated Leads, Solderability-per MIL-STD-202, Method 208



SOT-563

Ordering Information

Part Number	Package	Shipping Quantity	Marking Code
BL1012V	SOT-563	3000 pcs / Tape & Reel	1012

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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	20	V
Gate -Source Voltage	V_{GS}	± 10	V
Continuous Drain Current	I_D	0.75	A
Power Dissipation ^{*1}	P_D	0.25	W

Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal Resistance Junction-to-Air ^{*1}	$R_{\theta JA}$	500	$^\circ\text{C/W}$
Thermal Resistance Junction-to-Case ^{*1}	$R_{\theta JC}$	342	$^\circ\text{C/W}$
Thermal Resistance Junction-to-Lead ^{*1}	$R_{\theta JL}$	280	$^\circ\text{C/W}$
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	20	-	-	V
I _{DSS}	Drain to Source Leakage Current	V _{DS} = 20V, V _{GS} = 0V	-	-	1	μA
I _{GSS}	Gate-body Leakage	V _{GS} = ±10V, V _{DS} = 0V	-	-	±10	μA
On Characteristics						
R _{DS(ON)}	Drain-Source On-resistance *2	V _{GS} = 4.5V, I _D = 0.65A	-	-	0.38	Ω
		V _{GS} = 2.5V, I _D = 0.55A	-	-	0.45	
		V _{GS} = 1.8V, I _D = 0.45A	-	-	0.8	
V _{GS(TH)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = 250μA	0.35	0.65	1.1	V
R _G	Gate Resistance	V _{GS} = 0V, f = 1MHz	-	115	-	Ω
Dynamic Characteristics						
C _{ISS}	Input Capacitance	V _{GS} = 0V V _{DS} = 10V f = 1.0MHz	-	67	-	pF
C _{OSS}	Output Capacitance		-	19	-	
C _{RSS}	Reverse Transfer Capacitance		-	6	-	
Switching Characteristics						
t _{d(ON)}	Turn-on Delay Time *3	V _{DD} = 10V, I _D = 0.5A V _{GS} = 4.5V, R _G = 1Ω	-	11	-	ns
t _r	Turn-on Rise Time *3		-	16	-	
t _{d(OFF)}	Turn-Off Delay Time *3		-	26	-	
t _f	Turn-Off Fall Time *3		-	11	-	
Q _G	Total Gate Charge	V _{DD} = 10V	-	2.35	-	nC
Q _{GS}	Gate-Source Charge	I _D = 0.5A	-	0.22	-	
Q _{GD}	Gate-Drain Charge	V _{GS} = 4.5V	-	0.21	-	
Source-Drain Diode Characteristics						
V _{SD}	Diode Forward Voltage *2	I _S = 0.15A, V _{GS} = 0V	-	0.8	1.2	V

Notes:

- 1、 Surface mounted on FR4 board, $t \leq 10$ sec
- 2、 Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$
- 3、 Guaranteed by design, not subject to production

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

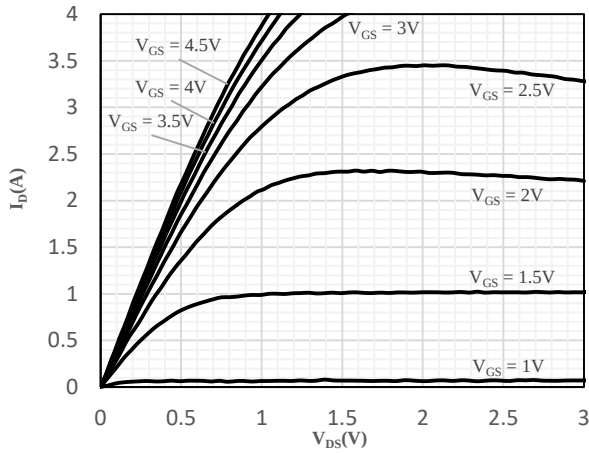


Fig 1 Typical Output Characteristics

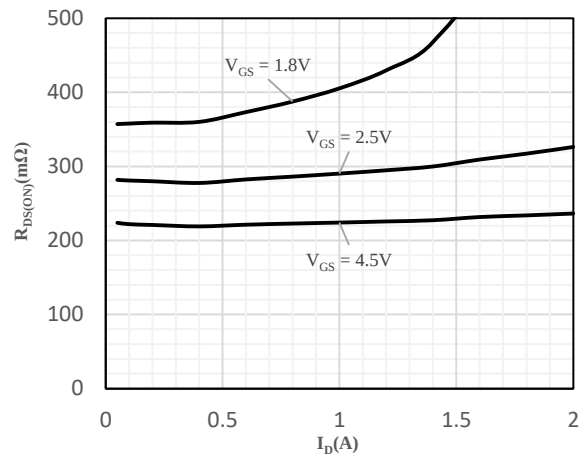


Fig 2 On-Resistance vs. Drain Current and Gate Voltage

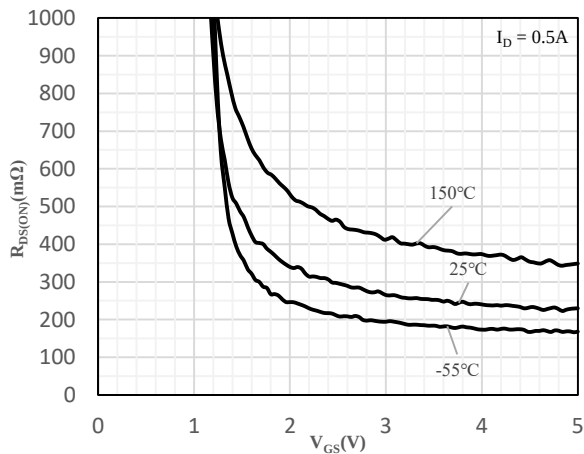


Fig 3 On-Resistance vs. Gate-Source Voltage

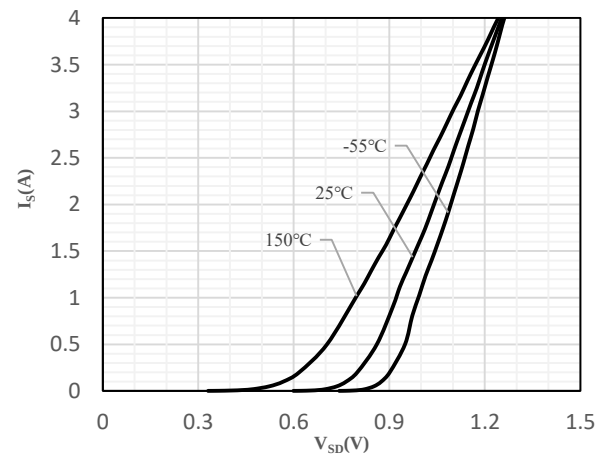


Fig 4 Body-Diode Characteristics

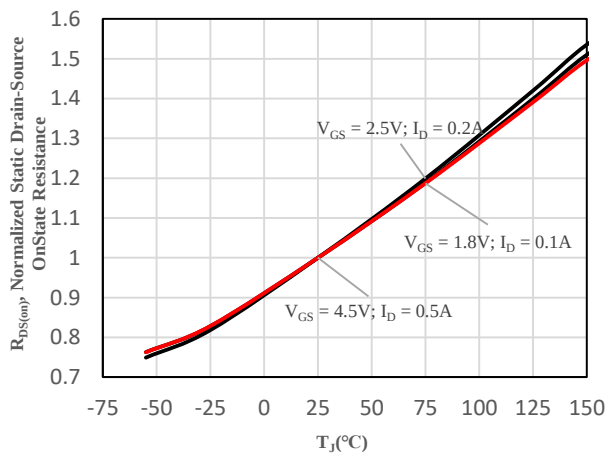


Fig 5 Normalized On-Resistance vs. Junction Temperature

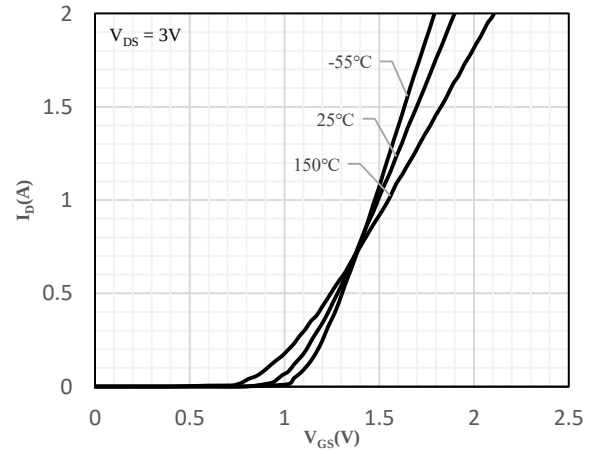


Fig 6 Transfer Characteristics

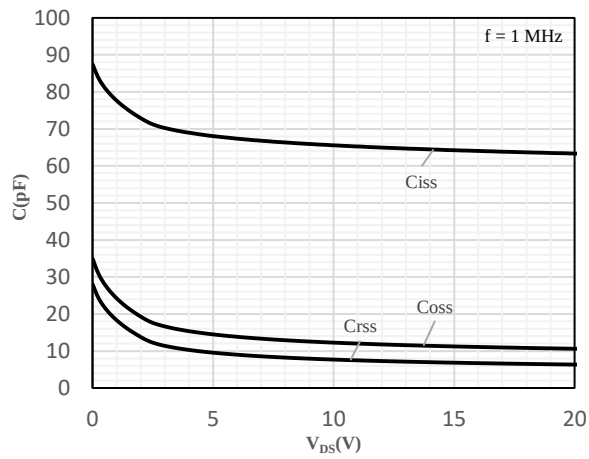


Fig 7 Capacitance Characteristics

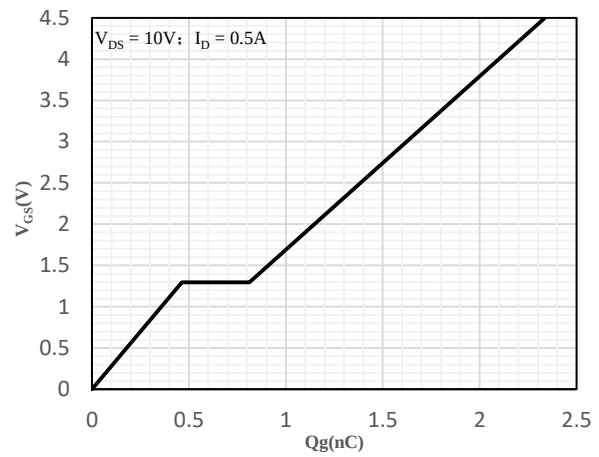


Fig 8 Gate-Charge Characteristics

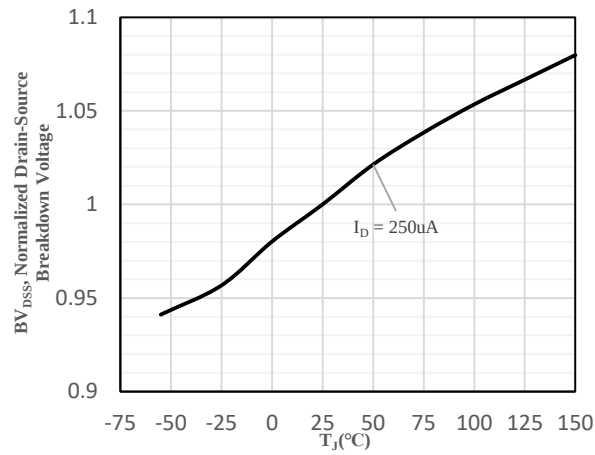


Fig 9 Normalized Breakdown Voltage vs.
Junction Temperature

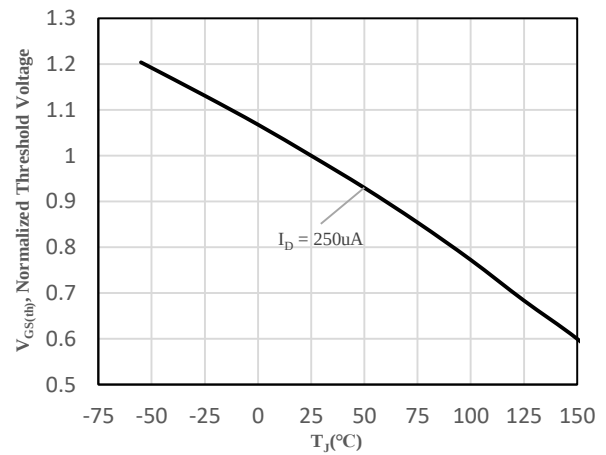
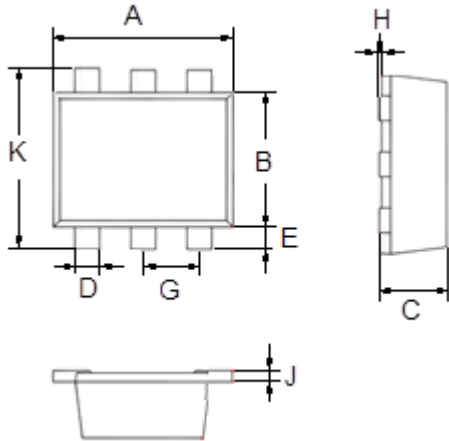


Fig 10 Normalized $V_{GS(th)}$ vs. Junction Temperature

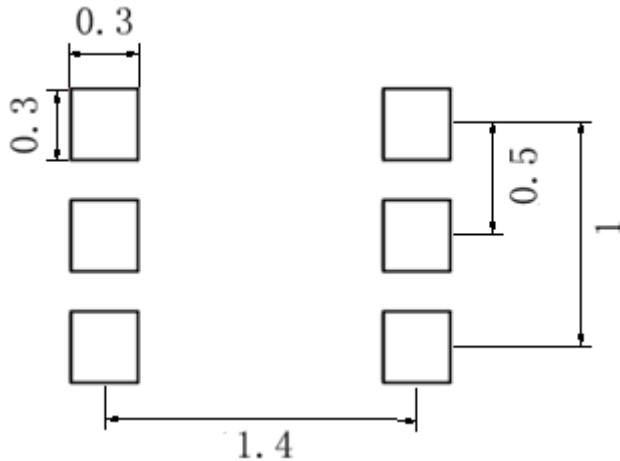
Package Outline Dimensions (Unit: mm)



SOT-563		
Dimension	Min.	Max.
A	1.500	1.700
B	1.100	1.300
C	0.525	0.600
D	0.170	0.270
E	0.100	0.300
G	0.450	0.550
H	0.000	0.050
J	0.090	0.160
K	1.500	1.700

Mounting Pad Layout (Unit: mm)

SOT-563



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