

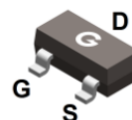
Features

- Low on-resistance
- High-speed switching
- HBM: JESD22-A114-B: 2
- RoHS compliant with Halogen-free

HF

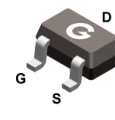
Mechanical Data

- Case: SOT-23, SOT-323, SOT-23-3L
- Molding Compound: UL Flammability Classification Rating 94V-0
- Terminals: Matte Tin-Plated Leads, Solderability-per MIL-STD-202, Method 208



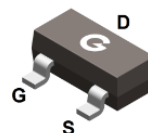
BSS123

SOT-23



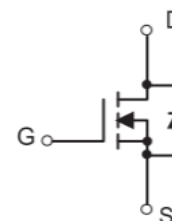
BSS123W

SOT-323



BSS123-3L

SOT-23-3L



Ordering Information

Part Number	Package	Shipping Quantity	Marking Code
BSS123	SOT-23	3000 pcs / Tape & Reel	B123
BSS123W	SOT-323	3000 pcs / Tape & Reel	B123
BSS123-3L	SOT-23-3L	3000 pcs / Tape & Reel	B123

Maximum Ratings (@ T_A = 25°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 _A = 25°C) *1	I _D	170	mA
Continuous Drain Current (T _A = 70°C) *1		135	mA
Pulsed Drain Current (t _p = 10μs, T _A = 25°C)	I _{DM}	680	mA
Single Pulse Avalanche Energy *3	E _{AS}	0.1	mJ
Power Dissipation (T _A = 25°C, SOT-23, SOT-23-3L) *1	P _D	0.35	W
Power Dissipation (T _A = 25°C, SOT-323) *1		0.2	W
Operating Junction Temperature Range	T _J	-55 ~ +150	°C
Storage Temperature Range	T _{STG}	-55 ~ +150	°C

Thermal Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal Resistance Junction-to-Case (SOT-23, SOT-23-3L)	R _{θJC}	-	190	200	°C/W
Thermal Resistance Junction-to-Case (SOT-323)		-	-	300	°C/W
Thermal Resistance Junction-to-Air (SOT-23, SOT-23-3L) *1	R _{θJA}	-	330	357	°C/W
Thermal Resistance Junction-to-Air (SOT-323) *1		-	-	625	°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	100	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = 100V, V _{GS} = 0V	-	-	1	μA
		V _{DS} = 20V, V _{GS} = 0V	-	-	10	nA
I _{GSS}	Gate-Body Leakage Current	V _{GS} = ±20V, V _{DS} = 0V	-	-	±1	μA
On Characteristics						
R _{DS(ON)}	Drain-Source On-resistance *2	V _{GS} = 10V, I _D = 0.17A	-	3.5	6	Ω
		V _{GS} = 4.5V, I _D = 0.17A	-	4.3	10	
V _{GS(TH)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = 250μA	1	1.9	2.8	V
R _G	Gate Resistance	V _{GS} = 0V, f = 1MHz	-	41	-	Ω
Dynamic Characteristics						
C _{ISS}	Input Capacitance	V _{GS} = 0V V _{DS} = 20V f = 1.0MHz	-	37	-	pF
C _{OSS}	Output Capacitance		-	5	-	
C _{RSS}	Reverse Transfer Capacitance		-	2	-	
Switching Characteristics						
t _{d(on)}	Turn-on Delay Time *4	V _{DD} = 30V V _{GS} = 10V I _D = 0.28A R _G = 50Ω	-	8	-	ns
t _r	Turn-on Rise Time *4		-	8	-	
t _{d(off)}	Turn-Off Delay Time *4		-	13	-	
t _f	Turn-Off Fall Time *4		-	16	-	
Q _G	Total Gate-Charge(V _{GS} = 10V)	V _{DD} = 80V V _{GS} = 4.5V I _D = 0.2A	-	4	-	nC
	Total Gate-Charge(V _{GS} = 4.5V)		-	2	-	
Q _{GS}	Gate to Source Charge		-	1.2	-	
Q _{GD}	Gate to Drain (Miller) Charge		-	0.45	-	
Source-Drain Diode Characteristics						
V _{SD}	Diode Forward Voltage *2	I _S = 0.3A, V _{GS} = 0V	-	0.88	1.3	V

Notes:

- The data tested by surface mounted on a minimum recommended FR-4 board
- 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 $V_{DD} = 50V, V_{GS} = 10V, L = 0.1mH$
- Guaranteed by design, not subject to production

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

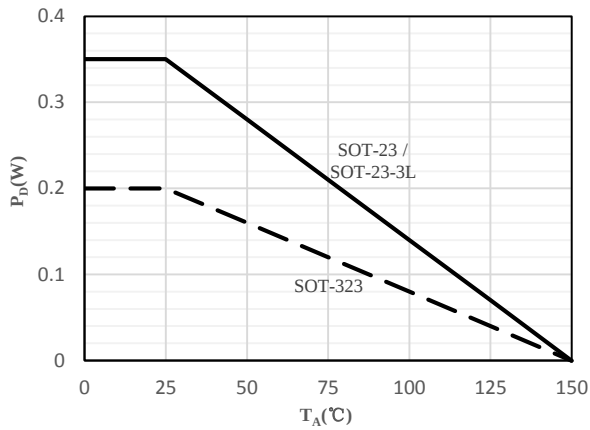


Fig 1 Power Dissipation

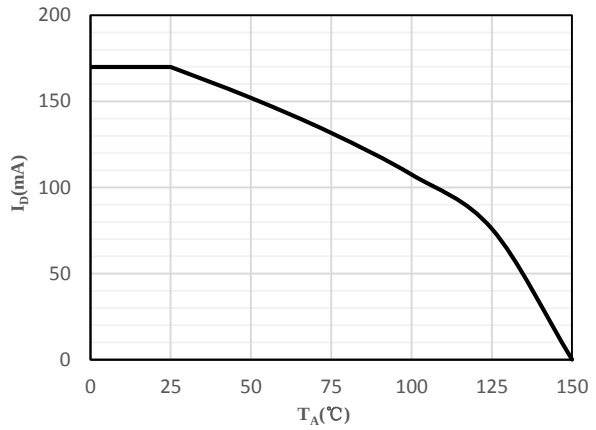


Fig 2 Drain Current

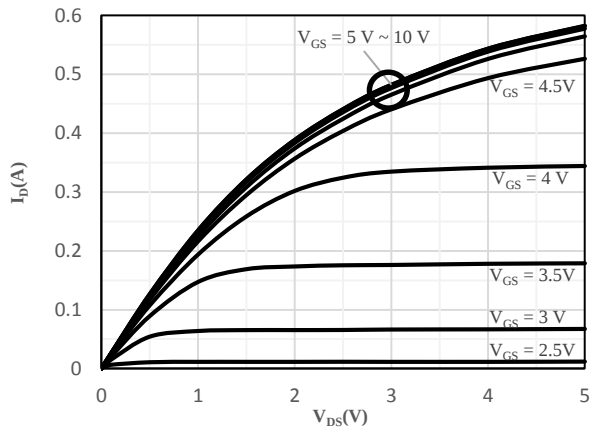


Fig 3 Typical Output Characteristics

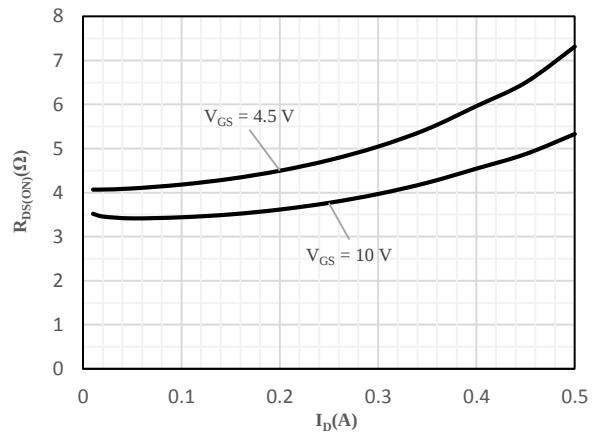


Fig 4 On-Resistance vs. Drain Current and Gate Voltage

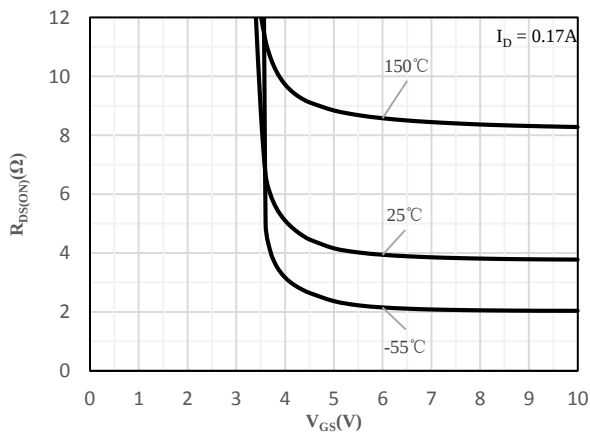


Fig 5 On-Resistance vs. Gate-Source Voltage

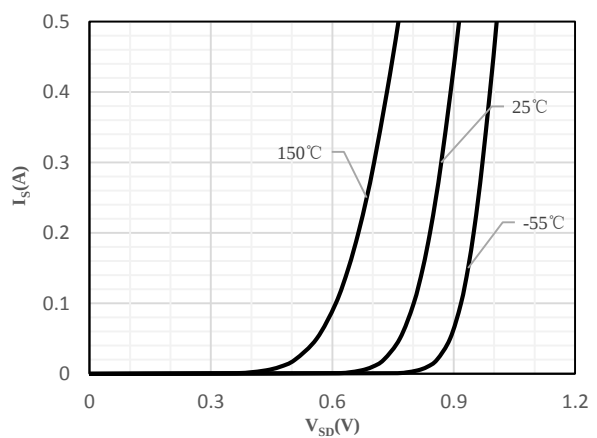


Fig 6 Body-Diode Characteristics

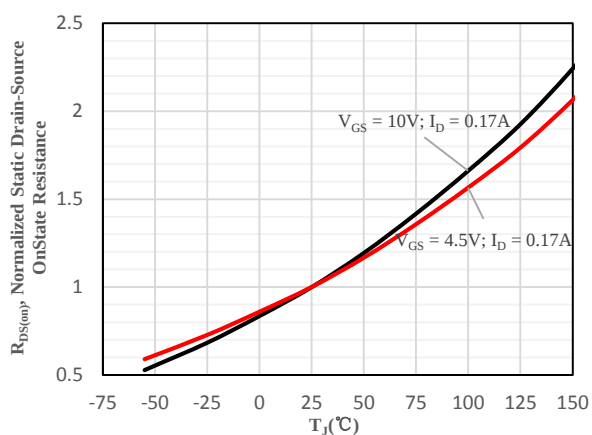


Fig 7 Normalized On-Resistance vs. Junction Temperature

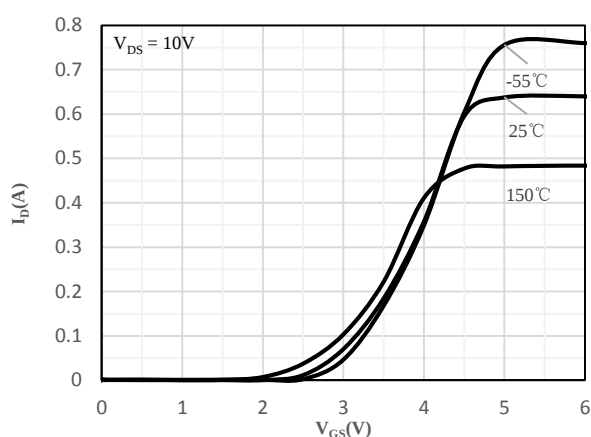


Fig 8 Transfer Characteristics

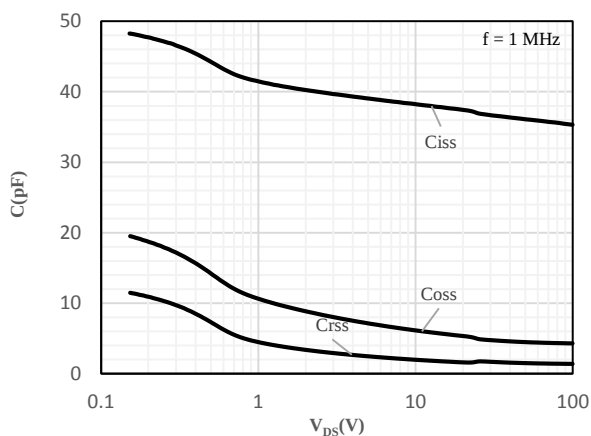


Fig 9 Capacitance Characteristics

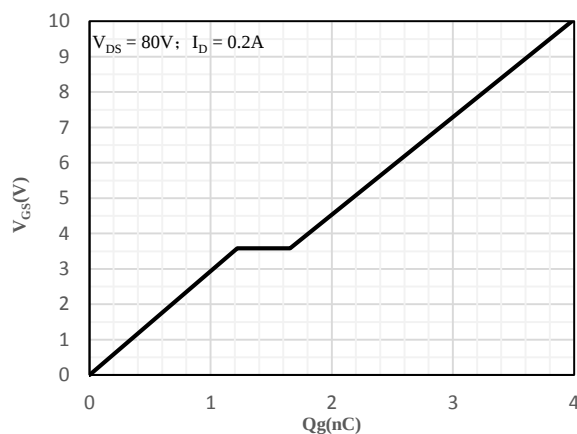


Fig 10 Gate-Charge Characteristics

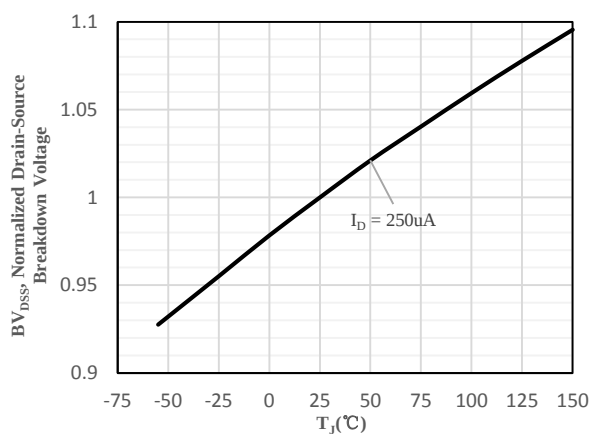


Fig 11 Normalized Breakdown Voltage vs. Junction Temperature

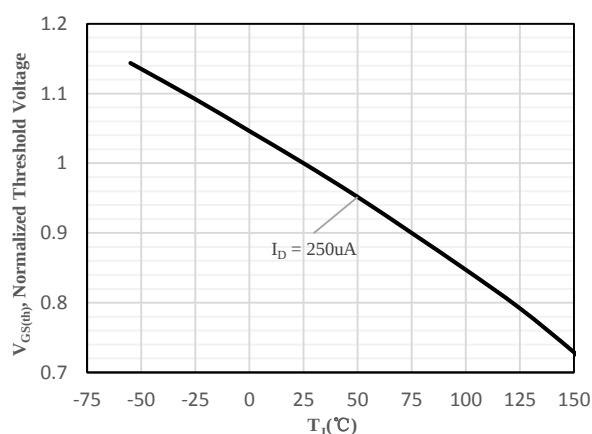
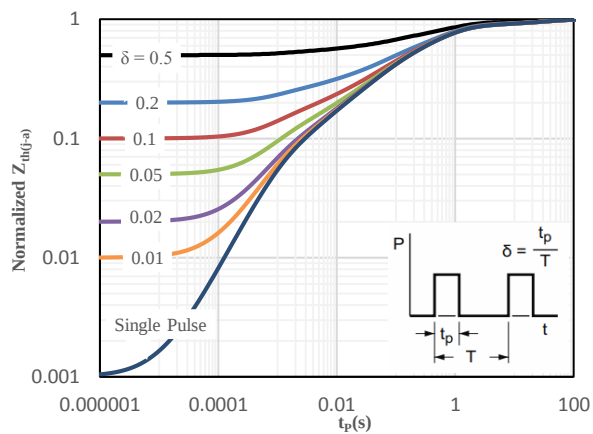
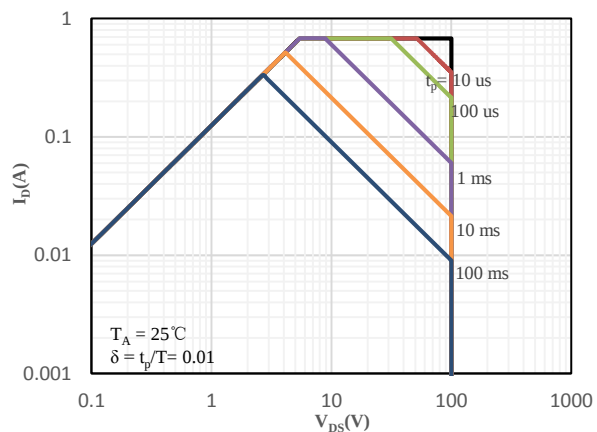
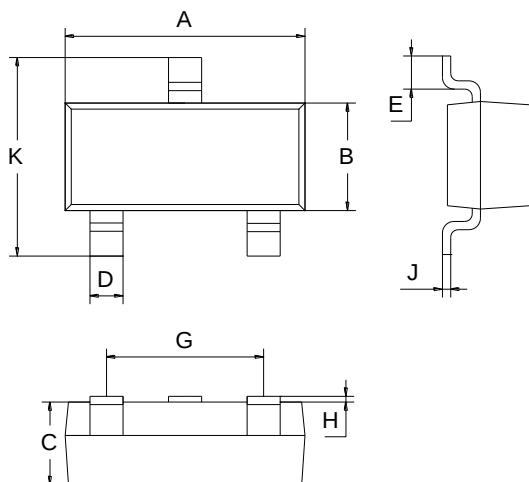


Fig 12 Normalized $V_{GS(th)}$ vs. Junction Temperature



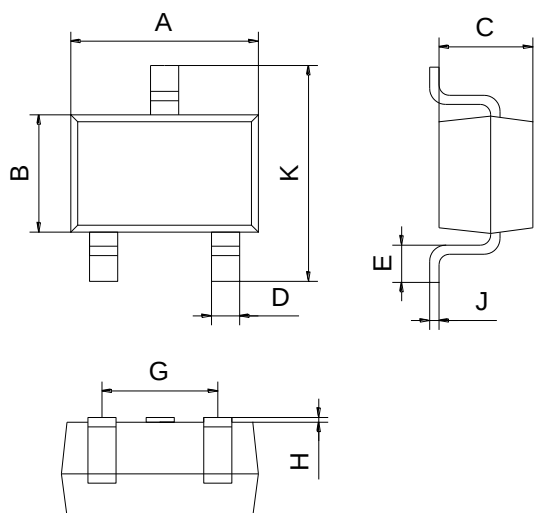
Package Outline Dimensions (Unit: mm)

SOT-23



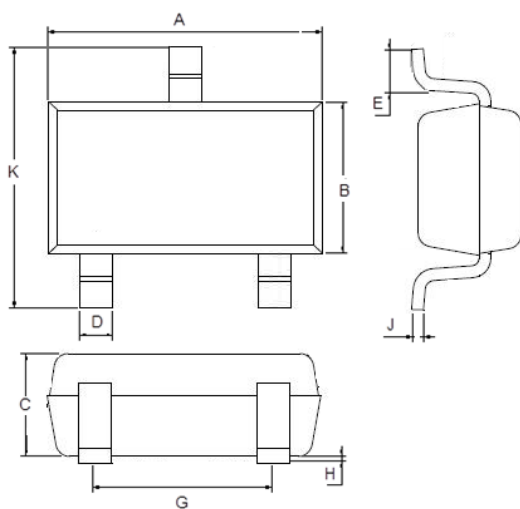
SOT-23		
Dimension	Min.	Max.
A	2.70	3.10
B	1.10	1.50
C	0.90	1.10
D	0.30	0.50
E	0.35	0.48
G	1.80	2.00
H	0.02	0.10
J	0.05	0.15
K	2.20	2.60

SOT-323



SOT-323		
Dimension	Min.	Max.
A	2.00	2.20
B	1.15	1.35
C	0.90	1.10
D	0.15	0.35
E	0.25	0.40
G	1.20	1.40
H	0.02	0.10
J	0.05	0.15
K	2.20	2.40

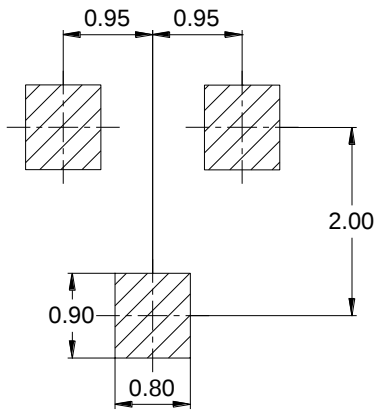
SOT-23-3L



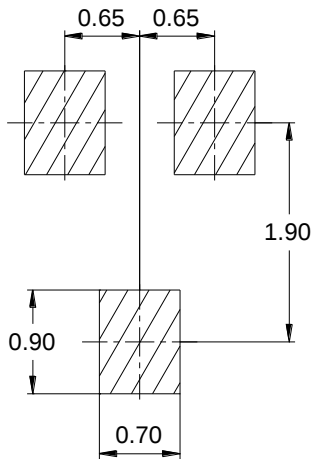
SOT-23-3L		
Dimension	Min.	Max.
A	2.80	3.00
B	1.50	1.70
C	1.00	1.20
D	0.35	0.45
E	0.35	0.55
G	1.80	2.00
H	0.02	0.10
J	0.10	0.20
K	2.60	3.00

Mounting Pad Layout (Unit: mm)

SOT-23



SOT-323



SOT-23-3L

