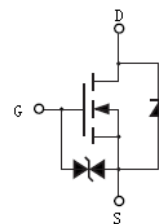


Features

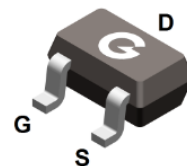
- Low on-resistance
- Low input capacitance
- Fast switching speed
- HBM: AEC-Q101-001: H2 (JESD22-A114-B: 2)
- Halogen free
- Qualified to AEC-Q101 standards for high reliability

HF



Typical Applications

- DC-DC converters
- Power management functions
- Battery operated systems and solid-state relays
- Drivers: Relays, Solenoids, Lamps, Hammers, Displays, Memories, Transistors, etc.



SOT-323

Mechanical Data

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

Ordering Information

Part Number	Package	Shipping Quantity	Marking Code
TBSS138PW	SOT-323	3000 pcs / Tape & Reel	138

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

Parameter	Symbol	Value	Unit
Drain-to-Source Voltage	V_{DS}	60	V
Gate-to-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ($T_A = 25^\circ\text{C}$) *1	I_D	360	mA
Continuous Drain Current ($T_A = 70^\circ\text{C}$) *1		290	mA
Pulsed Drain Current ($t_p = 10\mu\text{s}$, $T_A = 25^\circ\text{C}$)	I_{DM}	1500	mA
Single Pulse Avalanche Energy *4	E_{AS}	0.2	mJ
Power Dissipation ($T_A = 25^\circ\text{C}$) *1	P_D	350	mW
Power Dissipation ($T_A = 25^\circ\text{C}$) *2		260	mW
Operating Junction Temperature Range	T_J	$-55 \sim +150$	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	$-55 \sim +150$	$^\circ\text{C}$

Thermal Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal Resistance Junction-to-Case	$R_{\theta JC}$	-	-	250	$^{\circ}\text{C/W}$
Thermal Resistance Junction-to-Air ^{*1}	$R_{\theta JA}$	-	340	357	$^{\circ}\text{C/W}$
Thermal Resistance Junction-to-Air ^{*2}		-	-	480	$^{\circ}\text{C/W}$

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	60	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = 60V, V _{GS} = 0V	-	-	1	μA
I _{GSS}	Gate-Body Leakage Current	V _{GS} = ±20V, V _{DS} = 0V	-	-	±10	μA
On Characteristics						
R _{DS(ON)}	Drain-Source On-resistance *3	V _{GS} = 10V, I _D = 0.5A	-	1	1.6	Ω
		V _{GS} = 4.5V, I _D = 0.2A	-	1.2	2.5	
		V _{GS} = 2.5V, I _D = 0.1A	-	1.7	4.5	
V _{GS(TH)}	Static Drain-Source On-resistance	V _{DS} = V _{GS} , I _D = 250μA	0.8	1	1.5	V
R _G	Gate Resistance	V _{GS} = 0V, f = 1MHz	-	48	-	Ω
Dynamic Characteristics						
C _{ISS}	Input Capacitance	V _{GS} = 0V	-	32	-	pF
C _{OSS}	Output Capacitance	V _{DS} = 25V	-	6	-	
C _{RSS}	Reverse Transfer Capacitance	f = 1.0MHz	-	3	-	
Switching Characteristics						
t _{d(on)}	Turn-on Delay Time *5	V _{DD} = 25V, I _D = 0.36A V _{GS} = 10V, R _G = 6Ω	-	2.2	-	ns
t _r	Turn-on Rise Time *5		-	19.2	-	
t _{d(off)}	Turn-Off Delay Time *5		-	6.2	-	
t _f	Turn-Off Fall Time *5		-	23	-	
Q _G	Total Gate-Charge	V _{DS} = 25V	-	4	-	nC
Q _{GS}	Gate to Source Charge	V _{GS} = 10V	-	0.5	-	
Q _{GD}	Gate to Drain (Miller) Charge	I _D = 0.2A	-	0.4	-	
Source-Drain Diode Characteristics						
V _{SD}	Diode Forward Voltage *3	I _S = 0.5A, V _{GS} = 0V	-	0.89	1.4	V
t _{rr}	Reverse Recovery Time	I _F = 1A, V _{GS} = 0V	-	15	-	ns
Q _{rr}	Reverse Recovery Charge	dI _F /dt = 100A/μs	-	8	-	nC

Notes:

- The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper
- The data tested by surface mounted on a minimum recommended FR-4 board
- The data tested by pulsed, pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$
- The E_{AS} data shows Max. rating. The test condition is $V_{DD} = 30\text{V}, V_{GS} = 10\text{V}, L = 0.5\text{mH}$
- Guaranteed by design, not subject to production

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

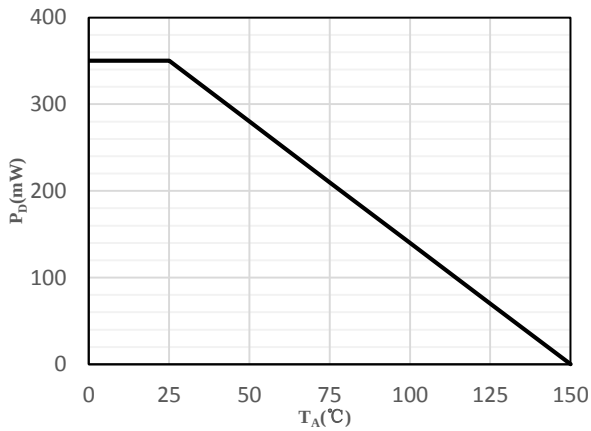


Fig 1 Power Dissipation

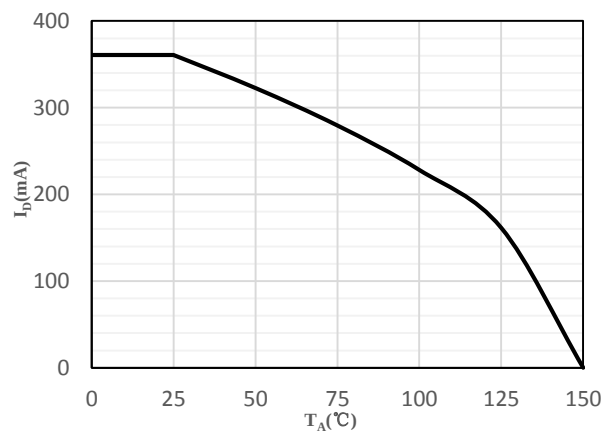


Fig 2 Drain Current

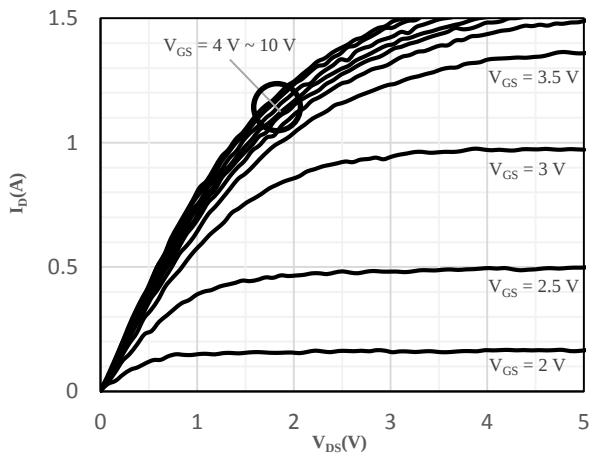


Fig 3 Typical Output Characteristics

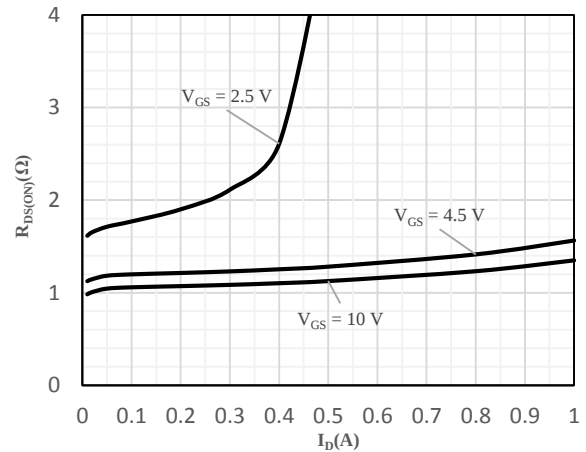


Fig 4 On-Resistance vs. Drain Current and Gate Voltage

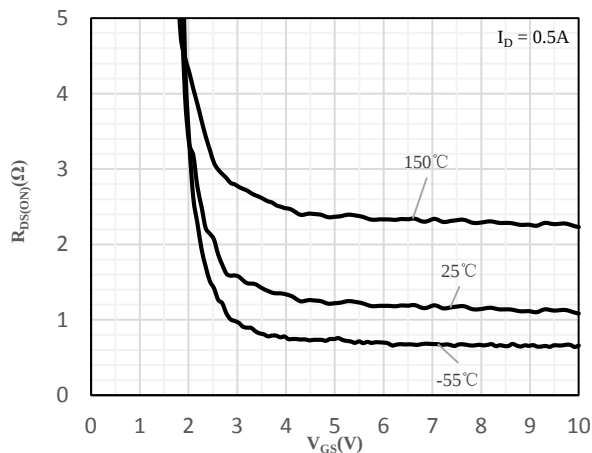


Fig 5 On-Resistance vs. Gate-Source Voltage

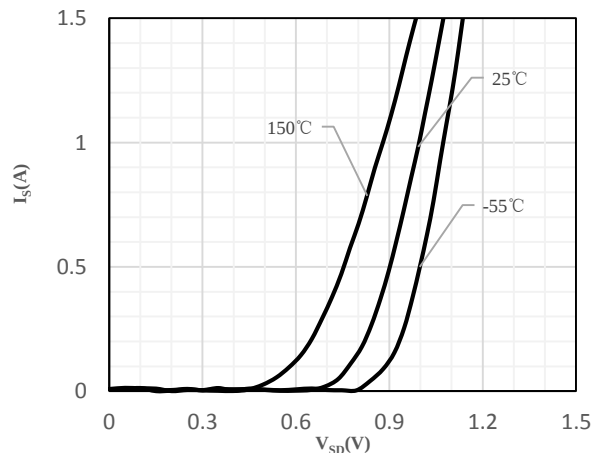


Fig 6 Body-Diode Characteristics

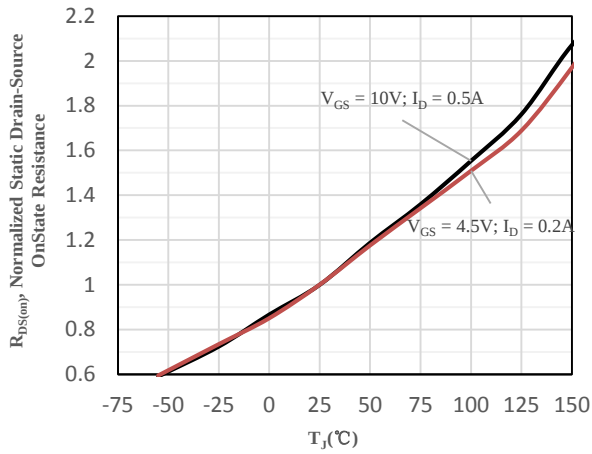


Fig 7 Normalized On-Resistance vs. Junction Temperature

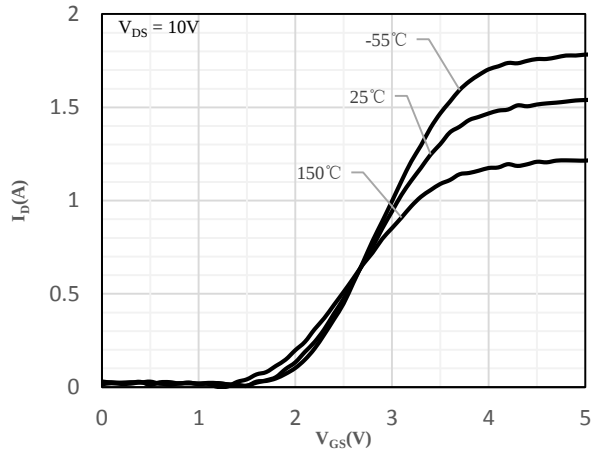


Fig 8 Transfer Characteristics

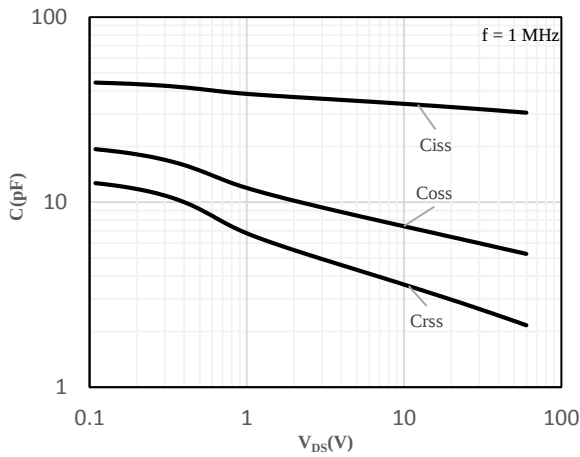


Fig 9 Capacitance Characteristics

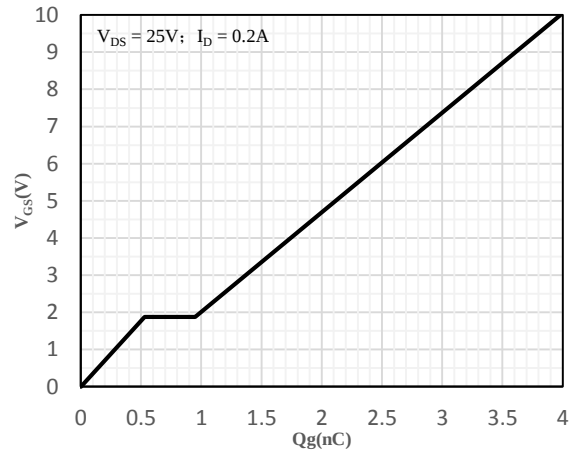


Fig 10 Gate-Charge Characteristics

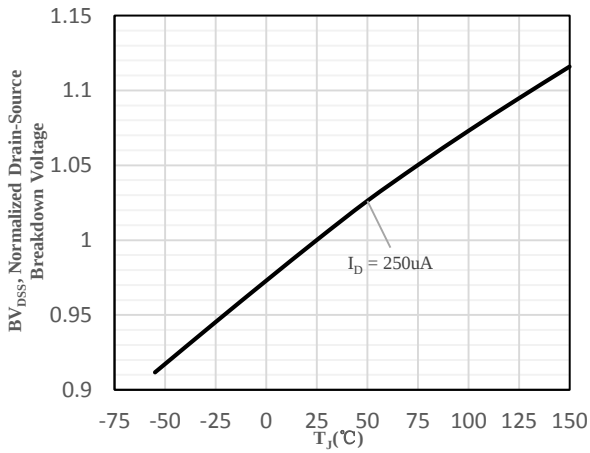


Fig 11 Normalized Breakdown Voltage vs. Junction Temperature

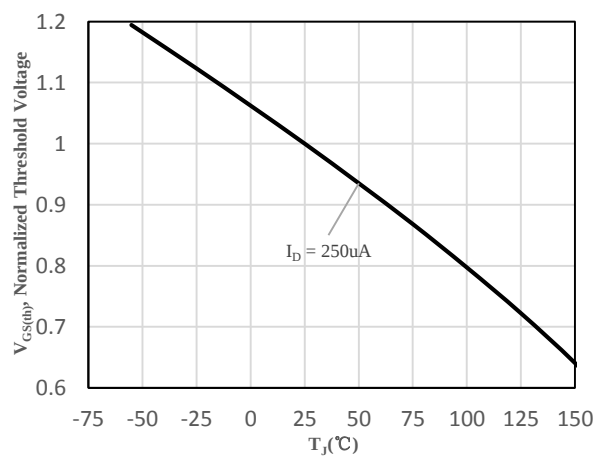


Fig 12 Normalized $V_{GS(th)}$ vs. Junction Temperature

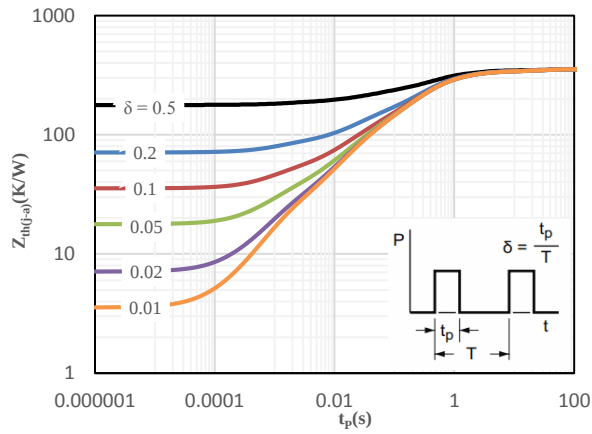


Fig 13 Safe Operation Area

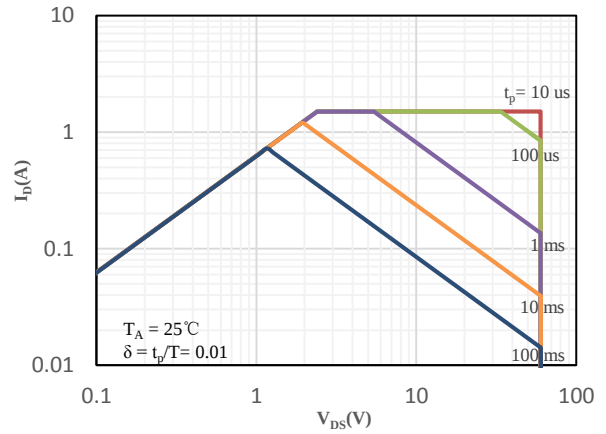
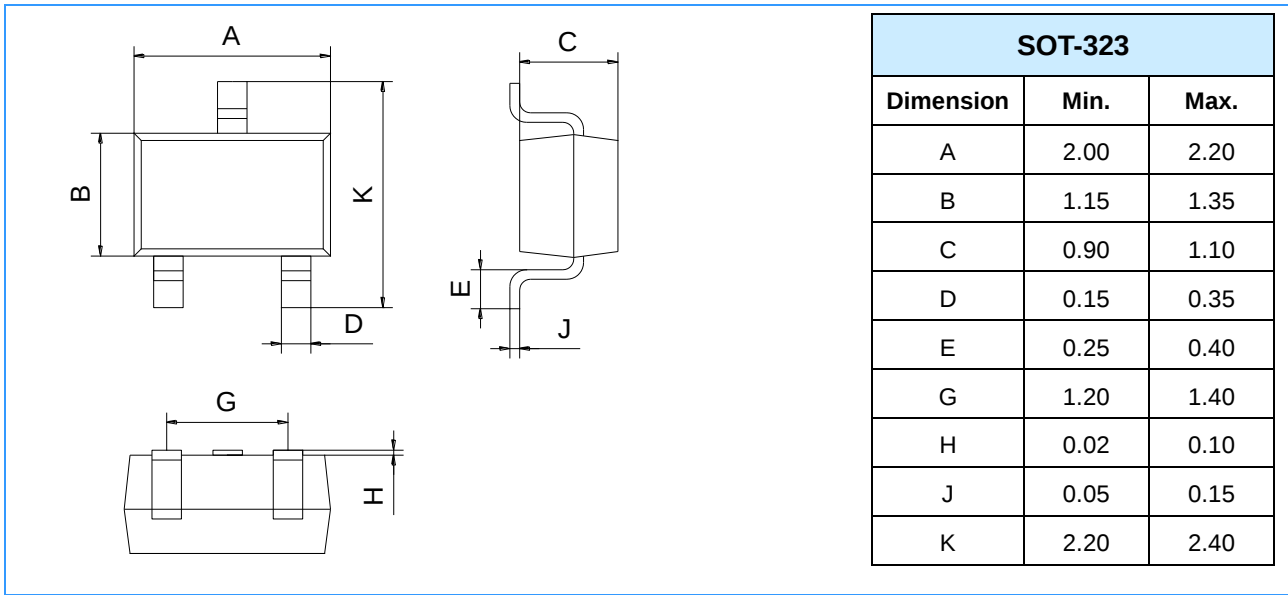
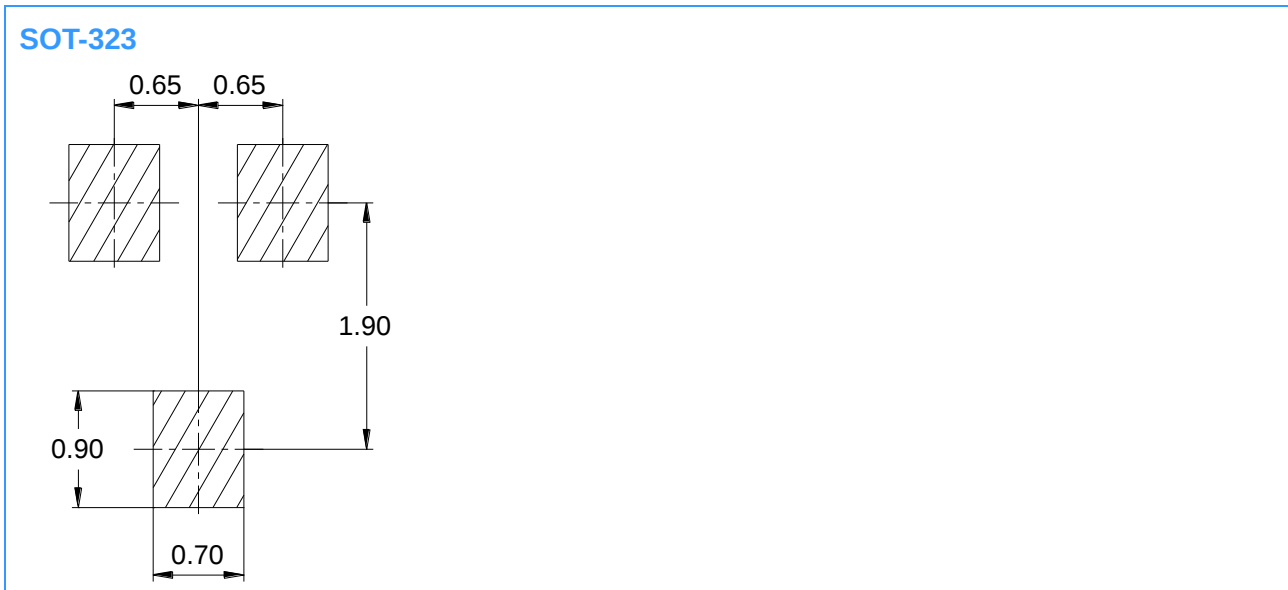


Fig 14 Maximum transient thermal impedance

Package Outline Dimensions (Unit: mm)



Mounting Pad Layout (Unit: mm)



IMPORTANT NOTICE

Changzhou Galaxy Century Microelectronics (GME) reserves the right to make changes without further notice to any product information (copyrighted) herein to make corrections, modifications, improvements, or other changes. GME does not assume any liability arising out of the application or use of any product described herein; neither does it convey any license under its patent rights, nor the rights of others.