

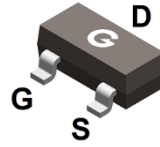
Features

- Advanced trench cell design
- Extremely low threshold voltage
- Fast switching speed with low gate charge
- HBM: AEC-Q101-001: H1A (JESD22-A114-B: 1A)
- RoHS compliant with Halogen-free
- Qualified to AEC-Q101 Standards

HF

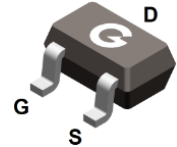
Mechanical Data

- Case: SOT-23, SOT-323, SOT-523
- Molding Compound: UL Flammability Classification Rating 94V-0
- Terminals: Matte tin-plated leads; solderability-per MIL-STD-202, Method 208



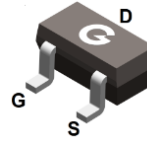
TBL1308ES

SOT-23



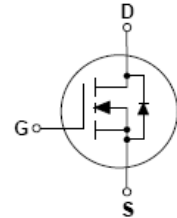
TBL1308ESW

SOT-323



TBL1308EST

SOT-523



Ordering Information

Part Number	Package	Shipping	Marking Code
TBL1308ES	SOT-23	3000 pcs / Tape & Reel	KG
TBL1308ESW	SOT-323	3000 pcs / Tape & Reel	KG
TBL1308EST	SOT-523	3000 pcs / Tape & Reel	KG

Maximum Ratings (@ T_A = 25°C unless otherwise specified)

Parameter	Symbol	Value	Units
Drain-Source Voltage	V _{DSS}	30	V
Gate -Source Voltage	V _{GSS}	±12	V
Continuous Drain Current (T _A = 25°C, SOT-23) *1	I _D	1.6	A
Continuous Drain Current (T _A = 25°C, SOT-323, SOT-523) *1		1.4	
Continuous Drain Current (T _A = 70°C, SOT-23) *1		1.3	
Continuous Drain Current (T _A = 70°C, SOT-323, SOT-523) *1		1.1	
Pulsed Drain Current (t _p = 10μs, T _A = 25°C)	I _{DM}	6	A
Single Pulse Avalanche Energy *3	E _{AS}	2	mJ
Power Dissipation *1	P _D	0.5	W
		0.3	
		0.15	
Operating Junction Temperature Range	T _J	-55 to +150	°C
Storage Temperature Range	T _{STG}	-55 to +150	°C

Thermal Characteristics

Parameter		Symbol	Limits	Unit
Thermal Resistance Junction to Ambient Air ^{*1}	SOT-23	$R_{\theta JA}$	250	°C/W
	SOT-323		417	
	SOT-523		833	
Thermal Resistance Junction to Ambient Case	SOT-23	$R_{\theta JC}$	150	°C/W
	SOT-323		200	
	SOT-523		400	

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	30	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = 30V, V _{GS} = 0V	-	-	1	μA
I _{GSS}	Gate-Body Leakage Current	V _{GS} = ±12V, V _{DS} = 0V	-	-	±15	μA
On Characteristics						
R _{DS(ON)}	Drain-Source On-resistance *2	V _{GS} = 4.5V,I _D = 0.5A	-	130	150	mΩ
		V _{GS} = 2.5V,I _D = 0.5A	-	150	180	mΩ
		V _{GS} = 1.8V,I _D = 0.5A	-	190	260	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = 250μA	0.4	0.8	1	V
R _G	Gate Resistance	V _{GS} = 0V, f = 1MHz	-	4.8	-	Ω
Dynamic Characteristics						
C _{ISS}	Input Capacitance	V _{GS} = 0V V _{DS} = 15V f = 1.0MHz	-	171	-	pF
C _{OSS}	Output Capacitance		-	15	-	
C _{RSS}	Reverse Transfer Capacitance		-	10	-	
Switching Characteristics						
t _{d(ON)}	Turn-on Delay Time *4	V _{DS} = 15V V _{GS} = 4.5V R _G = 10Ω I _D = 1A	-	7	-	ns
t _r	Turn-on Rise Time *4		-	12	-	
t _{d(OFF)}	Turn-Off Delay Time *4		-	13	-	
t _f	Turn-Off Fall Time *4		-	5	-	
Q _G	Total Gate-Charge	V _{DS} = 15V V _{GS} = 4.5V I _D = 0.5A	-	3.6	-	nC
Q _{GS}	Gate to Source Charge		-	0.6	-	
Q _{GD}	Gate to Drain (Miller) Charge		-	0.6	-	
Source-Drain Diode Characteristics						
V _{SD}	Diode Forward Voltage *2	I _{SD} = 0.5A, V _{GS} = 0V	-	0.8	1.3	V

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 $V_{DD} = 15V, V_{GS} = 6V, L = 0.1mH$
4. Guaranteed by design, not subject to production

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

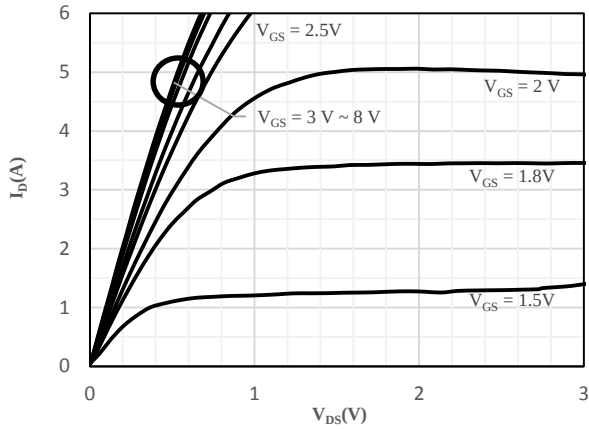


Fig 1 Output Characteristics

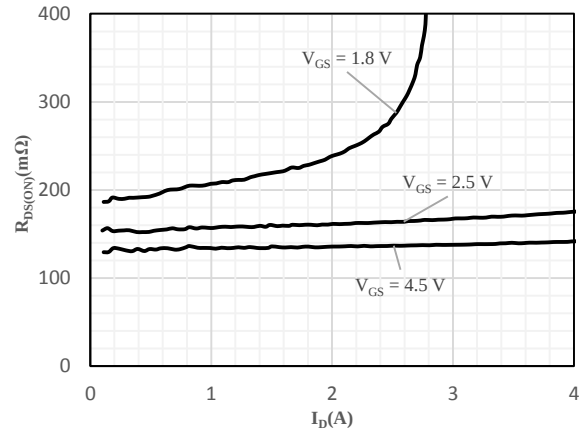


Fig 2 On-Resistance vs. Drain Current and Gate Voltage

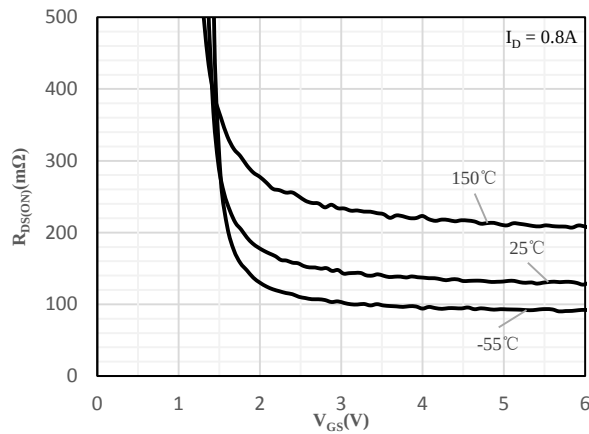


Fig 3 On-Resistance vs. Gate-Source Voltage

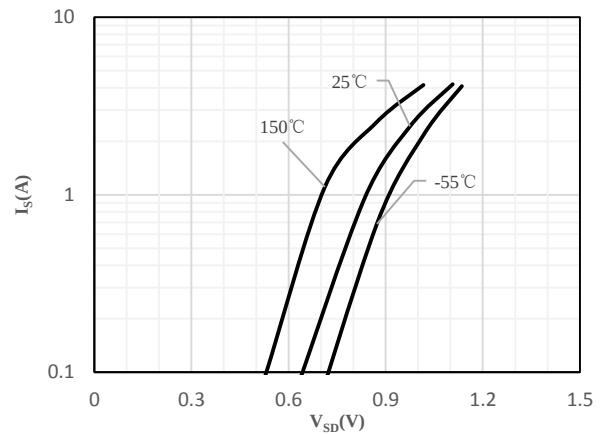


Fig 4 Body-Diode Characteristics

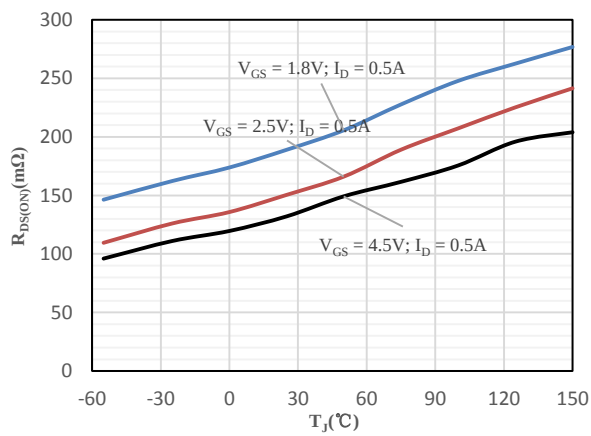


Fig 5 On-Resistance vs. Junction Temperature

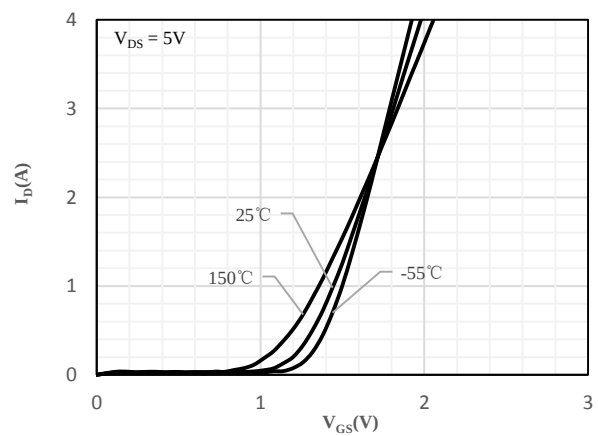


Fig 6 Transfer Characteristics

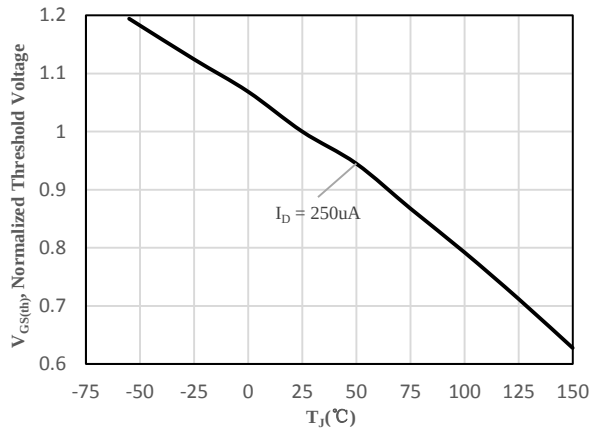


Fig 7 Normalized $V_{GS(th)}$ vs. Junction Temperature

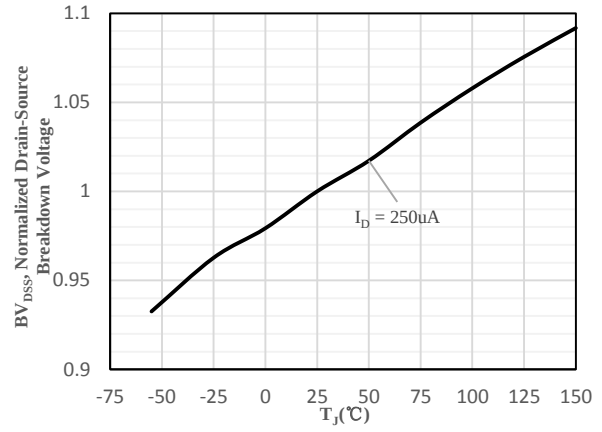


Fig 8 Normalized Breakdown Voltage vs. Junction Temperature

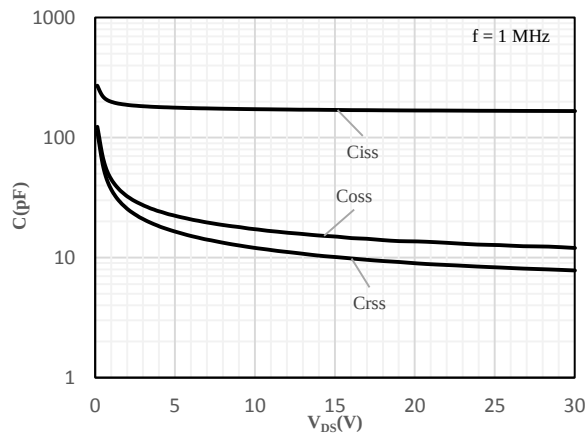


Fig 9 Capacitance Characteristics

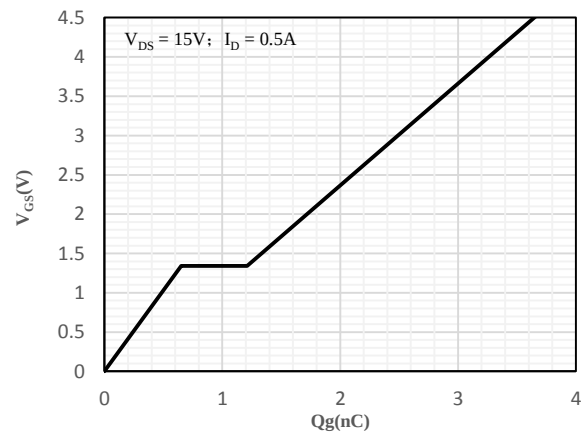
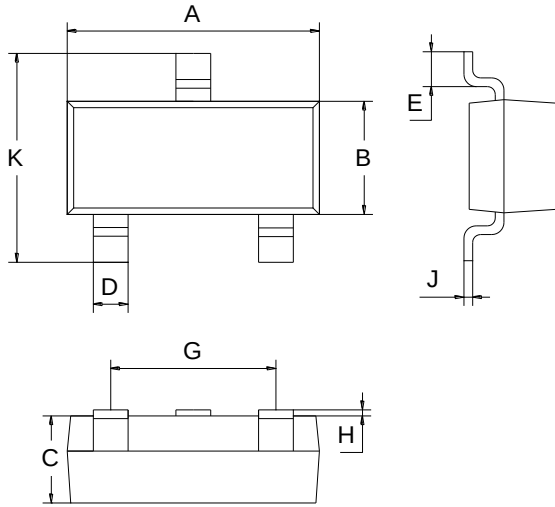
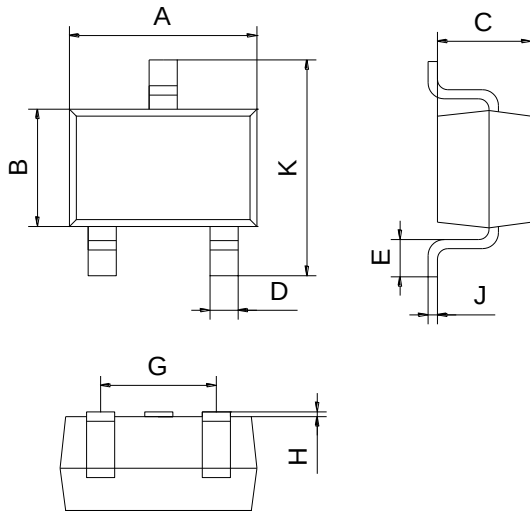


Fig 10 Gate-Charge Characteristics

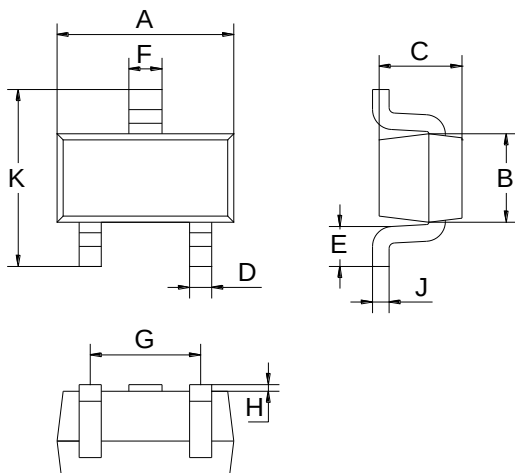
Package Outline Dimensions (Unit: mm)



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



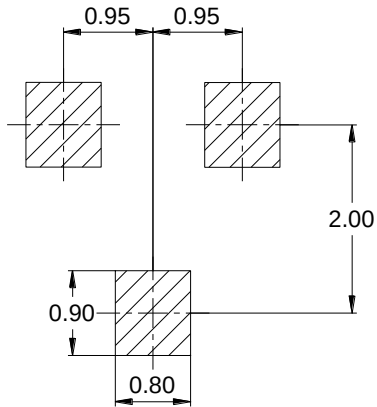
SOT-323		
Dimension	Min.	Max.
A	2.00	2.20
B	1.15	1.35
C	0.90	1.10
D	0.15	0.35
E	0.25	0.40
G	1.20	1.40
H	0.02	0.10
J	0.05	0.15
K	2.20	2.40



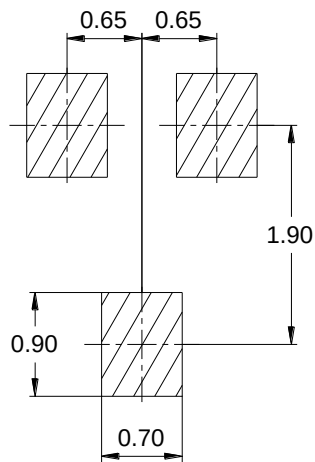
SOT-523		
Dimension	Min.	Max.
A	1.50	1.70
B	0.75	0.85
C	0.60	0.80
D	0.15	0.30
E	0.30	0.40
F	0.25	0.40
G	0.90	1.10
H	0.02	0.10
J	0.08	0.18
K	1.45	1.75

Mounting Pad Layout (Unit: mm)

SOT-23



SOT-323



SOT-523

