

Features

- Low on-resistance
- High-speed switching
- Drive circuits can be simple
- Parallel use is easy
- HBM: AEC-Q101-001: H2 (JESD22-A114-B: 2)
- Halogen free
- Qualified to AEC-Q101 standards for high reliability

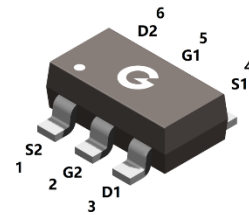
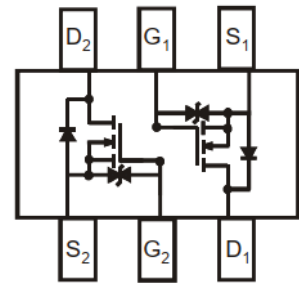
HF

Typical Applications

- N-channel enhancement mode effect transistor
- Switching application

Mechanical Data

- Case: SOT-23-6L
- Molding Compound: UL Flammability Classification Rating 94V-0
- Terminals: Matte tin-plated leads; solderability-per MIL-STD-202, Method 208



SOT-23-6L

Ordering Information

Part Number	Package	Shipping Quantity	Marking Code
TBSS5003-6L	SOT-23-6L	3000 pcs / Tape & Reel	5003

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

Parameter	Symbol	Value	Unit
Drain-to-Source Voltage	V _{DSS}	50	V
Gate-to-Source Voltage	V _{GSS}	±20	V
Continuous Drain Current *1	I _D	310	mA
Pulsed Drain Current (t _p = 10μs)	I _{DM}	2000	mA
Power Dissipation (T _A = 25°C) *1	P _D	0.4	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 Ambient Air *1	R _{θJA}	-	-	310	°C/W

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

Symbol	Parameter	Test conditions	MIN	TYP	MAX	UNIT
OFF Characteristics						
V _{DSS}	Drain-Source Breakdown Voltage	V _{GS} = 0V, I _D = 250μA	50	-	-	V
I _{DSS}	Drain to Source Leakage Current	V _{DS} = 50V, V _{GS} = 0V	-	-	1	μA
I _{GSS}	Gate-body Leakage	V _{GS} = ±20V, V _{DS} = 0V	-	-	±10	μA
ON Characteristics						
R _{DS(ON)}	Drain-Source On-resistance *2	V _{GS} = 10V, I _D = 0.5A	-	1.1	1.5	Ω
		V _{GS} = 4.5V, I _D = 0.2A	-	1.2	2.5	
		V _{GS} = 2.5V, I _D = 0.2A	-	1.6	2.9	
		V _{GS} = 1.8V, I _D = 0.05A	-	2.8	4.0	
V _{GS(TH)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = 250uA	0.5	0.8	1.0	V
R _G	Gate Resistance	V _{GS} = 0V, f = 1MHz	-	34	-	Ω
Dynamic Characteristics						
C _{ISS}	Input Capacitance	V _{GS} = 0V V _{DS} = 20V f = 1.0MHz	-	44	-	pF
C _{OSS}	Output Capacitance		-	10	-	
C _{RSS}	Reverse Transfer Capacitance		-	7	-	
Switching Characteristics						
t _{d(on)}	Turn-on Delay Time *3	V _{DD} = 30V, I _D = 0.2A V _{GS} = 10V, R _G = 25Ω R _L = 150Ω	-	6	-	nS
t _r	Turn-on Rise Time *3		-	5	-	
t _{d(off)}	Turn-Off Delay Time *3		-	25	-	
t _f	Turn-Off Fall Time *3		-	15	-	
Q _G	Total Gate-Charge	V _{DD} = 25V	-	4.3	-	nC
Q _{GS}	Gate to Source Charge	V _{GS} = 10V	-	0.7	-	
Q _{GD}	Gate to Drain (Miller) Charge	I _D = 0.2A	-	0.5	-	
Source-Drain Diode Characteristics						
V _{SD}	Diode Forward Voltage *2	I _S = 0.3A, V _{GS} = 0V	-	0.85	1.2	V

Notes:

1. The data tested by surface mounted on a FR-4 board
2. The data tested by pulsed, 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)

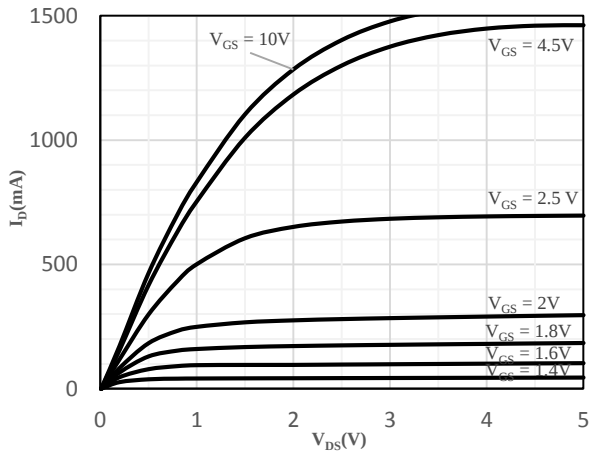


Fig 1 Typical Output Characteristics

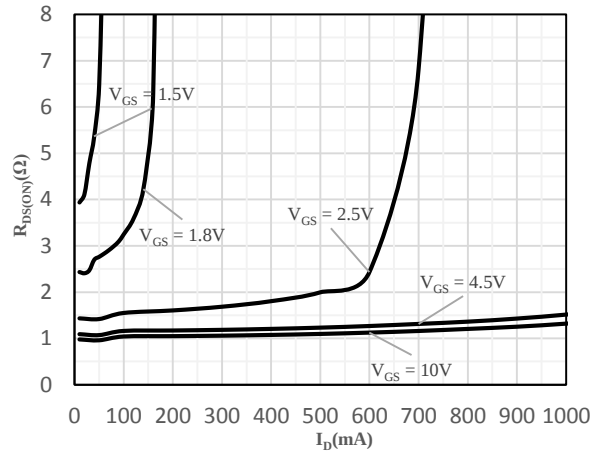


Fig 2 On-Resistance vs. Drain Current
and Gate Voltage

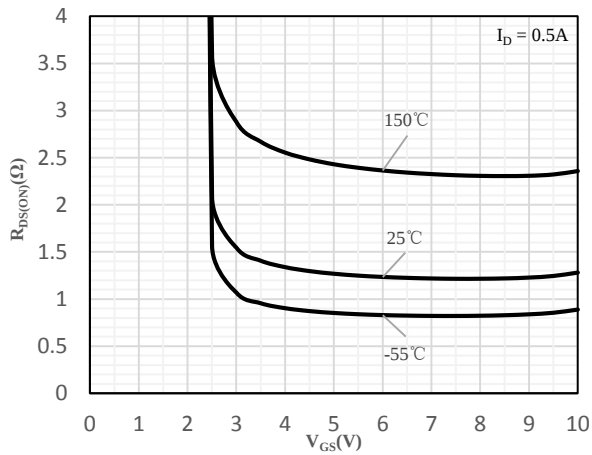


Fig 3 On-Resistance vs. Gate-Source Voltage

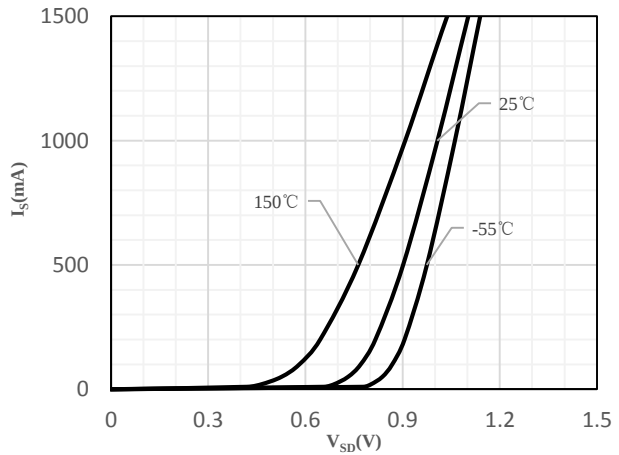


Fig 4 Body-Diode Characteristics

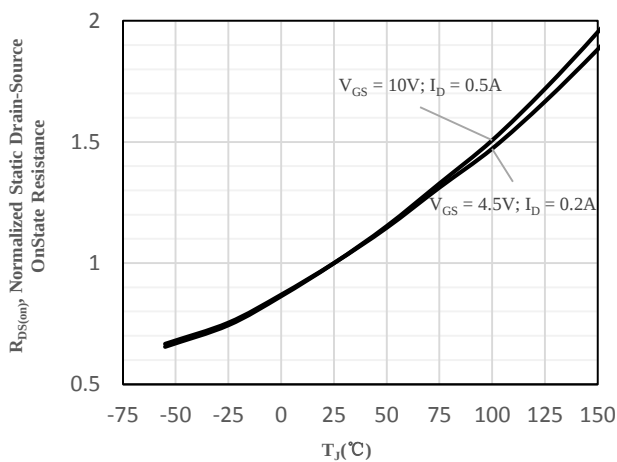


Fig 5 Normalized On-Resistance vs. Junction
Temperature

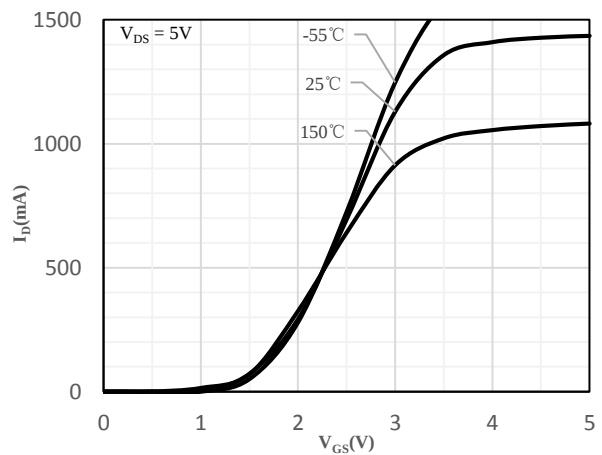


Fig 6 Transfer Characteristics

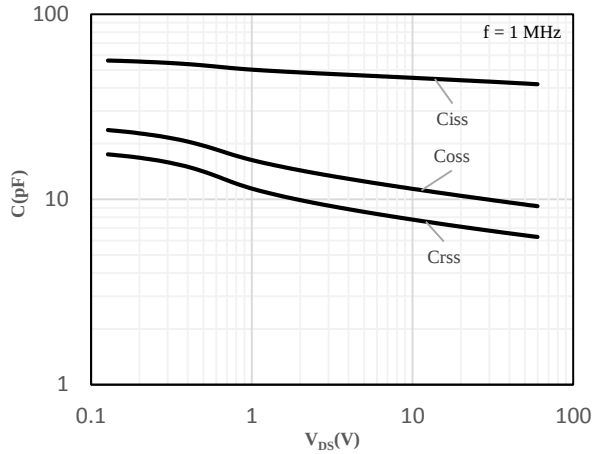


Fig 7 Capacitance Characteristics

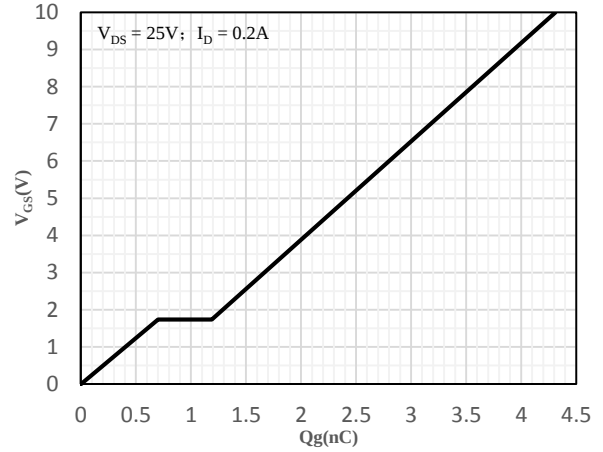


Fig 8 Gate-Charge Characteristics

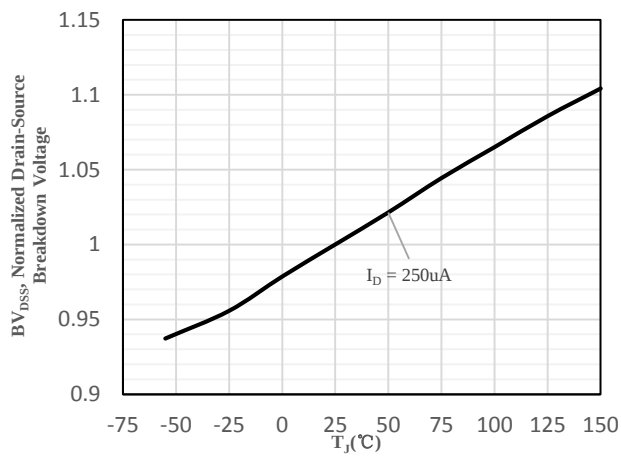


Fig 9 Normalized Breakdown Voltage
vs. Junction Temperature

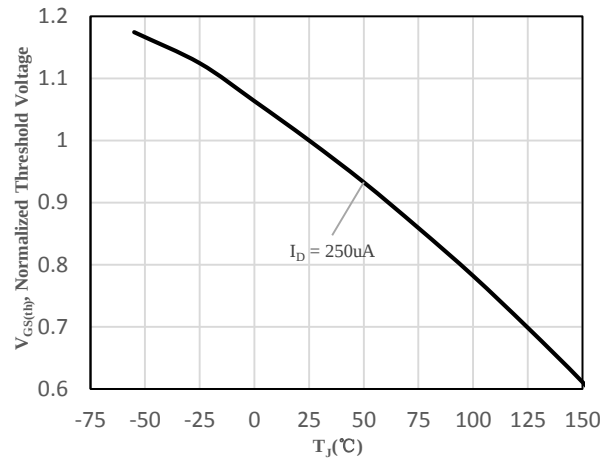


Fig 10 Normalized $V_{GS(th)}$ vs. Junction Temperature

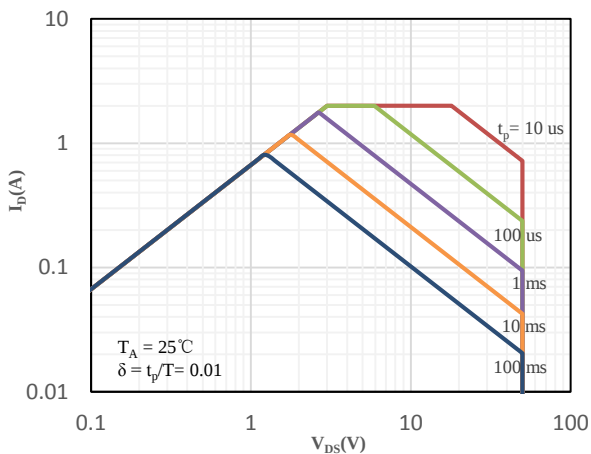


Fig 11 Safe Operation Area

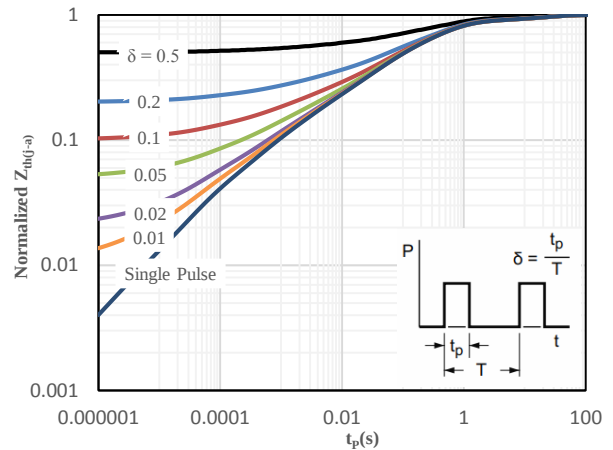
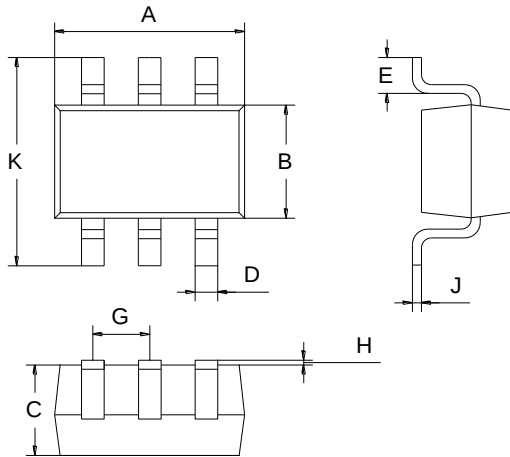


Fig 12 Normalized Maximum transient thermal
impedance

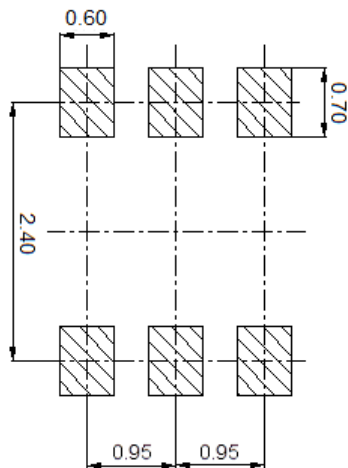
Package Outline Dimensions (Unit: mm)



SOT-23-6L		
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	0.90	1.00
H	0.02	0.10
J	0.10	0.20
K	2.60	3.00

Mounting Pad Layout (Unit: mm)

SOT-23-6L



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