

Features

- Advanced trench technology
- High-speed switching
- Drive circuits can be simple
- Parallel use is easy
- Halogen free
- Qualified to AEC-Q101 standards for high reliability

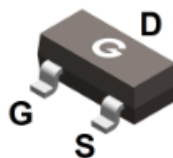
HF

Typical Applications

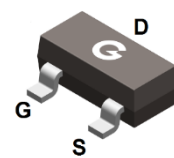
- P-channel enhancement mode effect transistor
- Switching application

Mechanical Data

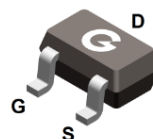
- Case: SOT-23, SOT-23-3L, SOT-323
- Molding Compound: UL Flammability Classification Rating 94V-0
- Terminals: Matte tin-plated leads; solderability-per MIL-STD-202, Method 208



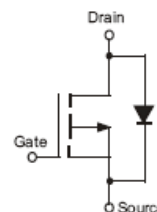
TBSS84
SOT-23



TBSS84-3L
SOT-23-3L



TBSS84W
SOT-323



Ordering Information

Part Number	Package	Shipping Quantity	Marking Code
TBSS84	SOT-23	3000 pcs / Tape & Reel	SP
TBSS84-3L	SOT-23-3L	3000 pcs / Tape & Reel	SP
TBSS84W	SOT-323	3000 pcs / Tape & Reel	K84

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}	±12	V
Continuous Drain Current (T _A = 25°C) *1	I _D	-130	mA
Pulsed Drain Current (t _p = 10μs, T _A = 25°C)	I _{DM}	-520	mA
Single Pulse Avalanche Energy *3	E _{AS}	0.4	mJ
Power Dissipation (T _A = 25°C) *1	SOT-23	0.36	W
	SOT-23-3L	0.36	
	SOT-323	0.2	
Operating Junction Temperature Range	T _J	-55 ~ +150	°C
Storage Temperature Range	T _{STG}	-55 ~ +150	°C

Thermal Characteristics

Parameter	Symbol	Value	Unit
Thermal Resistance Junction-to-Air *1	R _{θJA}	350	°C/W
		625	

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	-50	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = -50V, 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 *2	V _{GS} = -5V, I _D = -0.1A	-	2.1	10	Ω
V _{GS(TH)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = -1mA	-0.8	-1.5	-2	V
R _G	Gate Resistance	V _{GS} = 0V, f = 1MHz	-	84	-	Ω
Dynamic Characteristics						
C _{ISS}	Input Capacitance	V _{GS} = 0V	-	48	-	pF
C _{OSS}	Output Capacitance	V _{DS} = -20V	-	15	-	
C _{RSS}	Reverse Transfer Capacitance	f = 1.0MHz	-	3	-	
Switching Characteristics						
t _{d(on)}	Turn-on Delay Time *4	V _{DD} = 30V, I _D = 0.2A V _{GS} = 10V, R _G = 25Ω R _L = 150Ω	-	6	-	nS
t _r	Turn-on Rise Time *4		-	5	-	
t _{d(off)}	Turn-Off Delay Time *4		-	25	-	
t _f	Turn-Off Fall Time *4		-	15	-	
Q _G	Total Gate-Charge	V _{DD} = -30V	-	2.1	-	nC
Q _{GS}	Gate to Source Charge	V _{GS} = -4.5V	-	0.78	-	
Q _{GD}	Gate to Drain (Miller) Charge	I _D = -0.2A	-	0.4	-	
Source-Drain Diode Characteristics						
V _{SD}	Diode Forward Voltage *2	I _S = -0.26A, V _{GS} = 0 V	-	-1.15	-1.4	V

Notes:

- 1、 Surface mounted on FR4 board, and standard footprint, $t \leq 10\text{ sec}$
- 2、 The data tested by pulsed, pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$
- 3、 The E_{AS} data shows Max. rating. The test condition is $V_{DD} = -30\text{V}, V_{GS} = -10\text{V}, L = 0.1\text{mH}$
- 4、 Guaranteed by design, not subject to production

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

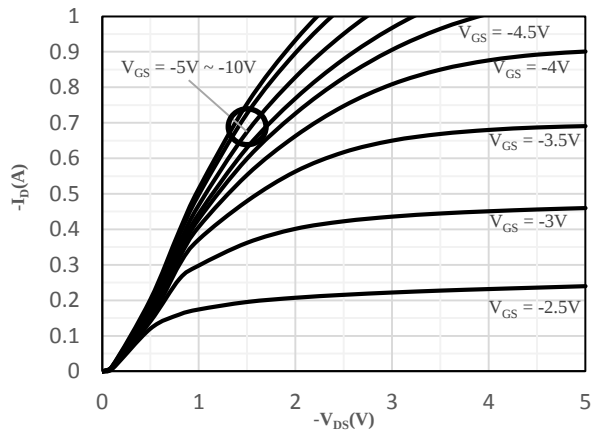


Fig 1 Typical Output Characteristics

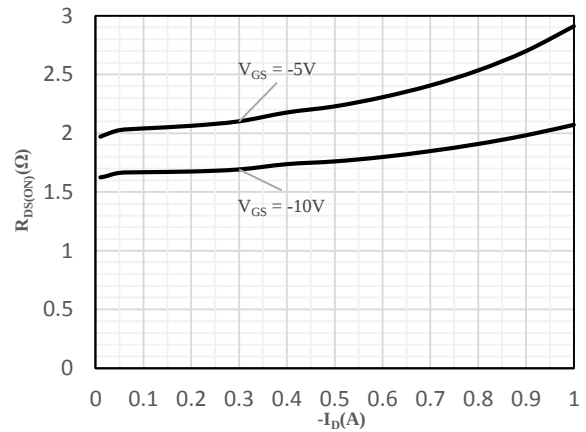


Fig 2 On-Resistance vs. Drain Current
and Gate Voltage

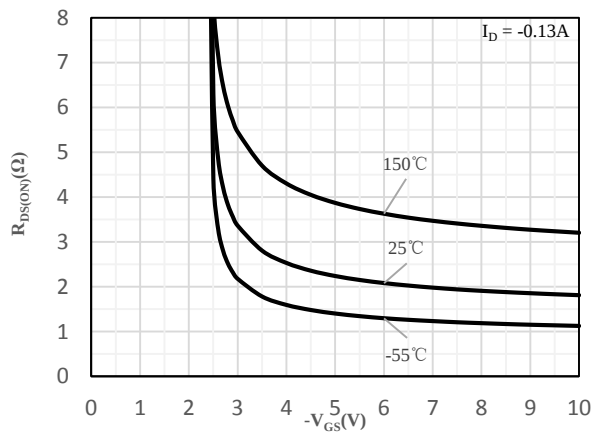


Fig 3 On-Resistance vs. Gate-Source Voltage

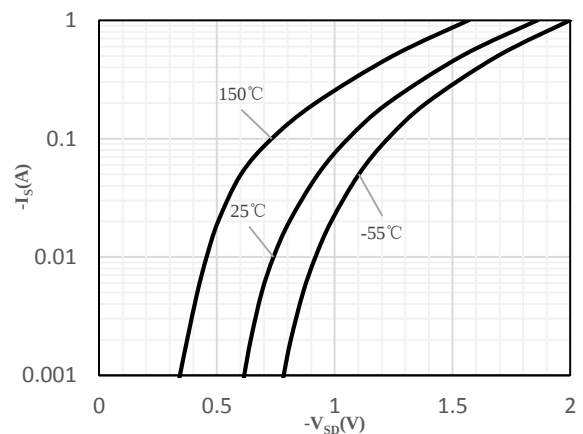


Fig 4 Body-Diode Characteristics

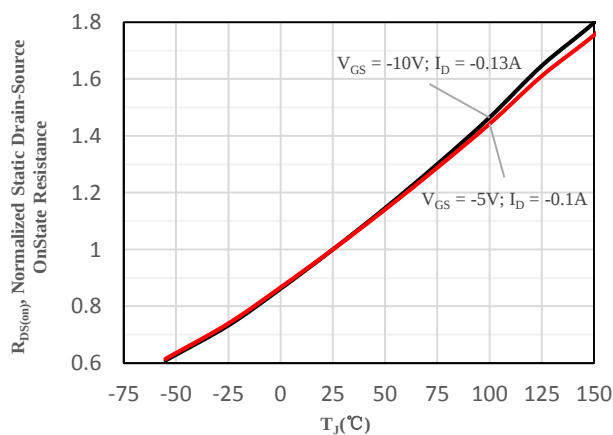


Fig 5 Normalized On-Resistance vs. Junction
Temperature

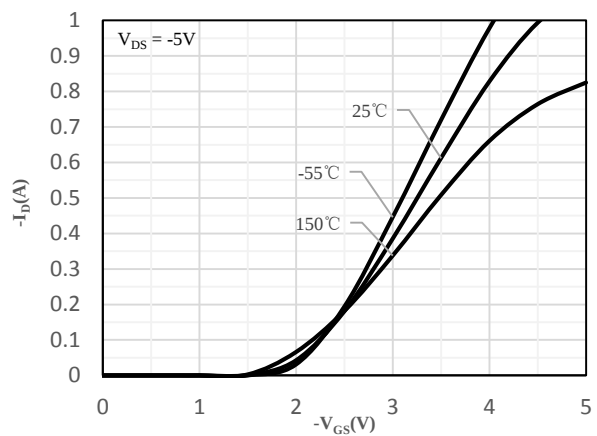


Fig 6 Transfer Characteristics

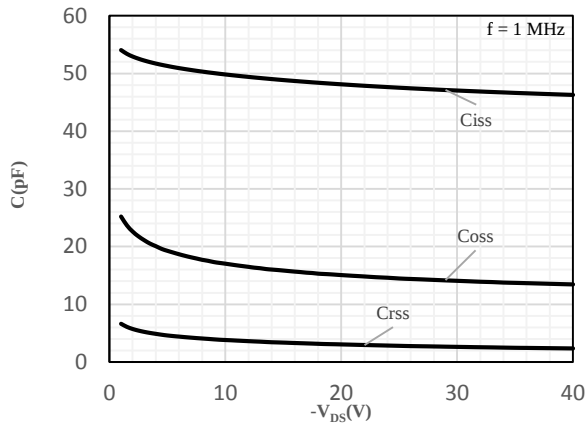


Fig 7 Capacitance Characteristics

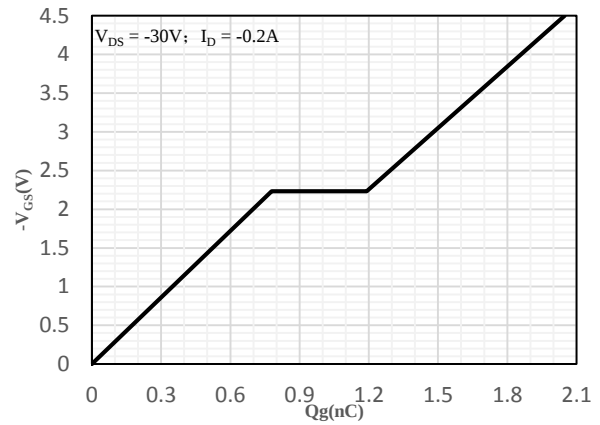


Fig 8 Gate-Charge Characteristics

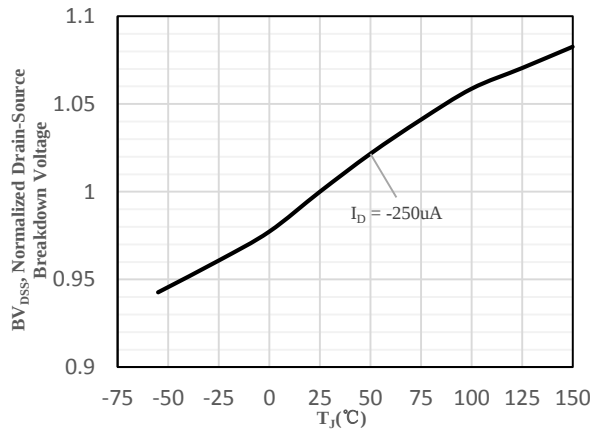


Fig 9 Normalized Breakdown Voltage
vs. Junction Temperature

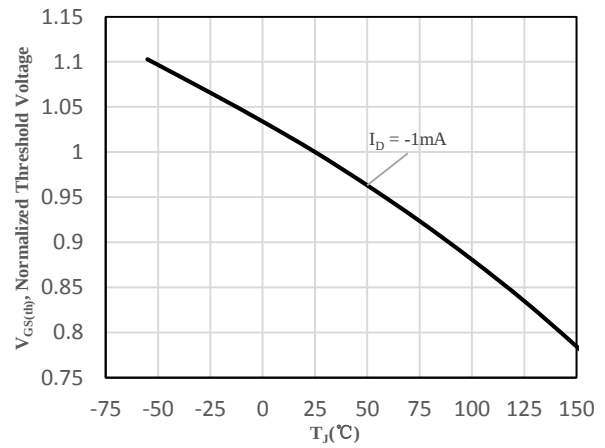
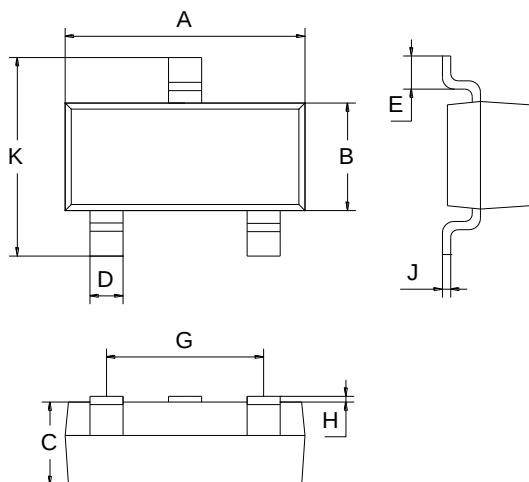


Fig 10 Normalized $V_{GS(th)}$ vs. Junction Temperature

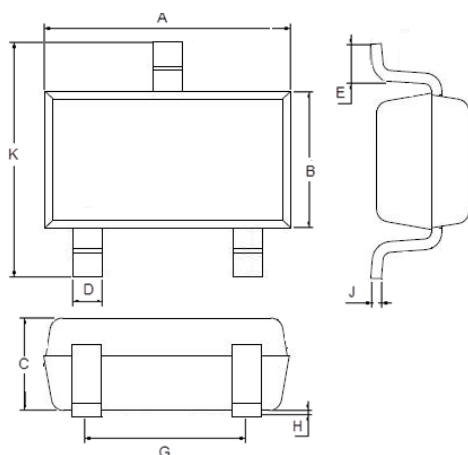
Package Outline Dimensions (Unit: mm)

SOT-23



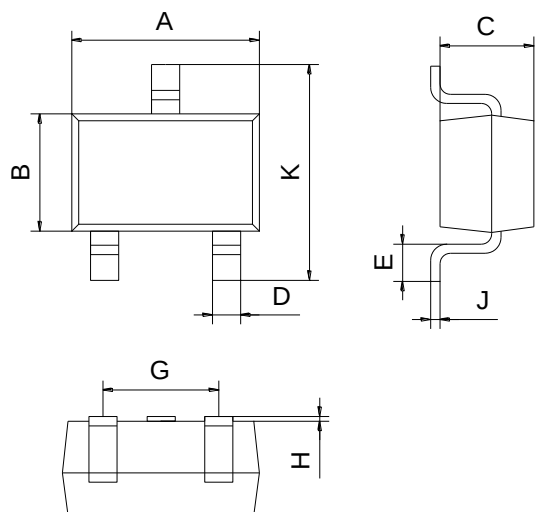
SOT-23		
Dimension	Min.	Max.
A	2.70	3.10
B	1.10	1.50
C	0.90	1.10
D	0.30	0.50
E	0.35	0.48
G	1.80	2.00
H	0.02	0.10
J	0.05	0.15
K	2.20	2.60

SOT-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

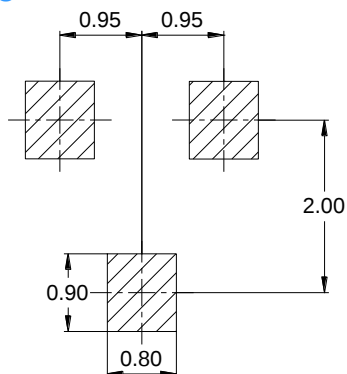
SOT-323



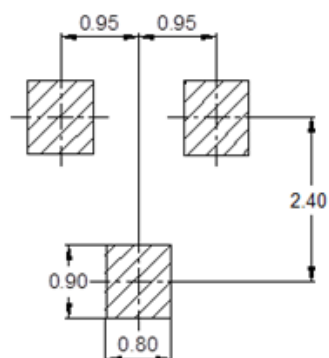
SOT-323		
Dimension	Min.	Max.
A	2.00	2.20
B	1.15	1.35
C	0.90	1.10
D	0.15	0.35
E	0.25	0.40
G	1.20	1.40
H	0.02	0.10
J	0.05	0.15
K	2.20	2.40

Mounting Pad Layout (Unit: mm)

SOT-23



SOT-23-3L



SOT-323

