

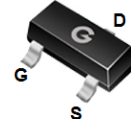
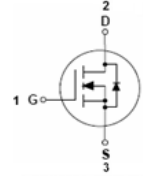
Features

- Electrostatic sensitive devices
- Halogen free
- Qualified to AEC-Q101 standards for high reliability

HF

Mechanical Data

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



SOT-23

Ordering Information

Part Number	Package	Shipping Quantity	Marking Code
TBL3402	SOT-23	3000 pcs / Tape & Reel	3402

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

Parameter	Symbol	Value	Unit
Drain-to-Source Voltage	V_{DS}	30	V
Gate-to-Source Voltage	V_{GS}	± 12	V
Continuous Drain Current ($T_A = 25^\circ\text{C}$)	I_D	4	A
Continuous Drain Current ($T_A = 70^\circ\text{C}$)		3.4	A
Pulsed Drain Current	I_{DM}	15	A

Thermal Characteristics

Parameter	Symbol	Value	Unit
Power Dissipation	P_D	1.4	W
Thermal Resistance Junction-to-Air	$R_{\theta JA}$	70	$^\circ\text{C/W}$
Operating Junction Temperature Range	T_J	$-55 \sim +150$	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	$-55 \sim +150$	$^\circ\text{C}$

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} = 24V, V _{GS} = 0V	-	-	1	μA
I _{GSS}	Gate-Body Leakage Current	V _{GS} = ±12V, V _{DS} = 0V	-	-	±100	nA
On Characteristics						
R _{DS(ON)}	Static Drain-Source On-resistance	V _{GS} = 10V, I _D = 4A	-	31	55	mΩ
		V _{GS} = 4.5V, I _D = 3A	-	33	70	
		V _{GS} = 2.5V, I _D = 2A	-	42	110	
V _{GS(TH)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = 250μA	0.6	0.83	1.4	V
g _{FS}	Forward Transconductance	V _{DS} = 5V, I _D = 4A	-	8	-	S
Dynamic Characteristics						
C _{ISS}	Input Capacitance	V _{GS} = 0V V _{DS} = 15V f = 1.0MHz	-	850	-	pF
C _{OSS}	Output Capacitance		-	80	-	
C _{RSS}	Reverse Transfer Capacitance		-	71	-	
R _G	Gate Resistance	V _{DS} = 0V, V _{GS} = 0V f = 1.0MHz	-	2.4	-	Ω
Switching Characteristics						
Q _G	Total Gate-Charge	V _{GS} = 10V V _{DS} = 15V I _D = 4A	-	24	-	nC
Q _{GS}	Gate to Source Charge		-	1.8	-	
Q _{GD}	Gate to Drain (Miller) Charge		-	3.7	-	
t _{d(ON)}	Turn-on Delay Time	V _{GS} = 10V V _{DD} = 15V R _L = 3.75Ω R _G = 6Ω	-	3.3	-	ns
t _r	Turn-on Rise Time		-	1	-	
t _{d(OFF)}	Turn-Off Delay Time		-	21.7	-	
t _f	Turn-Off Fall Time		-	2.1	-	
Source-Drain Diode Characteristics						
V _{SD}	Diode Forward Voltage	I _S = 2A, V _{GS} = 0 V	-	0.68	1.0	V
t _{rr}	Body Diode Reverse Recovery Time	I _F = 4A, dI/dt = 100A/μs	-	90	-	nS
Q _{rr}	Body Diode Reverse Recovery Charge		-	56	-	nC

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

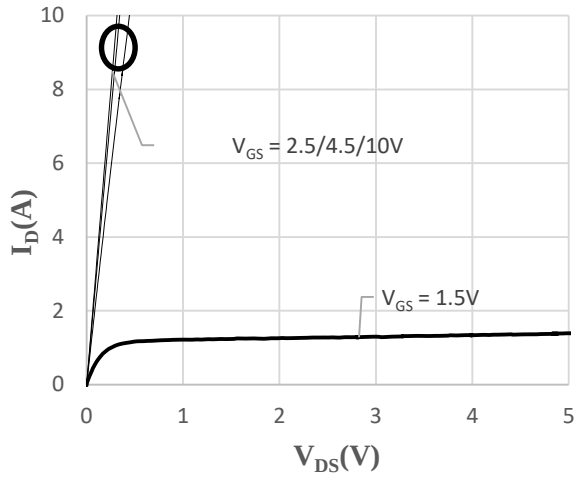


Fig 1 Output Characteristics

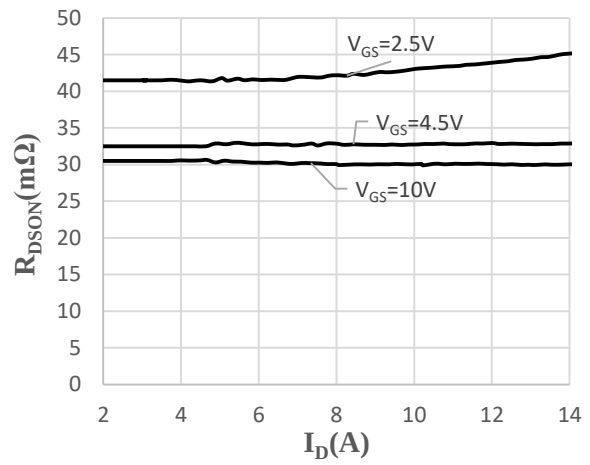


Fig 2 On-Resistance vs. Drain Current and Gate Voltage

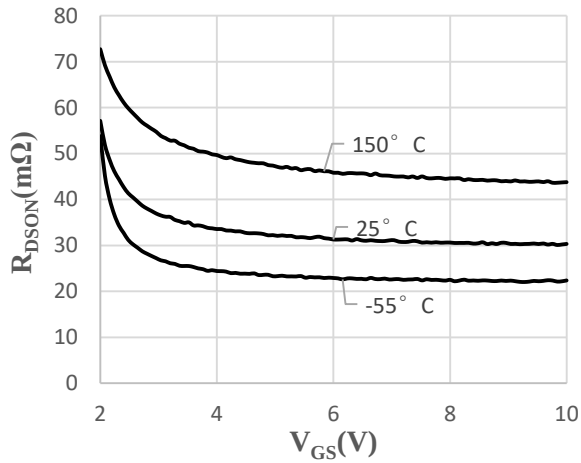


Fig 3 On-Resistance vs. Gate-Source Voltage

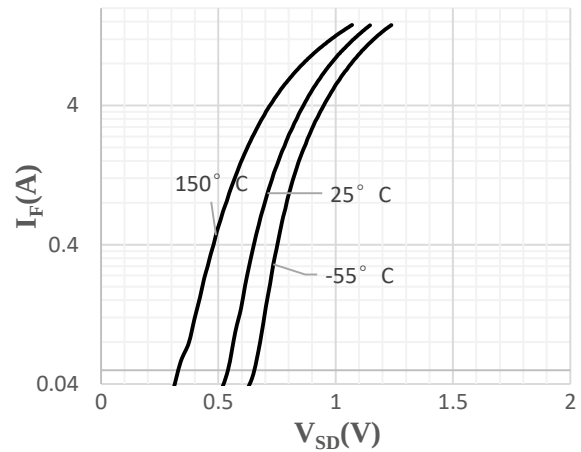


Fig 4 Body-Diode Characteristics

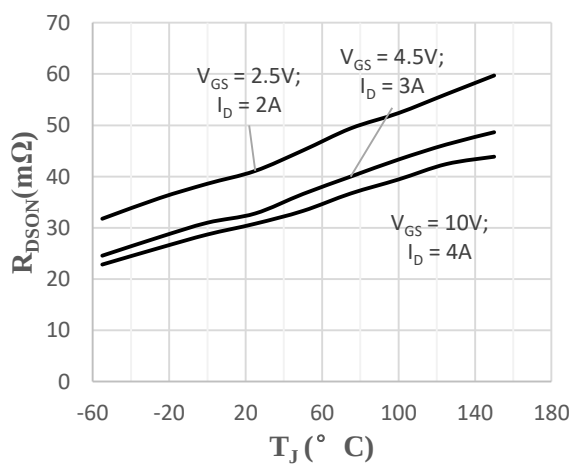


Fig 5 On-Resistance vs. Junction Temperature

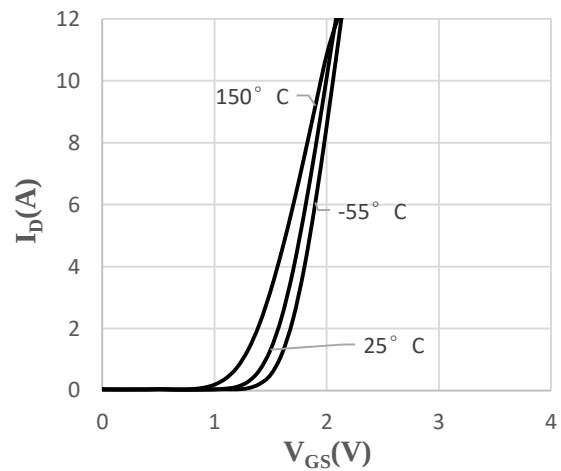


Fig 6 Transfer Characteristics

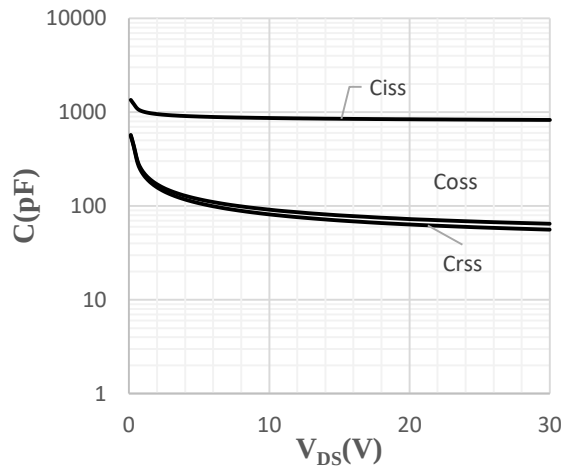


Fig 7 Capacitance Characteristics

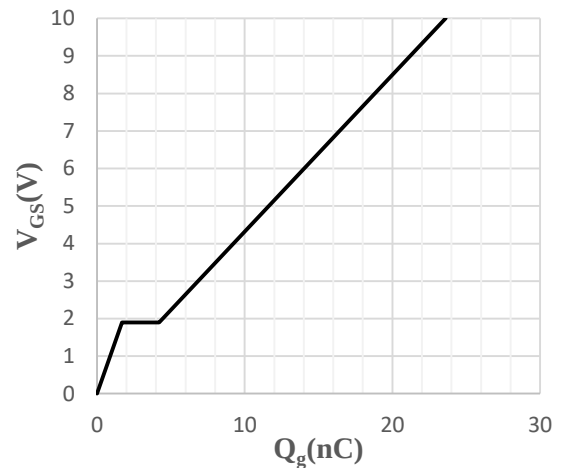


Fig 8 Gate Voltage vs. Junction Temperature

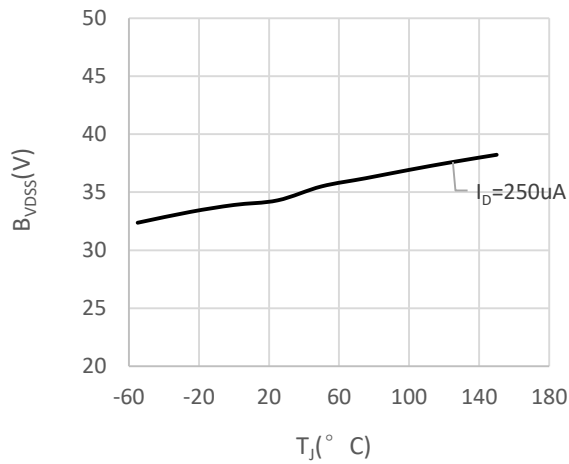


Fig 9 Drain-Source vs. Junction Temperature

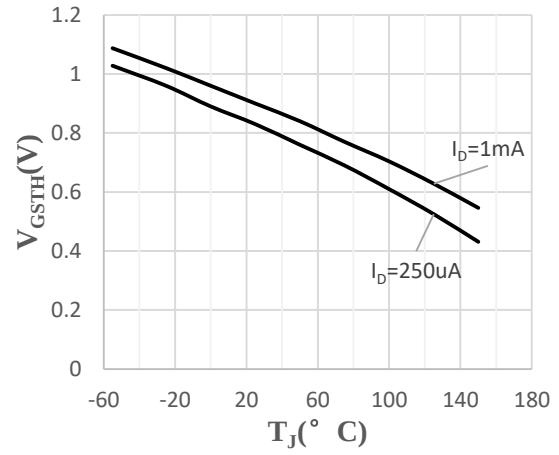
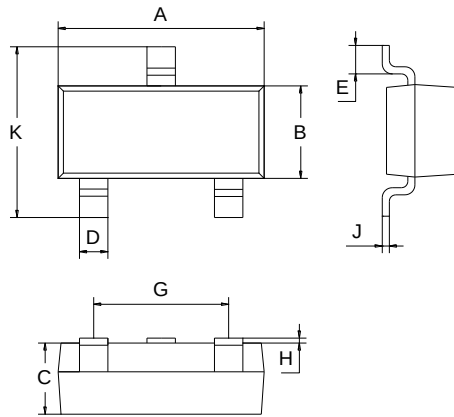


Fig 10 Gate Threshold Voltage vs.
Junction Temperature

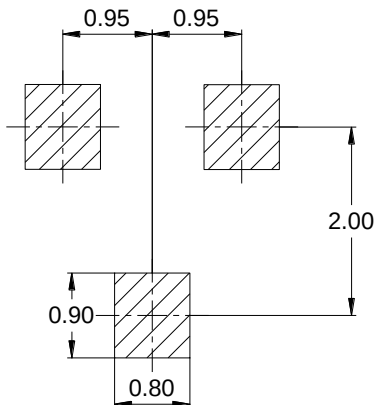
Package Outline Dimensions (Unit: mm)



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

Package Outline Dimensions (Unit: mm)

SOT-23



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