N-Channel Enhancement Mode MOSFET

TBL3428

Features

HF

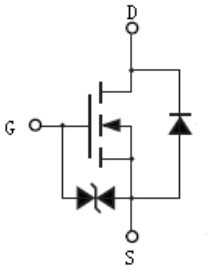
- Advanced trench cell design
- HBM: AEC-Q101-001: H1C (JESD22-A114-B: 1C)
- RoHS compliant with Halogen-free
- Qualified to AEC-Q101 Standards

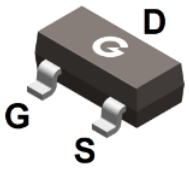
APPLICATIONS

- Load switch appliances

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
TBL3428	SOT-23	3000 pcs / Tape & Reel	3428

Maximum Ratings (@ T_A = 25℃ unless otherwise specified)

Parameter	Symbol	Value	Unit
Drain-to-Source Voltage	V_{DSS}	30	V
Gate-to-Source Voltage	V_{GSS}	±10	V
Continuous Drain Current *1	I_D	0.4	A
Continuous Drain Current (T_A = 70°C) *1		0.32	A
Pulsed Drain Current (t_p = 10μs)	I_{DM}	1.6	A
Power Dissipation*1	P_D	0.42	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-Air *1	$R_{\theta JA}$	-	-	300	°C/W

Electrical Characteristics (@ T_A = 25℃ 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} = ±8V, V_{DS} = 0V	-	-	±10	μA
On Characteristics						
$R_{DS(ON)}$	Drain-Source On-resistance *2	V_{GS} = 4.5V,I_D = 0.3A	-	-	1.2	Ω
		V_{GS} = 2.5V,I_D = 0.2A	-	-	1.6	Ω
		V_{GS} = 1.8V,I_D = 0.1A	-	-	2	Ω
		V_{GS} = 1.5V,I_D = 0.05A	-	-	3	Ω
		V_{GS} = 1.2V,I_D = 0.02A	-	-	4	Ω
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS} = V_{GS}, I_D = 250μA	0.4	-	1.0	V
Dynamic Characteristics						
C_{ISS}	Input Capacitance	V_{GS} = 0V V_{DS} = 10V f = 1.0MHz	-	45	-	pF
C_{OSS}	Output Capacitance		-	14	-	
C_{RSS}	Reverse Transfer Capacitance		-	0.8	-	
Switching Characteristics						
$t_{d(ON)}$	Turn-on Delay Time *3	V_{DD} = 10V V_{GS} = 4V R_G = 10Ω I_D =0.3A	-	8.3	-	ns
t_r	Turn-on Rise Time *3		-	5.7	-	
$t_{d(OFF)}$	Turn-Off Delay Time *3		-	35	-	
t_f	Turn-Off Fall Time *3		-	12	-	
Q_G	Total Gate-Charge	V_{DD} = 10V V_{GS} = 4.5V I_D = 0.3A	-	0.9	-	nC
Q_{GS}	Gate to Source Charge		-	0.3	-	
Q_{GD}	Gate to Drain (Miller) Charge		-	0.2	-	
Source-Drain Diode Characteristics						
V_{SD}	Diode Forward Voltage *2	I_{SD} = 0.3A, V_{GS} = 0V	-	-	1.3	V

Notes:

1. The data tested by surface mounted on a 1 inch^2 FR-4 board with 2OZ copper
2. The data tested by pulsed, pulse width ≤ 300μs, duty cycle ≤ 2%
3. Guaranteed by design, not subject to production

Ratings and Characteristics Curves (@ T_A = 25°C unless otherwise specified)

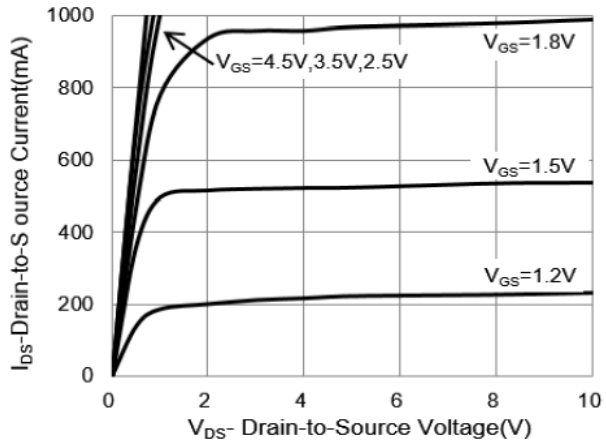


Fig 1 On-Region Characteristics

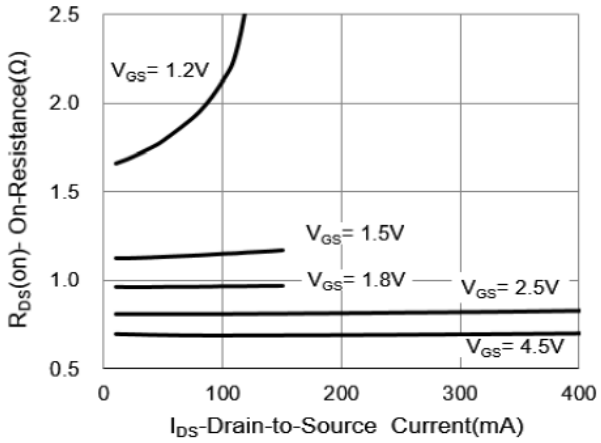


Fig 2 On-Resistance vs. Drain Current and Gate Voltage

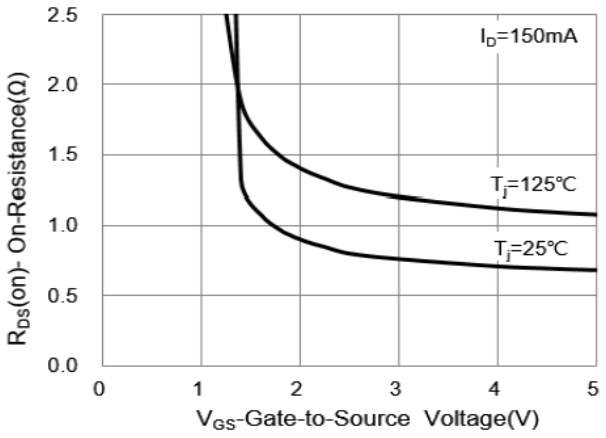


Fig 3 On-Resistance vs. Gate-Source Voltage

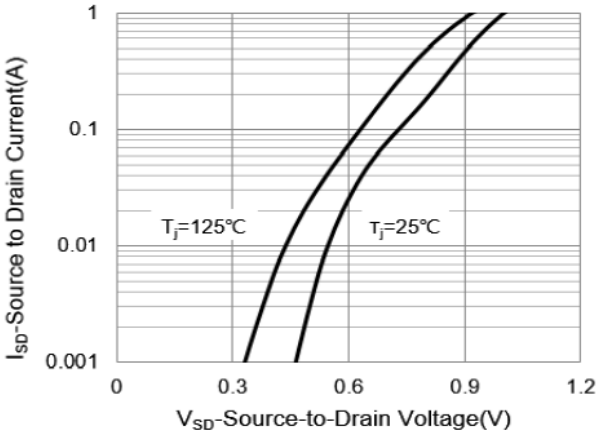


Fig 4 Body-Diode Characteristics

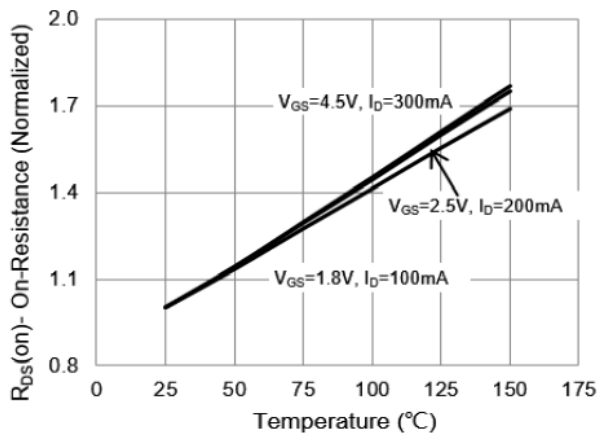


Fig 5 On-Resistance vs. Junction Temperature

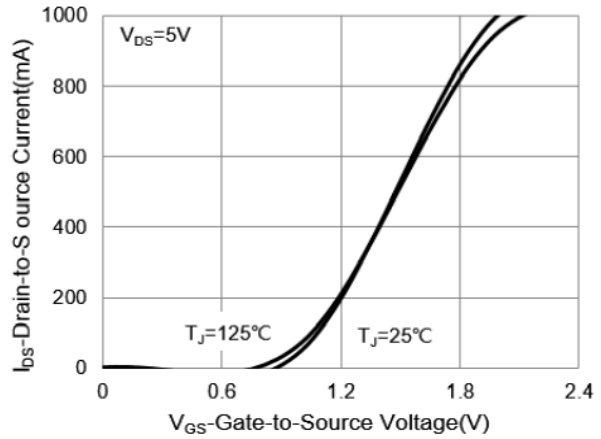


Fig 6 Transfer Characteristics

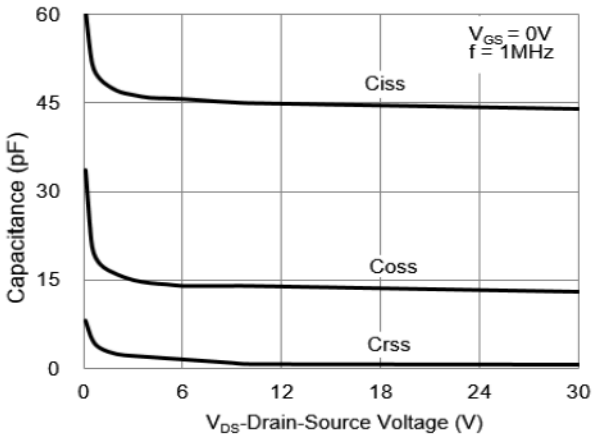


Fig 7 Capacitance Characteristics

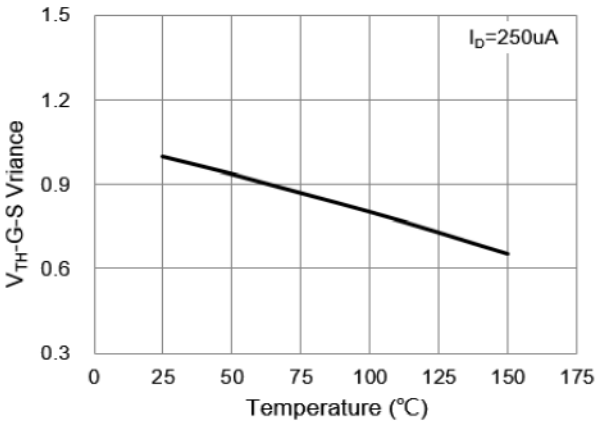
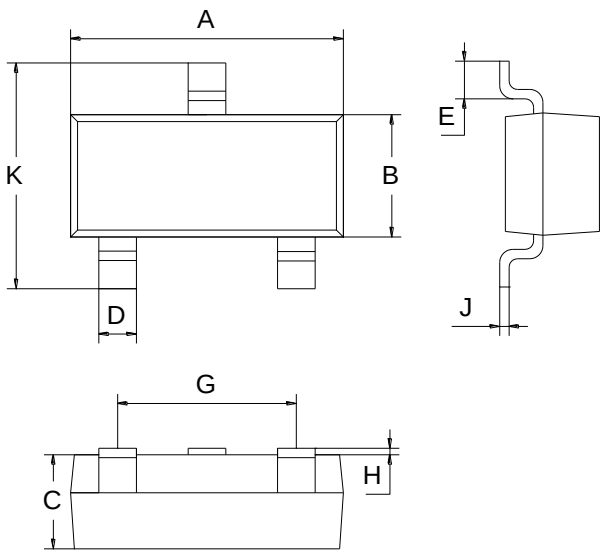


Fig 8 Gate Voltage vs. Junction Temperature

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

Mounting Pad Layout (Unit: mm)

SOT-23