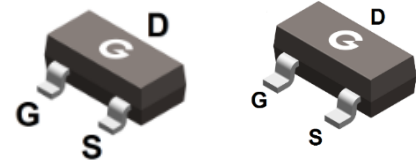


Features

- High-speed switching
- Drive circuits can be simple
- Parallel use is easy
- HBM: AEC-Q101-001: H1A (JESD22-A114-B: 1A)
- RoHS compliant with Halogen-free
- Qualified to AEC-Q101 Standards

HF



TBL3415
SOT-23

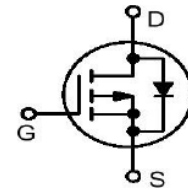
TBL3415-3L
SOT-23-3L

Typical Applications

- Power management in note book
- Switching application
- Battery powered system
- Load switch

Mechanical Data

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



Ordering Information

Part Number	Package	Shipping Quantity	Marking Code
TBL3415	SOT-23	3000 pcs / Tape & Reel	3415
TBL3415-3L	SOT-23-3L	3000 pcs / Tape & Reel	3415

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

Parameter	Symbol	Value	Unit
Drain-to-Source Voltage	V _{DSS}	-20	V
Gate-to-Source Voltage	V _{GSS}	±12	V
Continuous Drain Current (T _A = 25°C) ^{*1}	I _D	-4	A
Continuous Drain Current (T _A = 70°C) ^{*1}		-3.5	
Pulsed Drain Current (t _p = 10μs, T _A = 25°C)	I _{DM}	-30	A
Single Pulse Avalanche Energy ^{*3}	E _{AS}	5.5	mJ
Power Dissipation (T _C = 25°C)	P _D	2.5	W
Power Dissipation (T _A = 25°C) ^{*1}		1.25	
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-Case	$R_{\theta JC}$	-	35	50	$^{\circ}\text{C/W}$
Thermal Resistance Junction-to-Air ^{*1}	$R_{\theta JA}$	-	90	100	$^{\circ}\text{C/W}$

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	-20	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = -20V, V _{GS} = 0V	-	-	-1	μA
I _{GSS}	Gate-Body Leakage Current	V _{GS} = ±12V, V _{DS} = 0V	-	-	±100	nA
On Characteristics						
R _{DS(ON)}	Drain-Source On-resistance *2	V _{GS} = -4.5V, I _D = -4A	-	32	50	mΩ
		V _{GS} = -2.5V, I _D = -4A	-	43	70	
		V _{GS} = -1.8V, I _D = -1A	-	78	100	mΩ
V _{GS(TH)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = -250uA	-0.3	-0.75	-1.0	V
R _G	Gate Resistance	V _{GS} = 0V, f = 1MHz	-	29	-	Ω
Dynamic Characteristics						
C _{ISS}	Input Capacitance	V _{GS} = 0V V _{DS} = -10V f = 1.0MHz	-	977	-	pF
C _{OSS}	Output Capacitance		-	109	-	
C _{RSS}	Reverse Transfer Capacitance		-	92	-	
Switching Characteristics						
t _{d(ON)}	Turn-on Delay Time *4	V _{DD} = -10V V _{GS} = -4.5V R _G = 3Ω R _L = 2.5Ω	-	9.5	-	ns
t _r	Turn-on Rise Time *4		-	17	-	
t _{d(OFF)}	Turn-Off Delay Time *4		-	94	-	
t _f	Turn-Off Fall Time *4		-	35	-	
Q _G	Total Gate-Charge	V _{DD} = -10V	-	10	-	nC
Q _{GS}	Gate to Source Charge	V _{GS} = -4.5V	-	2.3	-	
Q _{GD}	Gate to Drain (Miller) Charge	I _D = -4A	-	2	-	
Source-Drain Diode Characteristics						
V _{SD}	Diode Forward Voltage *2	I _{SD} = -1A, V _{GS} = 0V	-	-0.7	-1	V

Notes:

1. The data tested by surface mounted on a 1 inch² FR-4 board with 20Z copper
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 $V_{DD} = -10\text{V}$, $V_{GS} = -6\text{V}$, $L = 0.1\text{mH}$
4. Guaranteed by design, not subject to production

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

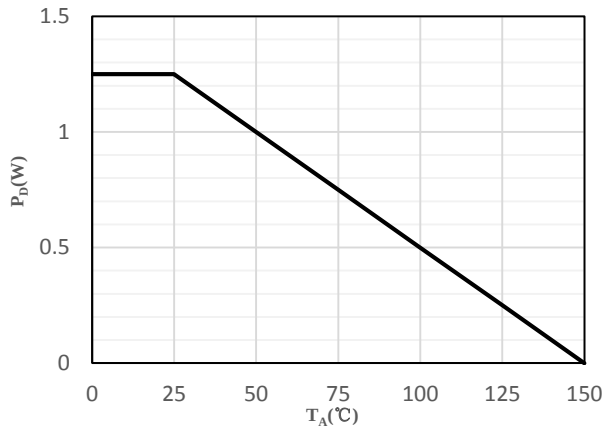


Fig 1 Power Dissipation

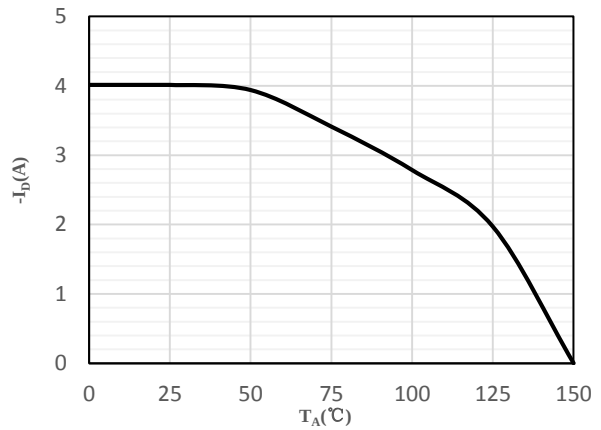


Fig 2 Drain Current

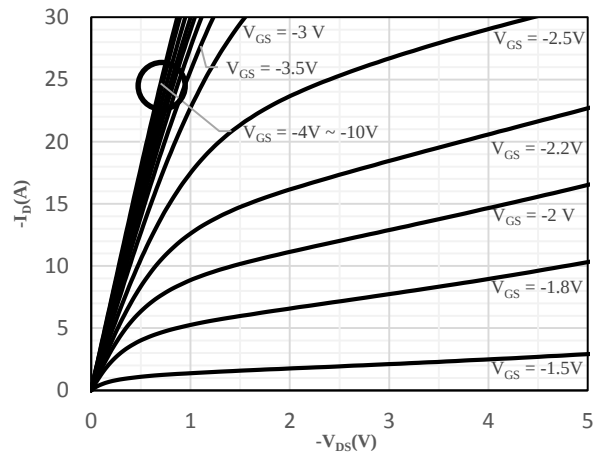


Fig 3 Typical Output Characteristics

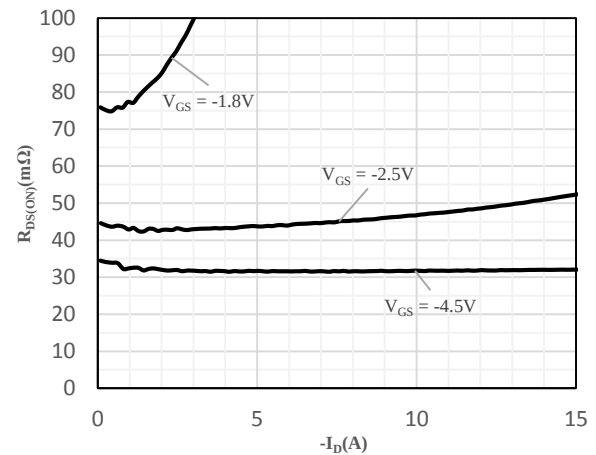


Fig 4 On-Resistance vs. Drain Current
and Gate Voltage

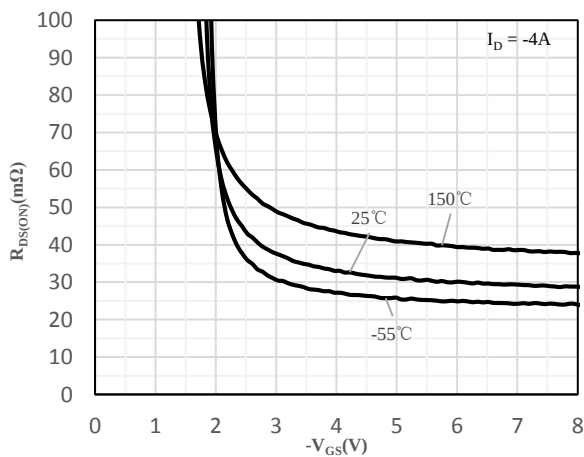


Fig 5 On-Resistance vs. Gate-Source Voltage

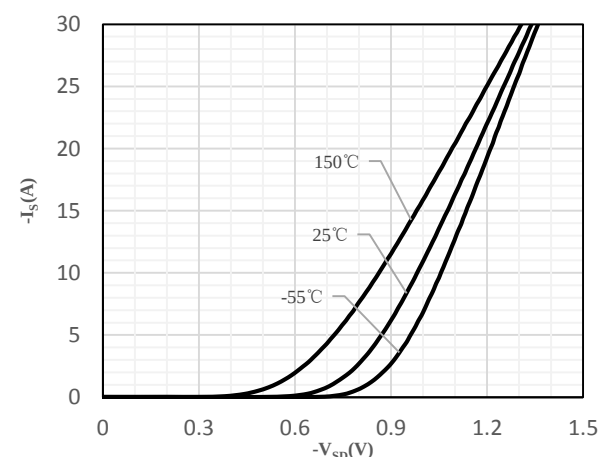


Fig 6 Body-Diode Characteristics

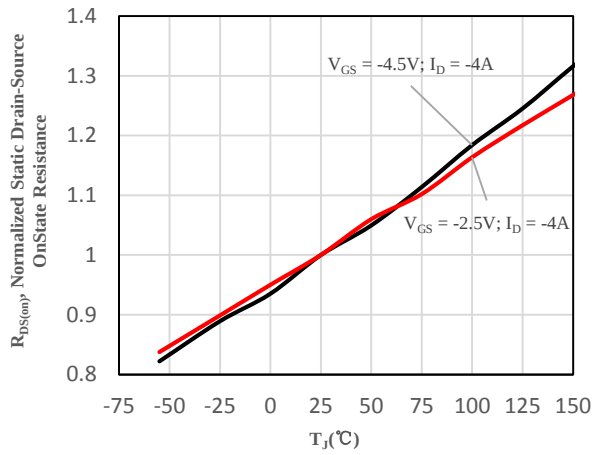


Fig 7 Normalized On-Resistance vs. Junction Temperature

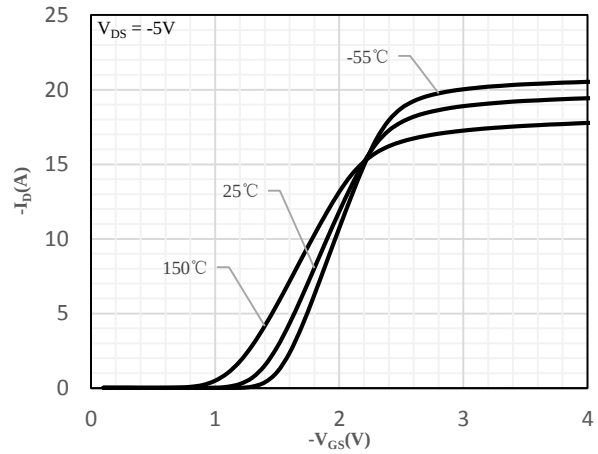


Fig 8 Transfer Characteristics

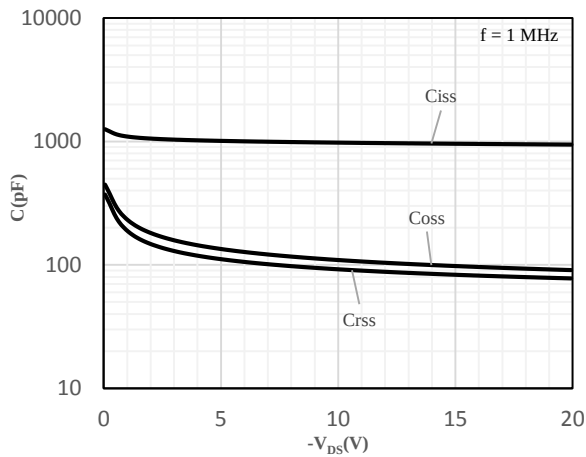


Fig 9 Capacitance Characteristics

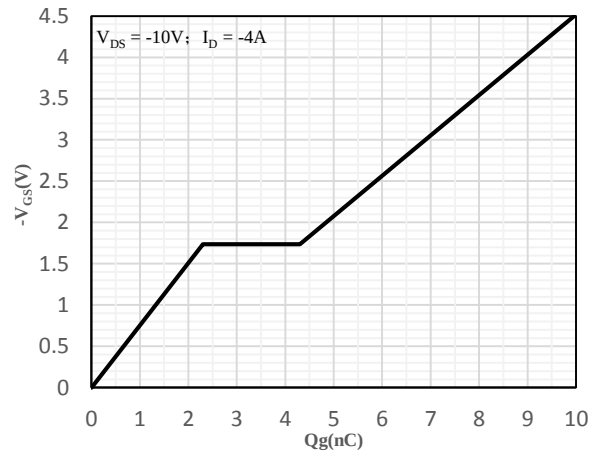


Fig 10 Gate-Charge Characteristics

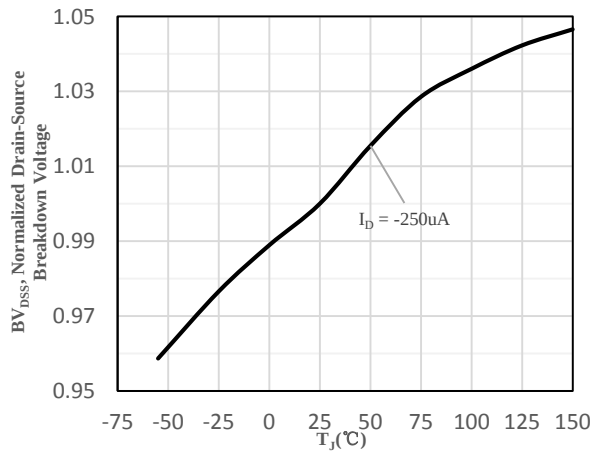


Fig 11 Normalized Breakdown Voltage vs. Junction Temperature

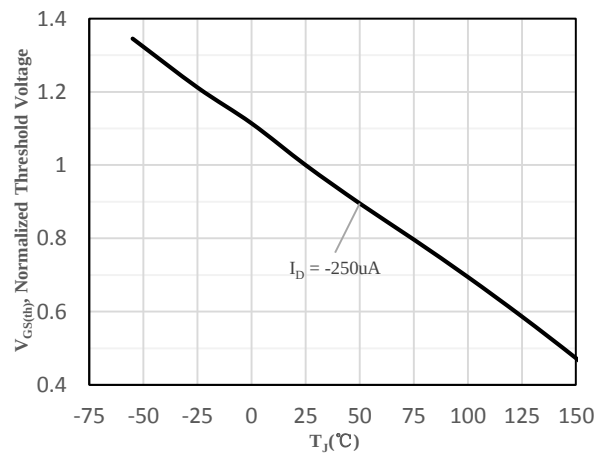
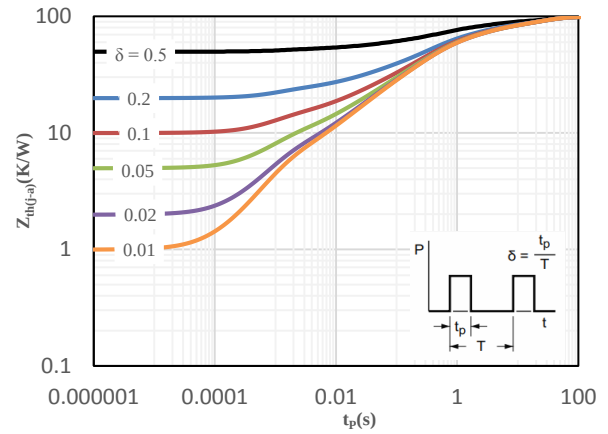
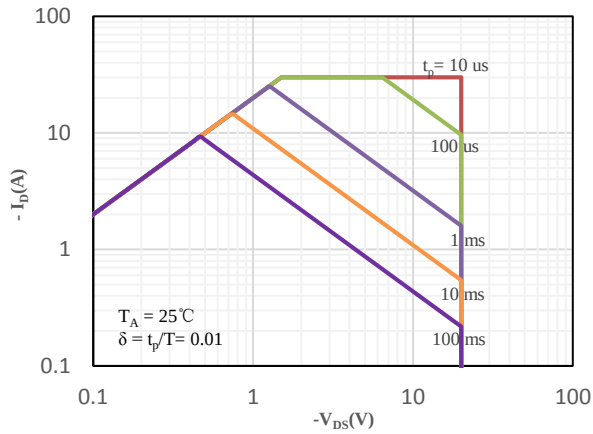
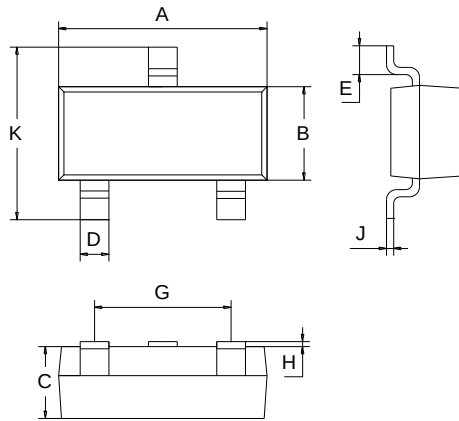


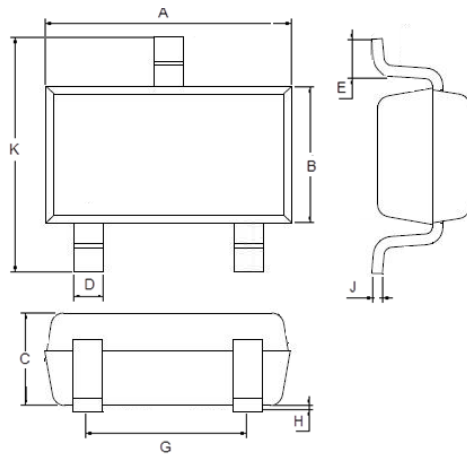
Fig 12 Normalized $V_{GS(th)}$ vs. Junction Temperature



Package Outline Dimensions (Unit: mm)



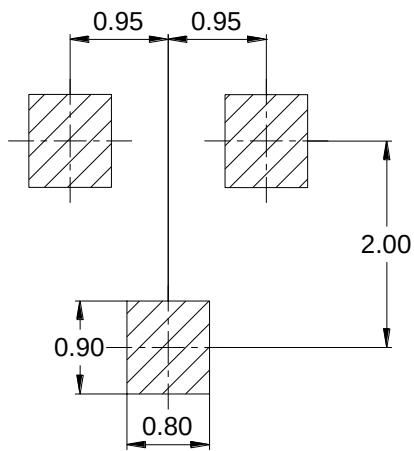
SOT-23		
Dimension	Min.	Max.
A	2.70	3.10
B	1.10	1.50
C	0.90	1.10
D	0.30	0.50
E	0.35	0.48
G	1.80	2.00
H	0.02	0.10
J	0.05	0.15
K	2.20	2.60



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

Mounting Pad Layout (Unit: mm)

SOT-23



SOT-23-3L

