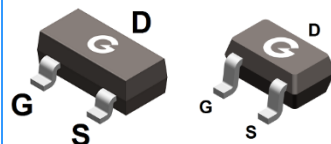


Features

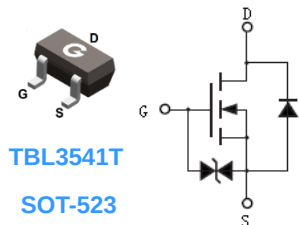
- Advanced planar technology
- Low input capacitance
- High-speed switching
- Drive circuits can be simple
- HBM: AEC-Q101-001: H1C (JESD22-A114-B: 1C)
- RoHS compliant with Halogen-free
- Qualified to AEC-Q101 Standards

HF



TBL3541C
SOT-23

TBL3541W
SOT-323



TBL3541T
SOT-523

Mechanical Data

- Case: SOT-23, SOT-323, SOT-523
- 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
TBL3541C	SOT-23	3000 pcs / Tape & Reel	3541
TBL3541W	SOT-323	3000 pcs / Tape & Reel	3541
TBL3541T	SOT-523	3000 pcs / Tape & Reel	3541

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

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate -Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ($T_A = 25^\circ\text{C}$) ^{*1}	I_D	150	mA
Continuous Drain Current ($T_A = 70^\circ\text{C}$) ^{*1}		120	
Pulsed Drain Current ($t_p = 10\mu\text{s}$, $T_A = 25^\circ\text{C}$)	I_{DM}	600	mA
Power Dissipation ($T_A = 25^\circ\text{C}$, SOT-23) ^{*1}	P_D	350	mW
Power Dissipation ($T_A = 25^\circ\text{C}$, SOT-323) ^{*1}		250	
Power Dissipation ($T_A = 25^\circ\text{C}$, SOT-523) ^{*1}		150	
Operating Junction Temperature Range	T_J	$-55 \sim +150$	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	$-55 \sim +150$	$^\circ\text{C}$

Thermal Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit
Thermal Resistance Junction-to-Air (SOT-23) ^{*1}	$R_{\theta JA}$	-	-	357	$^\circ\text{C/W}$
Thermal Resistance Junction-to-Air (SOT-323) ^{*1}		-	-	500	
Thermal Resistance Junction-to-Air (SOT-523) ^{*1}		-	-	833	

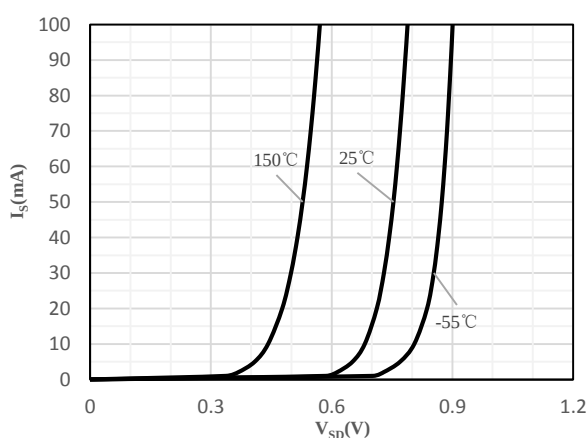
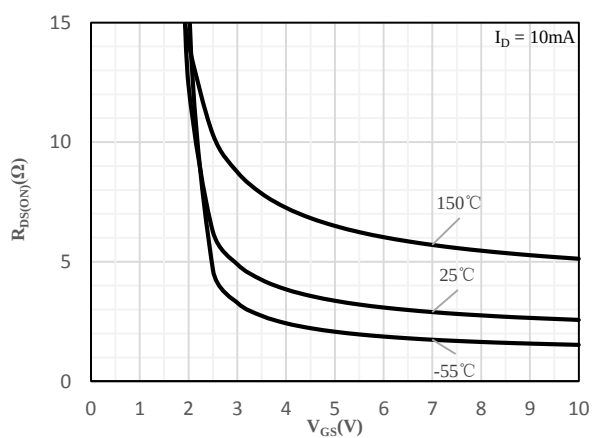
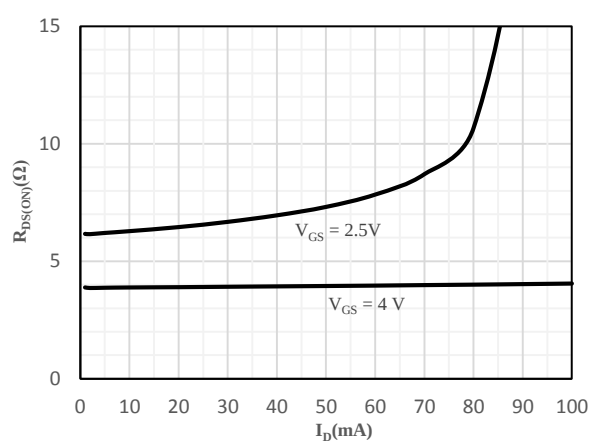
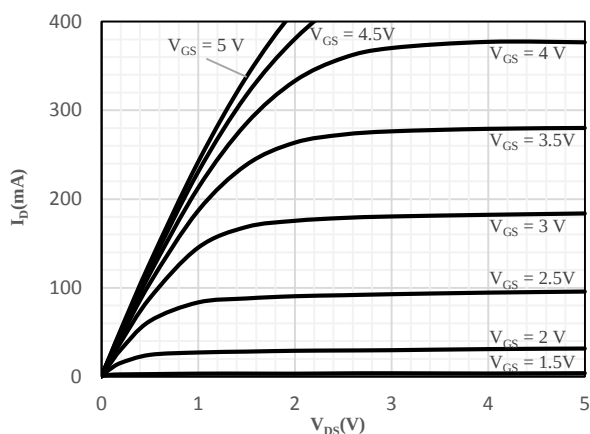
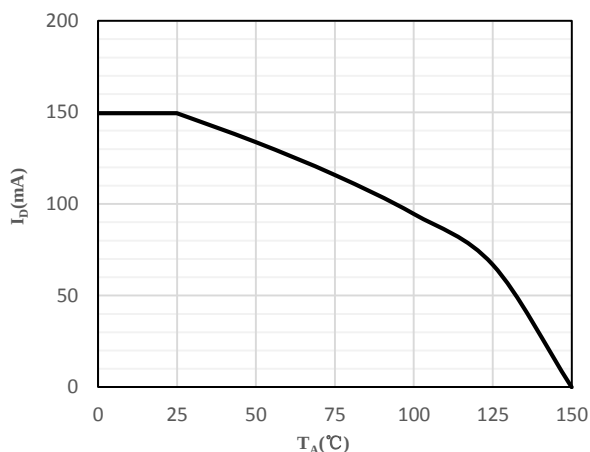
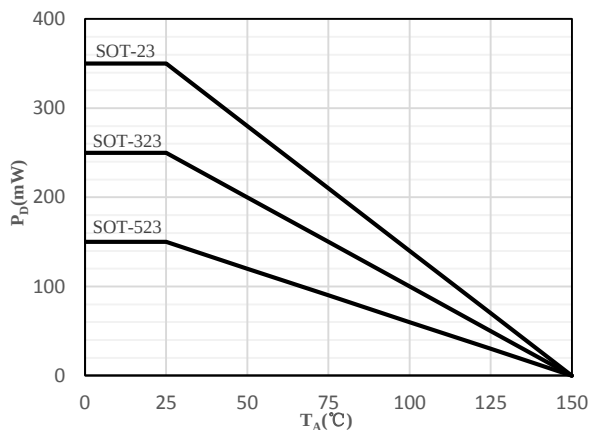
Electrical Characteristics (@ $T_A = 25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
V _{DSS}	Drain-Source Breakdown Voltage	V _{GS} = 0V, I _D = 10μA	30	-	-	V
I _{DSS}	Drain to Source Leakage Current	V _{DS} = 30V, V _{GS} = 0V	-	-	1	μA
I _{GSS}	Gate-body Leakage	V _{GS} = ±20V, V _{DS} = 0V	-	-	±1	μA
On Characteristics						
R _{DS(ON)}	Drain-Source On-resistance *2	V _{GS} = 4V, I _D = 10mA	-	4	8	Ω
		V _{GS} = 2.5V, I _D = 1mA	-	6	13	
V _{GS(TH)}	Gate Threshold Voltage	V _{DS} = 3V, I _D = 100μA	0.8	1.25	1.5	V
R _G	Gate Resistance	V _{GS} = 0V, f = 1MHz	-	288	-	Ω
g _{fs}	Transconductance	V _{DS} = 3V, I _D = 10mA	20	-	-	mS
Dynamic Characteristics						
C _{ISS}	Input Capacitance	V _{GS} = 0V V _{DS} = 5V f = 1.0MHz	-	14	-	pF
C _{OSS}	Output Capacitance		-	11	-	
C _{RSS}	Reverse Transfer Capacitance		-	5	-	
Switching Characteristics						
t _{d(on)}	Turn-on Delay Time *3	V _{DD} = 5V, I _D = 10mA V _{GS} = 5V, R _G = 10Ω R _L = 500Ω	-	15	-	ns
t _r	Turn-on Rise Time *3		-	35	-	
t _{d(off)}	Turn-Off Delay Time *3		-	80	-	
t _f	Turn-Off Fall Time *3		-	80	-	
Source-Drain Diode Characteristics						
V _{SD}	Diode Forward Voltage *2	I _{SD} = 10mA, V _{GS} = 0V	-	0.7	1.2	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 $\leq 300\mu s$, 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)



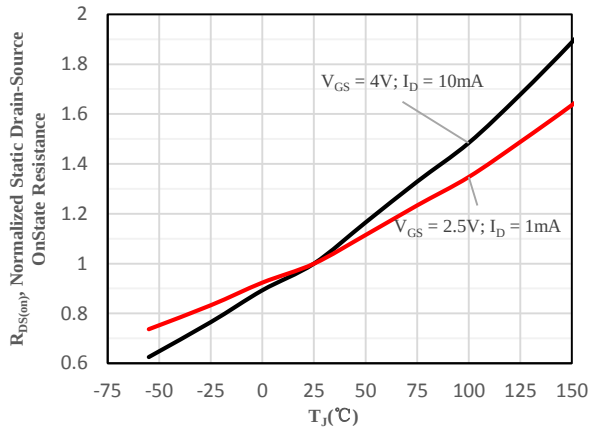


Fig 7 Normalized On-Resistance vs. Junction Temperature

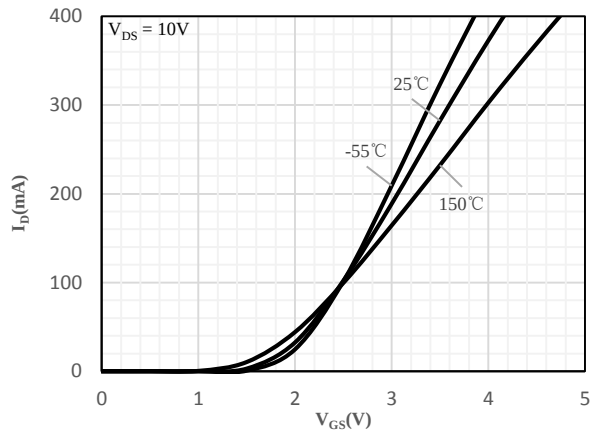


Fig 8 Transfer Characteristics

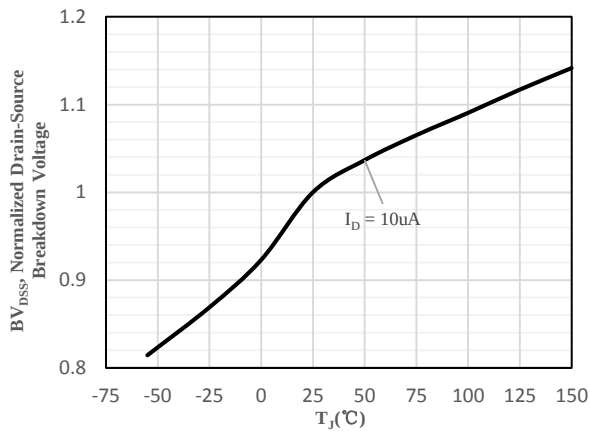


Fig 9 Normalized Breakdown Voltage vs. Junction Temperature

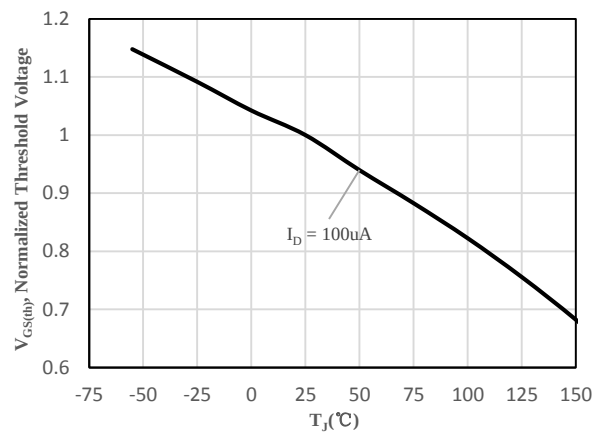


Fig 10 Normalized $V_{GS(th)}$ vs. Junction Temperature

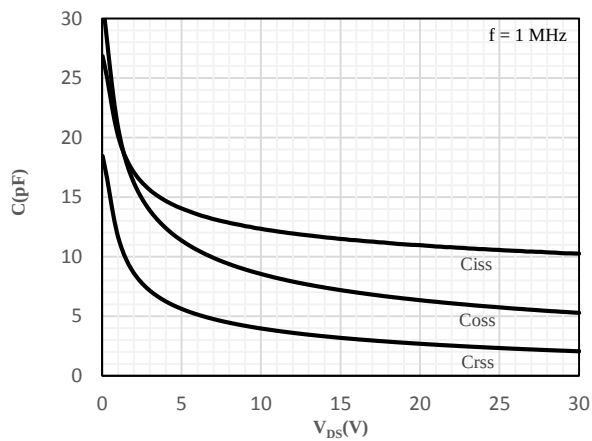


Fig 11 Capacitance Characteristics

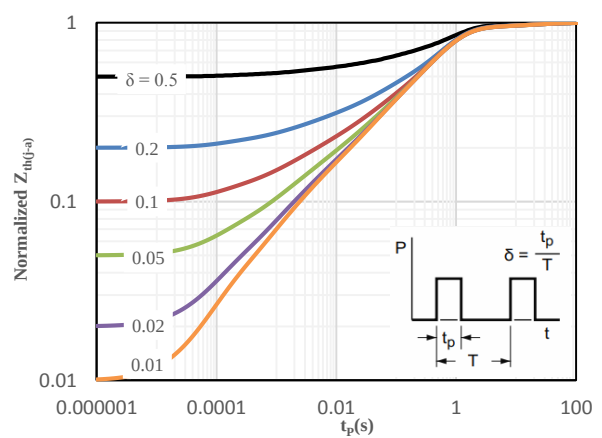
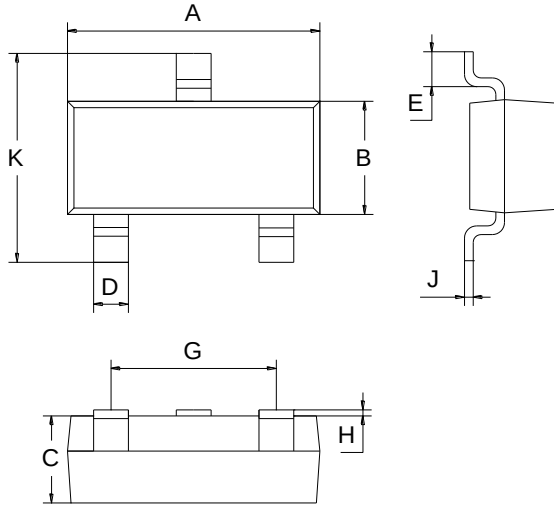
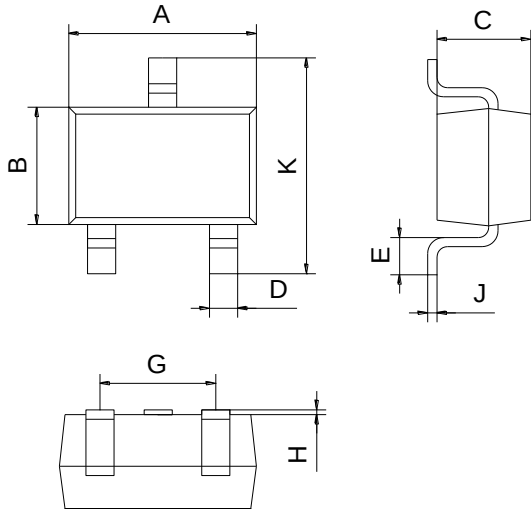


Fig 12 Normalized Maximum transient thermal impedance

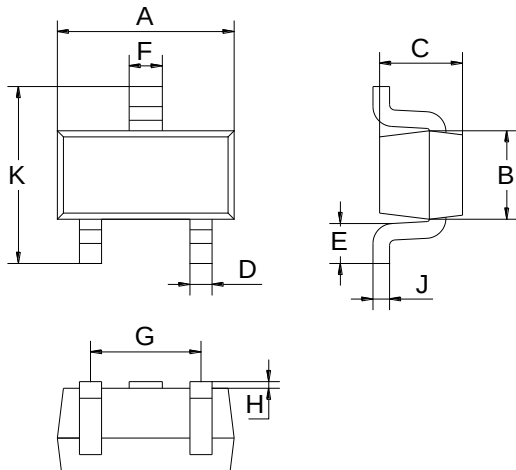
Package Outline Dimensions (Unit: mm)



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



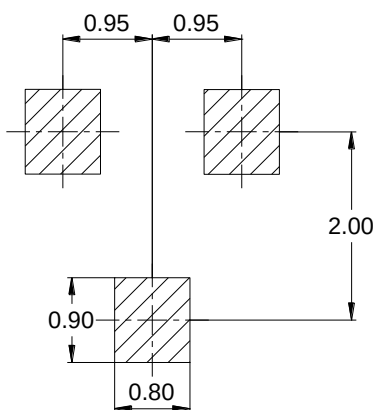
SOT-323		
Dimension	Min.	Max.
A	2.00	2.20
B	1.15	1.35
C	0.90	1.10
D	0.15	0.35
E	0.25	0.40
G	1.20	1.40
H	0.02	0.10
J	0.05	0.15
K	2.20	2.40



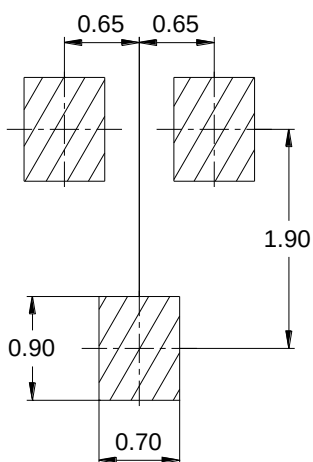
SOT-523		
Dimension	Min.	Max.
A	1.50	1.70
B	0.75	0.85
C	0.60	0.80
D	0.15	0.30
E	0.30	0.40
F	0.25	0.40
G	0.90	1.10
H	0.02	0.10
J	0.08	0.18
K	1.45	1.75

Mounting Pad Layout (Unit: mm)

SOT-23



SOT-323



SOT-523

