

Features

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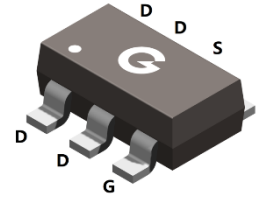
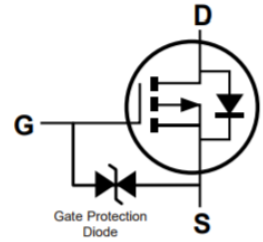
- Electrostatic sensitive devices
- High-speed switching
- Drive circuits can be simple
- Parallel use is easy
- JESD22-A114-B ESD rating of class 3A per human body model
- Halogen free
- Qualified to AEC-Q101 standards for high reliability

Typical Applications

- P-channel enhancement mode effect transistor
- Switching application

Mechanical Data

- Case: SOT-23-6L
- Molding Compound: UL Flammability Classification Rating 94V-0
- Terminals: Matte Tin-Plated Leads, Solderability-per MIL-STD-202, Method 208



SOT-23-6L

Ordering Information

Part Number	Package	Shipping Quantity	Marking Code
TBL3415ES-6L	SOT-23-6L	3000 pcs / Tape & Reel	3415E

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

Parameter	Symbol	Value	Unit
Drain-to-Source Voltage	V_{DSS}	-20	V
Gate-to-Source Voltage	V_{GSS}	± 10	V
Continuous Drain Current ($T_A = 25^\circ\text{C}$)	I_D	-4	A
Continuous Drain Current ($T_A = 70^\circ\text{C}$)		-3.5	A
Pulsed Drain Current ($t_p = 10\mu\text{s}$, $T_A = 25^\circ\text{C}$)	I_{DM}	-20	A
Single Pulse Avalanche Energy ^{*2}	E_{AS}	8.2	mJ

Thermal Characteristics

Parameter	Symbol	Value	Unit
Power Dissipation ($T_A = 25^\circ\text{C}$)	P_D	2	W
Thermal Resistance Junction-to-Air	$R_{\theta JA}$	62.5	$^\circ\text{C/W}$
Operating Junction Temperature Range	T_J	-55 to +150	$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-55 to +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	-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} = ±10V, V _{DS} = 0V	-	-	±10	μA
On Characteristics						
R _{DS(ON)}	Drain-Source On-resistance *1	V _{GS} = -4.5V, I _D = -4A	-	40	50	mΩ
		V _{GS} = -2.5V, I _D = -4A	-	55	70	
		V _{GS} = -1.8V, I _D = -2A	-	78	100	
V _{GS(TH)}	Static Drain-Source On-resistance	V _{DS} = V _{GS} , I _D = -250μA	-0.45	-0.75	-1	V
R _G	Gate Resistance	f = 1.0MHz	-	35	-	Ω
Dynamic Characteristics						
g _{FS}	Forward Transconductance	V _{DS} = -5V, I _D = -4A	8	12	-	S
C _{ISS}	Input Capacitance	V _{GS} = 0V V _{DS} = -10V f = 1.0MHz	-	1181	-	pF
C _{OSS}	Output Capacitance		-	115	-	
C _{RSS}	Reverse Transfer Capacitance		-	101	-	
Switching Characteristics						
Q _G	Total Gate-Charge	V _{DD} = -10V V _{GS} = -4.5V I _D = 4A	-	11	-	nC
Q _{GS}	Gate to Source Charge		-	1.9	-	
Q _{GD}	Gate to Drain (Miller) Charge		-	2.6	-	
Source-Drain Diode Characteristics						
V _{SD}	Diode Forward Voltage *1	I _S = -1A, V _{GS} = 0V	-	-0.8	-1	V

Notes:

- The data tested by pulsed, pulse width $\leq 300\mu\text{s}$, duty cycle $\leq 2\%$
- The E_{AS} data shows Max. rating. The test condition is $V_{DD} = -15\text{V}, V_{GS} = -5\text{V}, L = 0.5\text{mH}$

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

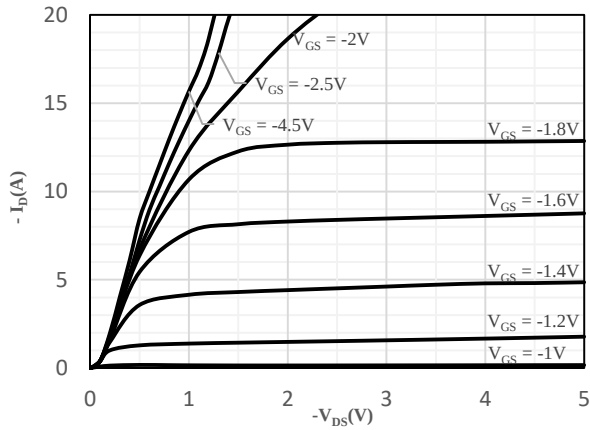


Fig 1 Typical Output Characteristics

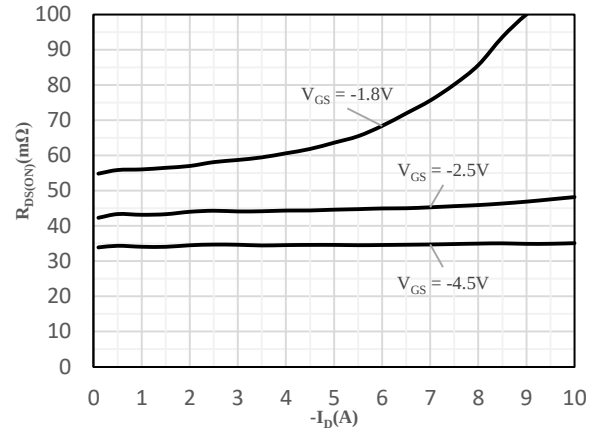


Fig 2 On-Resistance vs. Drain Current and Gate Voltage

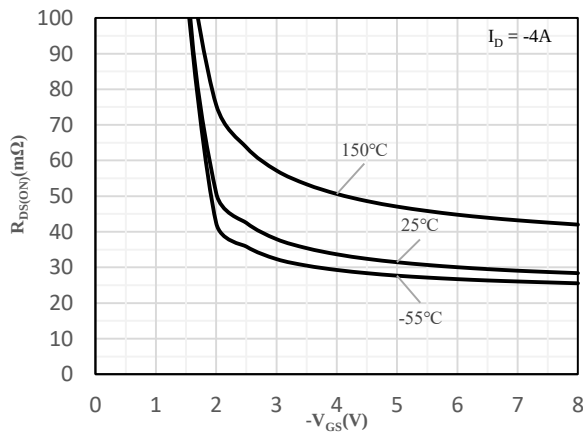


Fig 3 On-Resistance vs. Gate-Source Voltage

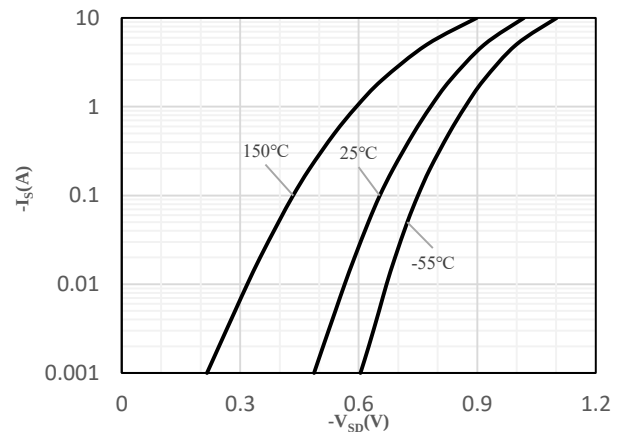


Fig 4 Body-Diode Characteristics

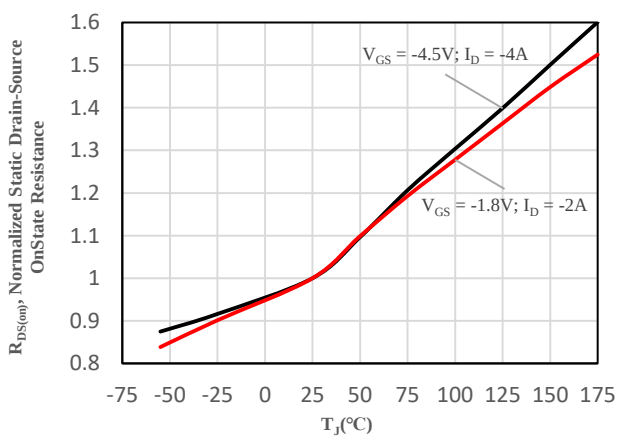


Fig 5 Normalized On-Resistance vs. Junction Temperature

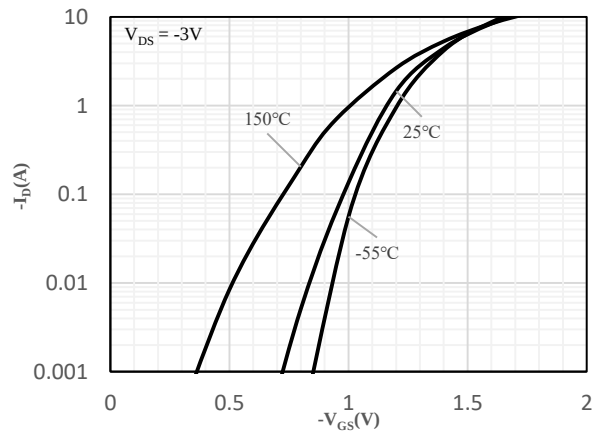


Fig 6 Transfer Characteristics

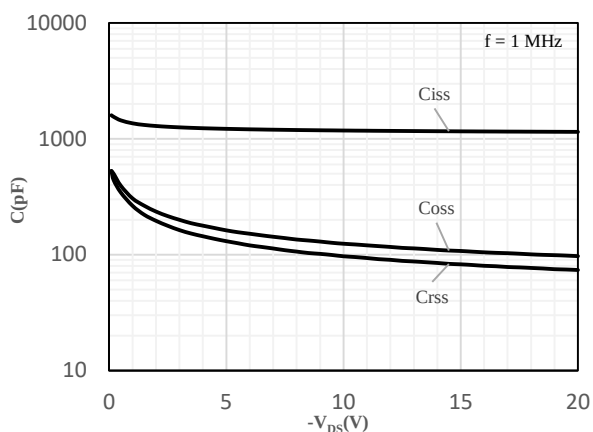


Fig 7 Capacitance Characteristics

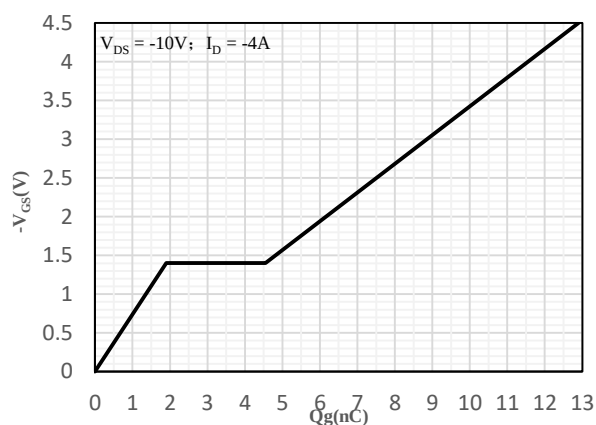


Fig 8 Gate-Charge Characteristics

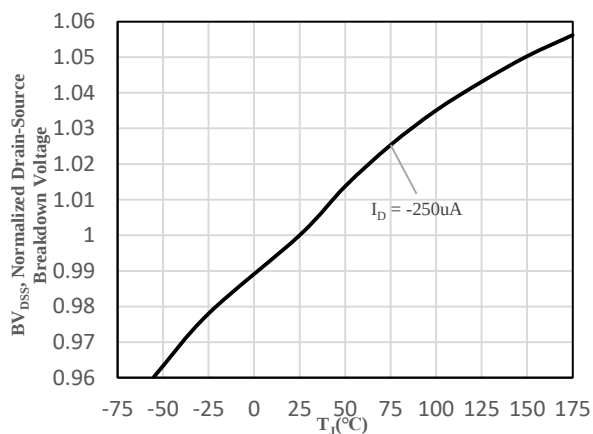


Fig 9 Normalized Breakdown Voltage
vs. Junction Temperature

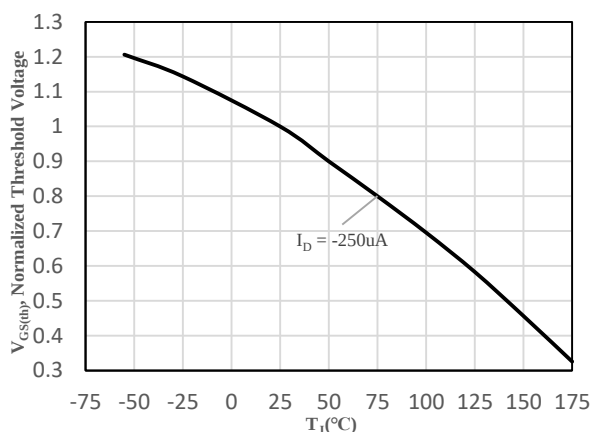
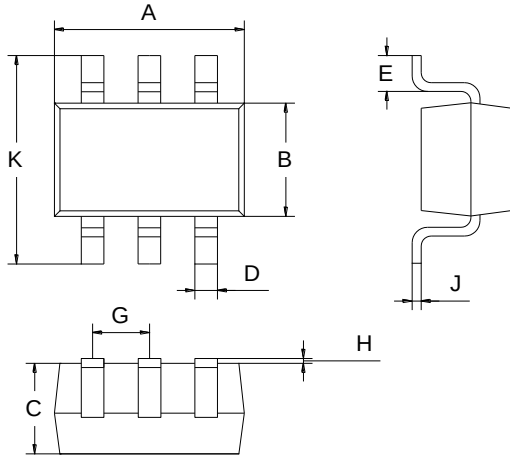


Fig 10 Normalized $V_{GS(th)}$ vs. Junction Temperature

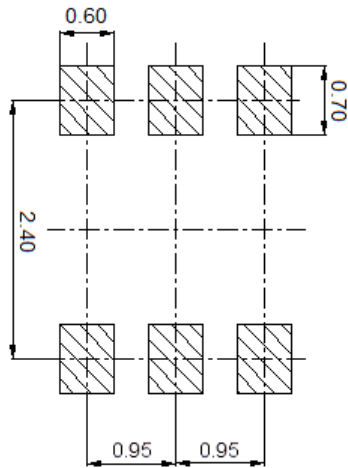
Package Outline Dimensions (Unit: mm)



SOT-23-6L		
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	0.90	1.00
H	0.02	0.10
J	0.10	0.20
K	2.60	3.00

Mounting Pad Layout (Unit: mm)

SOT-23-6L



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