

Features

- N-Channel switch with low $R_{DS(on)}$
- Operated at low logic level gate drive
- RoHS compliant with Halogen-free

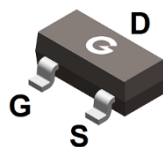
HF

Typical Applications

- N-channel enhancement mode effect transistor
- Switching application

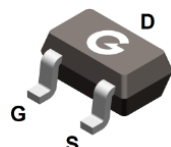
Mechanical Data

- Case: SOT-23, SOT-323, SOT-523, DFN1006-3, SOT-723
- Molding Compound: UL Flammability Classification Rating 94V-0
- Terminals: Matte tin-plated leads; solderability-per MIL-STD-202, Method 208



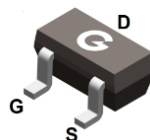
BL1014

SOT-23



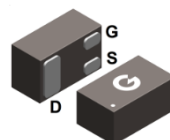
BL1014W

SOT-323



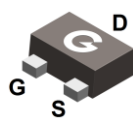
BL1014T

SOT-523



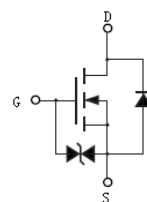
BL1014L

DFN1006-3



BL1014M

SOT-723



Ordering Information

Part Number	Package	Shipping	Marking Code
BL1014	SOT-23	3000pcs / Tape & Reel	KM
BL1014W	SOT-323	3000pcs / Tape & Reel	KM
BL1014T	SOT-523	3000pcs / Tape & Reel	KM
BL1014L	DFN1006-3	10000pcs / Tape & Reel	KM
BL1014M	SOT-723	10000pcs / Tape & Reel	KM

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

Parameter	Symbol	Value	Units
Drain-Source Voltage	V_{DSS}	30	V
Gate -Source Voltage	V_{GSS}	± 12	V
Continuous Drain Current ^{*1}	I_D	0.6	A
Pulsed Drain Current ($t_p = 10\mu\text{s}$)	I_{DM}	1.8	A
Single Pulse Avalanche Energy ^{*3}	E_{AS}	2	mJ
Power Dissipation ^{*1}	SOT-23	0.35	W
	SOT-323	0.20	
	SOT-523	0.15	
	DFN1006-3	0.15	
	SOT-723	0.15	

Thermal Characteristics

Parameter		Symbol	Limits	Unit
Thermal Resistance Junction to Ambient Air *1	SOT-23	$R_{\theta JA}$	357	°C/W
	SOT-323		500	
	SOT-523		833	
	DFN1006-3		833	
	SOT-723		833	
Thermal Resistance Junction to Case *1	SOT-23	$R_{\theta JC}$	195	°C/W
	SOT-323		261	
	SOT-523		434	
	DFN1006-3		434	
	SOT-723		434	
Operating Junction Temperature Range		T_J	-55 to +150	°C
Storage Temperature Range		T_{STG}	-55 to +150	°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} = 30V, V _{GS} = 0V	-	-	1	μA
I _{GSS}	Gate-Body Leakage Current	V _{GS} = ±10V, V _{DS} = 0V	-	-	±3	μA
On Characteristics						
R _{DS(ON)}	Drain-Source On-resistance *2	V _{GS} = 4.5V, I _D = 0.6A	-	335	420	mΩ
		V _{GS} = 2.5V, I _D = 0.3A	-	404	540	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = 250μA	0.5	0.95	1.5	V
R _G	Gate Resistance	V _{GS} = 0V, f = 1MHz	-	64	-	Ω
Dynamic Characteristics						
C _{ISS}	Input Capacitance	V _{GS} = 0V V _{DS} = 10V f = 1.0MHz	-	73	-	pF
C _{OSS}	Output Capacitance		-	29	-	
C _{RSS}	Reverse Transfer Capacitance		-	16	-	
Switching Characteristics						
t _{d(ON)}	Turn-on Delay Time *4	V _{DS} = 15V V _{GS} = 4.5V R _G = 51Ω I _D = 0.7A	-	5	-	ns
t _r	Turn-on Rise Time *4		-	8.2	-	
t _{d(OFF)}	Turn-Off Delay Time *4		-	23	-	
t _f	Turn-Off Fall Time *4		-	41	-	
Q _G	Total Gate-Charge	V _{DS} = 15V V _{GS} = 4.5V I _D = 0.8A	-	2.23	-	nC
Q _{GS}	Gate to Source Charge		-	0.63	-	
Q _{GD}	Gate to Drain (Miller) Charge		-	0.38	-	
Source-Drain Diode Characteristics						
V _{SD}	Diode Forward Voltage *2	I _{SD} = 0.6A, V _{GS} = 0V	-	0.9	1.2	V

Notes:

- The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper
- The data tested by pulsed, pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$
- The E_{AS} data shows Max. rating. The test condition is $V_{DD} = 15V, V_{GS} = 6V, L = 10mH$
- Guaranteed by design, not subject to production

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

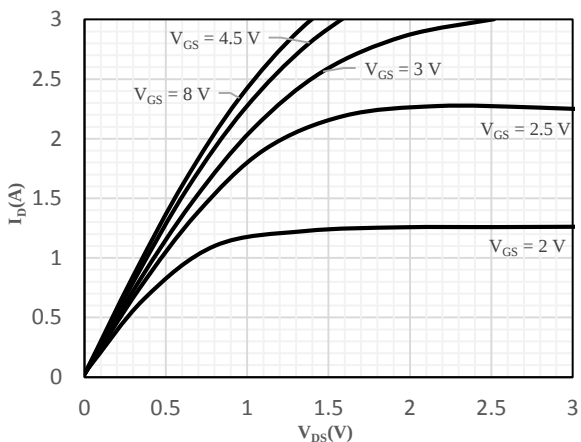


Fig 1 Output Characteristics

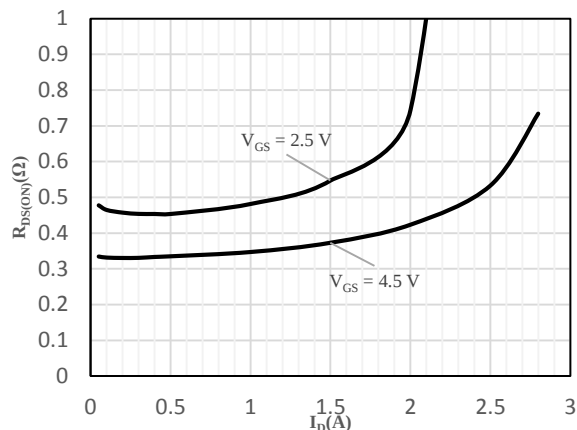


Fig 2 On-Resistance vs. Drain Current and Gate Voltage

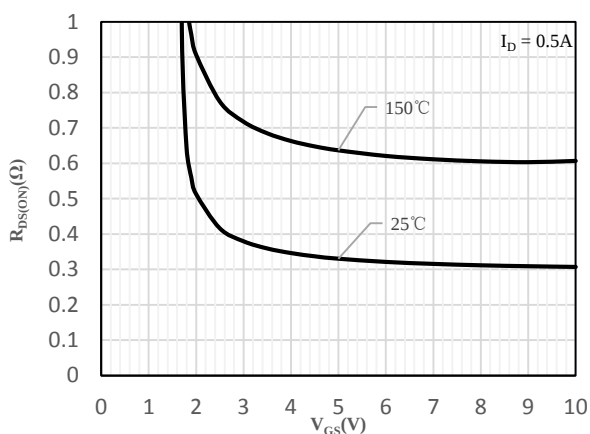


Fig 3 On-Resistance vs. Gate-Source Voltage

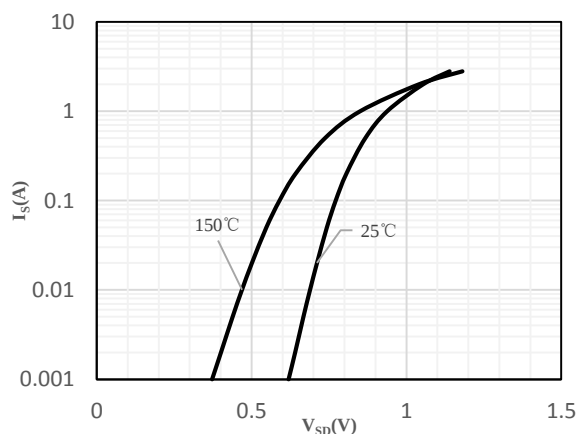


Fig 4 Body-Diode Characteristics

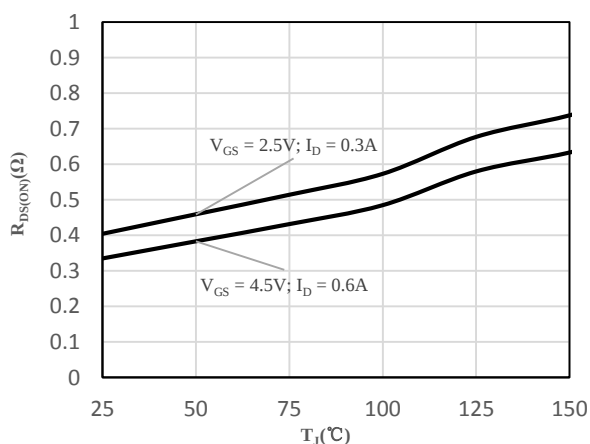


Fig 5 On-Resistance vs. Junction Temperature

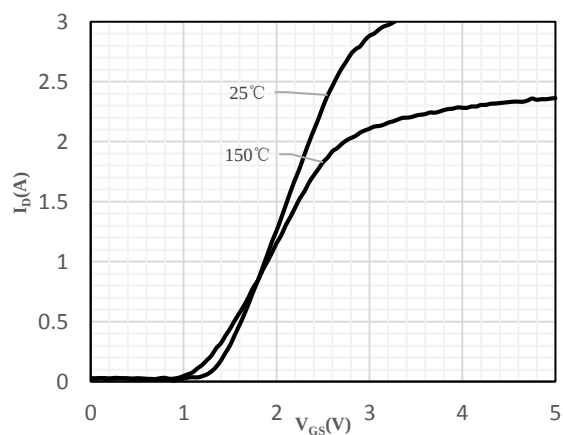


Fig 6 Transfer Characteristics

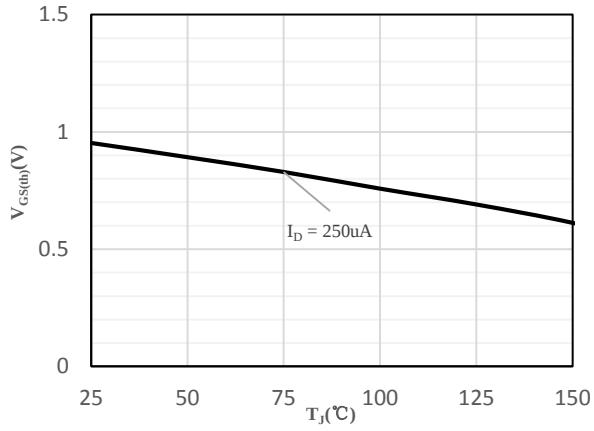


Fig 7 $V_{GS(th)}$ vs. Junction Temperature

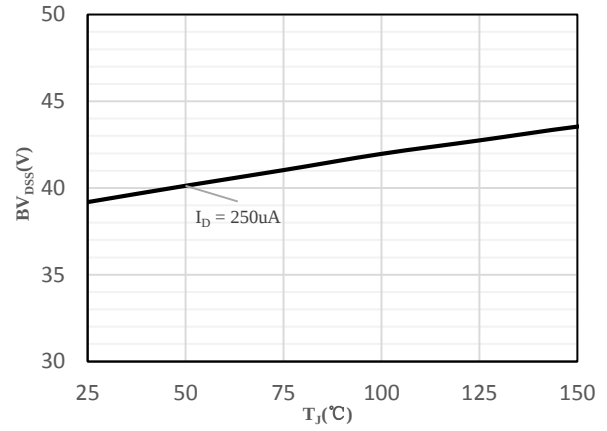


Fig 8 Breakdown Voltage vs. Junction Temperature

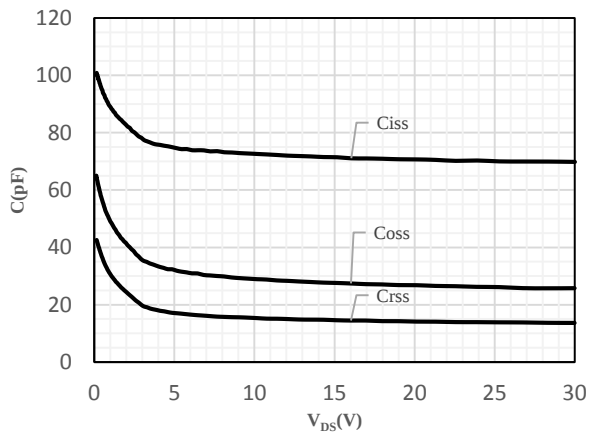


Fig 9 Capacitance Characteristics

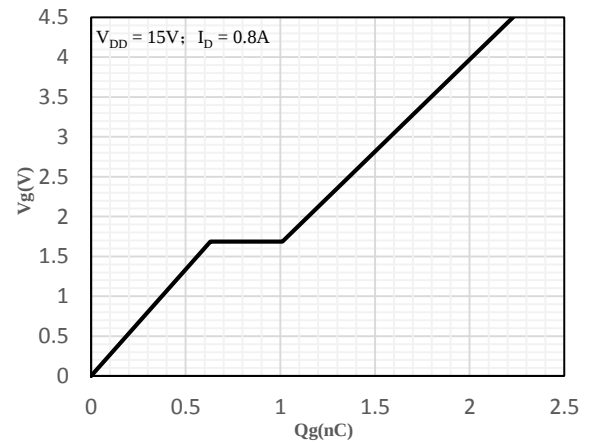
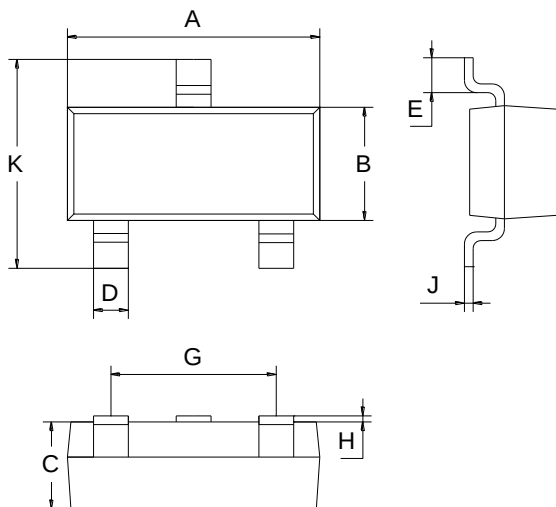
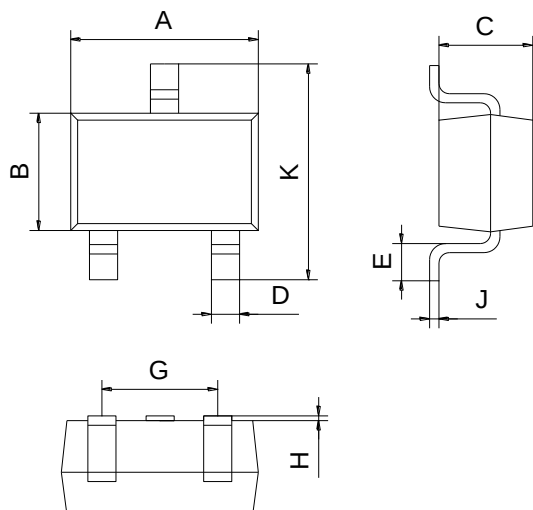


Fig 10 Gate-Charge Characteristics

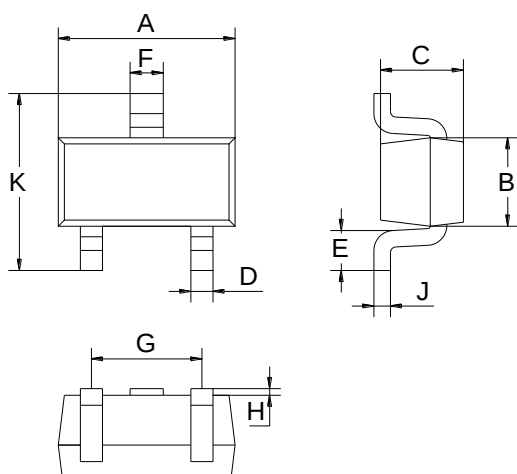
Package Outline Dimensions (Unit: mm)



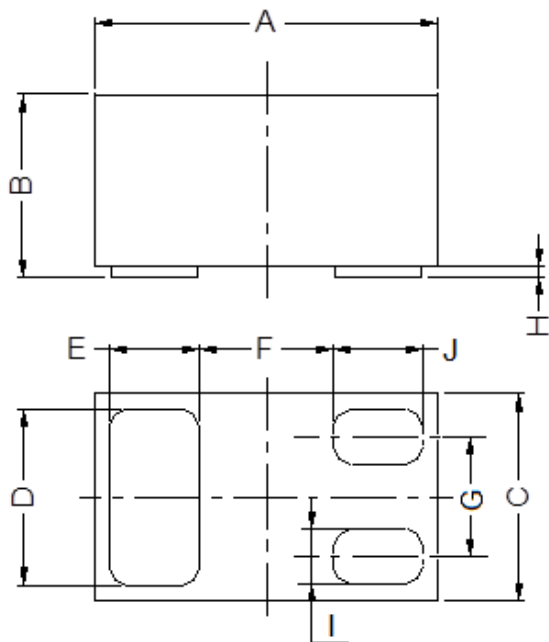
SOT-23		
Dimension	Min.	Max.
A	2.70	3.10
B	1.10	1.50
C	0.90	1.10
D	0.30	0.50
E	0.35	0.48
G	1.80	2.00
H	0.02	0.10
J	0.05	0.15
K	2.20	2.60



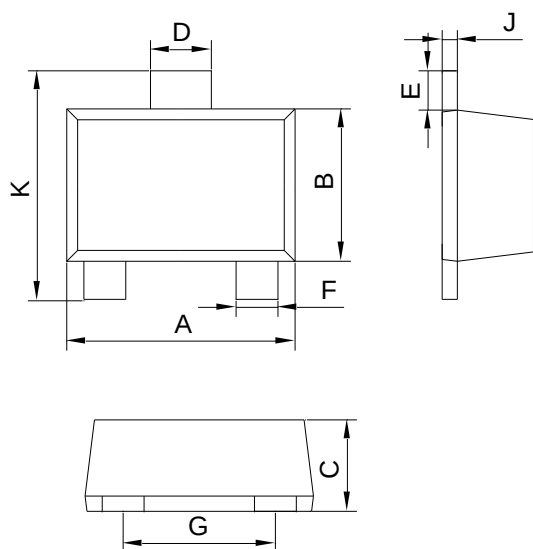
SOT-323		
Dimension	Min.	Max.
A	2.00	2.20
B	1.15	1.35
C	0.90	1.10
D	0.15	0.35
E	0.25	0.40
G	1.20	1.40
H	0.02	0.10
J	0.05	0.15
K	2.20	2.40



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



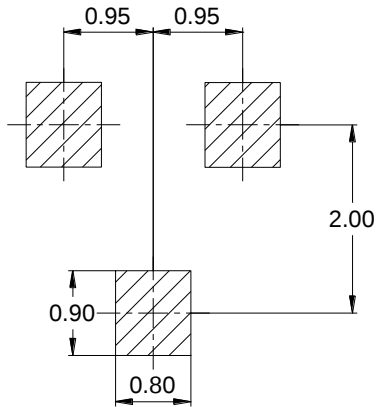
DFN1006-3			
Dimension	Min.	Typ.	Max.
A	0.95	1.00	1.075
B	0.47	0.50	0.53
C	0.55	0.60	0.675
D	0.45	0.50	0.55
E/J	0.20	0.25	0.30
F	-	0.40	-
G	-	0.35	-
H	0	0.03	0.05
I	0.10	0.15	0.20



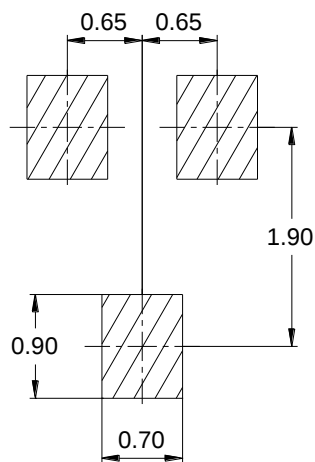
SOT-723		
Dim	Min	Max
A	1.10	1.30
B	0.70	0.90
C	0.40	0.54
D	0.22	0.42
E	0.10	0.30
F	0.12	0.32
G	0.70	0.90
J	0.08	0.15
K	1.10	1.30

Mounting Pad Layout (Unit: mm)

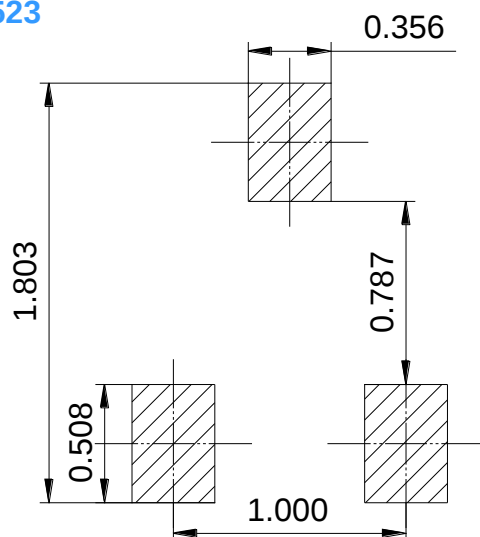
SOT-23



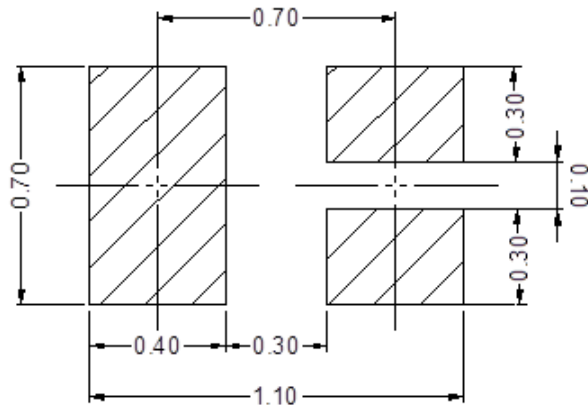
SOT-323



SOT-523



DFN1006-3



SOT-723

