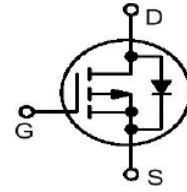


Features

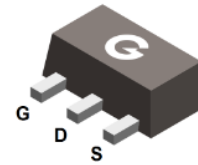
- $R_{DS(ON)} \leq 52m\Omega @ V_{GS} = -10V$
- $R_{DS(ON)} \leq 87m\Omega @ V_{GS} = -4.5V$
- High-speed switching
- Drive circuits can be simple
- Parallel use is easy
- JESD22-A114-B ESD rating of class 0 per human body model

HF



Typical Applications

- Power Management in Note Book
- Switching Application
- Battery Powered System
- Load switch



Mechanical Data

- Case: SOT-89
- Molding Compound, UL Flammability Classification Rating 94V-0
- Terminals: Matte Tin Plated Leads, Solderable Per MIL-STD-202, Method 208

SOT-89

Ordering Information

Part Number	Package	Shipping Quantity	Marking Code
BL3407E	SOT-89	1000 pcs / Tape & Reel	3407

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

Parameter		Symbol	Value	Unit
Drain-Source Voltage		V _{DSS}	-30	V
Gate -Source Voltage		V _{GSS}	±20	V
Continuous Drain Current	T _A = 25°C	I _D	-5.3	A
	T _A = 70°C		-4.2	A
Pulsed Drain Current (t _p = 10μs, T _A = 25°C)		I _{DM}	-20	A
Single Pulse Avalanche Energy *3		E _{AS}	12	mJ
Power Dissipation	T _A = 25°C	P _D	2	W
	T _C = 25°C		4	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-Case	$R_{\theta JC}$	-	20	30	$^{\circ}\text{C/W}$
Thermal Resistance Junction-to-Air ^{*1}	$R_{\theta JA}$	-	45	60	$^{\circ}\text{C/W}$

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	-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} = ±20V, V _{DS} = 0V	-	-	±100	nA
On Characteristics						
R _{DS(ON)}	Drain-Source On-resistance *2	V _{GS} = -10V, I _D = -4.1A	-	-	52	mΩ
		V _{GS} = -4.5V, I _D = -3A	-	-	87	mΩ
V _{GS(th)}	Gate Threshold Voltage	V _{DS} = V _{GS} , I _D = -250μA	-1	-1.5	-3	V
R _G	Gate Resistance	V _{GS} = 0V, f = 1MHz	-	12	-	Ω
Dynamic Characteristics						
g _{FS}	Forward Transconductance	V _{DS} = -5V, I _D = -4A	-	7	-	S
C _{ISS}	Input Capacitance	V _{GS} = 0V V _{DS} = -15V f = 1.0MHz	-	793	-	pF
C _{OSS}	Output Capacitance		-	78	-	
C _{RSS}	Reverse Transfer Capacitance		-	61	-	
Switching Characteristics						
t _{d(ON)}	Turn-on Delay Time *4	V _{DD} = -15V, V _{GS} = -10V R _G = 2.5Ω, R _L = 15Ω I _D = -1A	-	5	-	ns
t _r	Turn-on Rise Time *4		-	6	-	
t _{d(OFF)}	Turn-Off Delay Time *4		-	28	-	
t _f	Turn-Off Fall Time *4		-	7	-	
Q _G	Total Gate-Charge	V _{DD} = -20V	-	8	-	nC
Q _{GS}	Gate to Source Charge	V _{GS} = -4.5V	-	2.6	-	
Q _{GD}	Gate to Drain (Miller) Charge	I _D = -3A	-	2.6	-	
Source-Drain Diode Characteristics						
V _{SD}	Diode Forward Voltage *2	I _{SD} = -1A, V _{GS} = 0V, T _J = 25°C	-	-0.8	-1.0	V
t _{rr}	Reverse Recovery Time	I _{SD} = -3A, V _{GS} = 0V	-	125	-	ns
Q _{rr}	Reverse Recovery Charge	dI/dt = 100A/μs	-	110	-	nC

Notes:

- The data tested by surface mounted on a 1 inch² FR-4 board with 20Z copper
- 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 $V_{DD} = -15\text{V}, V_{GS} = -10\text{V}, L = 0.1\text{mH}$
- Guaranteed by design, not subject to production

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

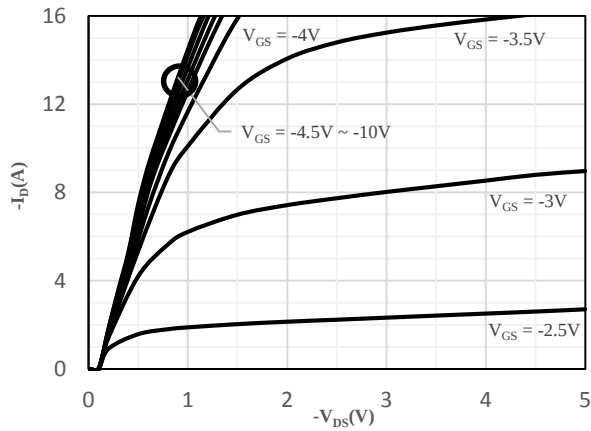


Fig 1 Typical Output Characteristics

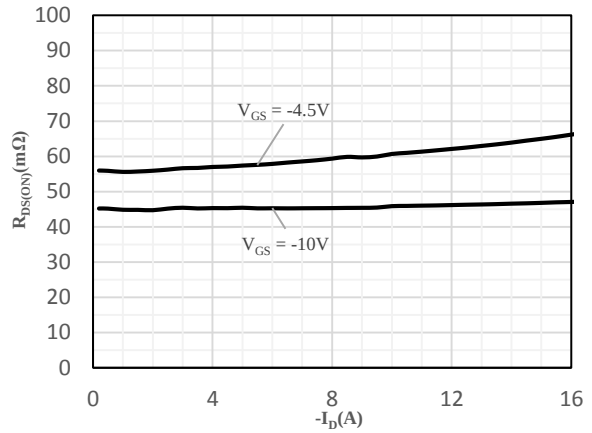


Fig 2 On-Resistance vs. Drain Current
and Gate Voltage

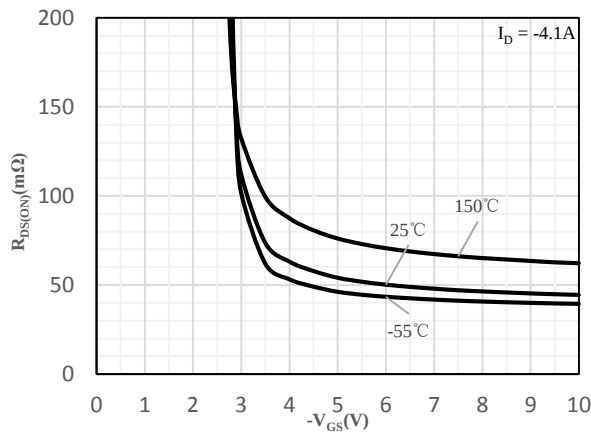


Fig 3 On-Resistance vs. Gate-Source Voltage

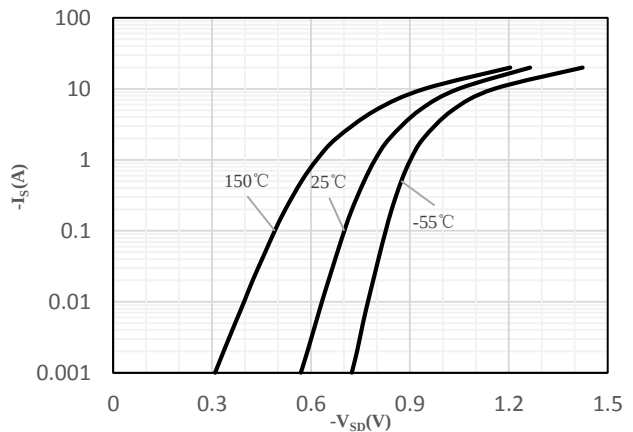


Fig 4 Body-Diode Characteristics

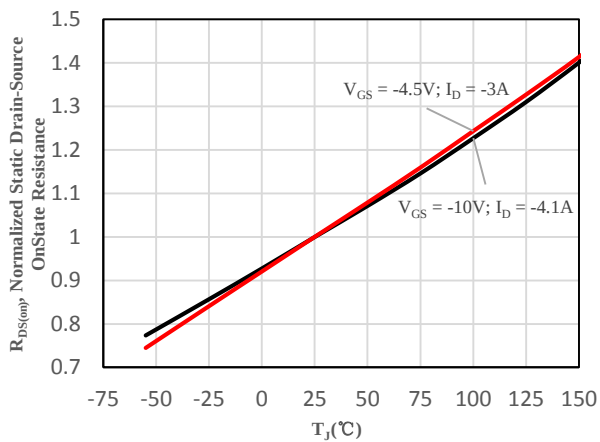


Fig 5 Normalized On-Resistance vs. Junction
Temperature

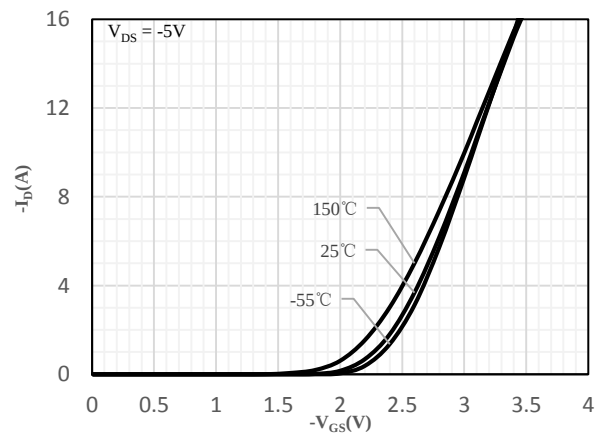


Fig 6 Transfer Characteristics

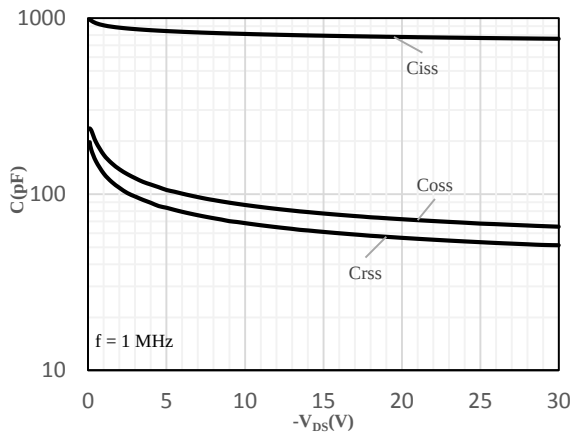


Fig 7 Capacitance Characteristics

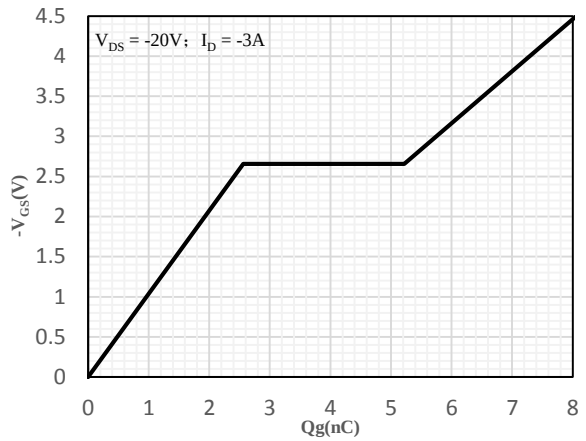


Fig 8 Gate-Charge Characteristics

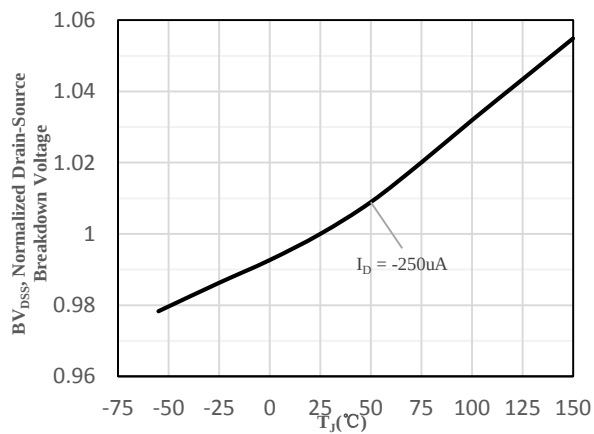


Fig 9 Normalized Breakdown Voltage
vs. Junction Temperature

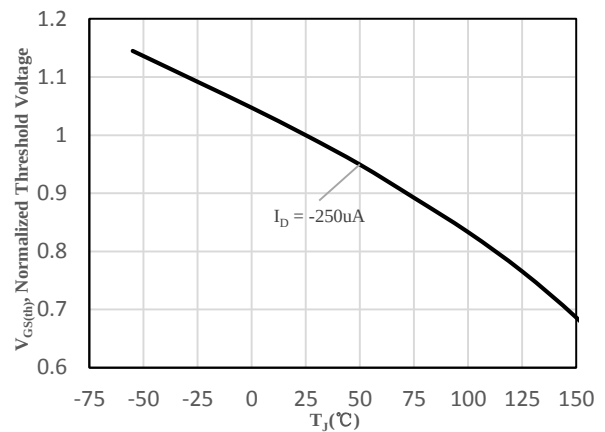


Fig 10 Normalized $V_{GS(th)}$ vs. Junction Temperature

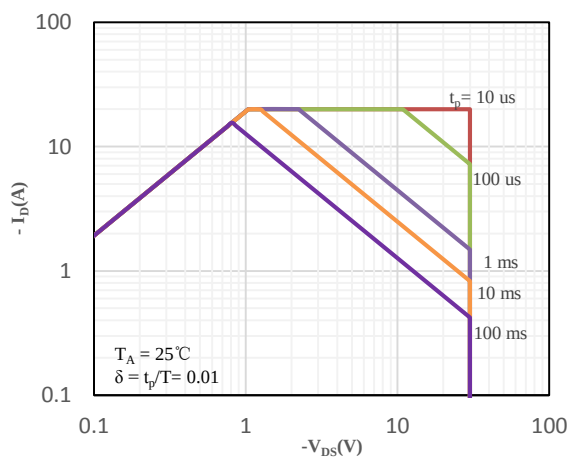


Fig 11 Safe Operation Area

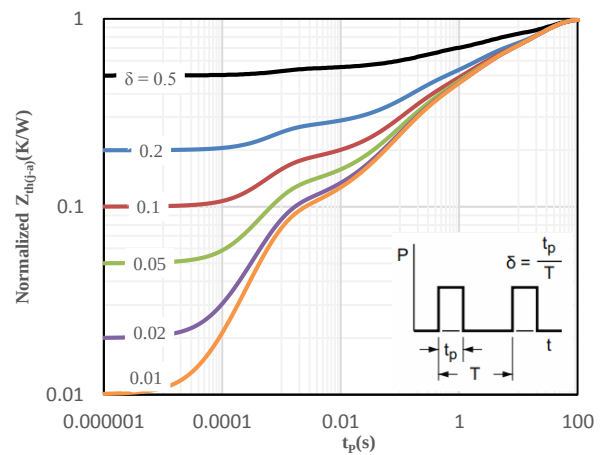
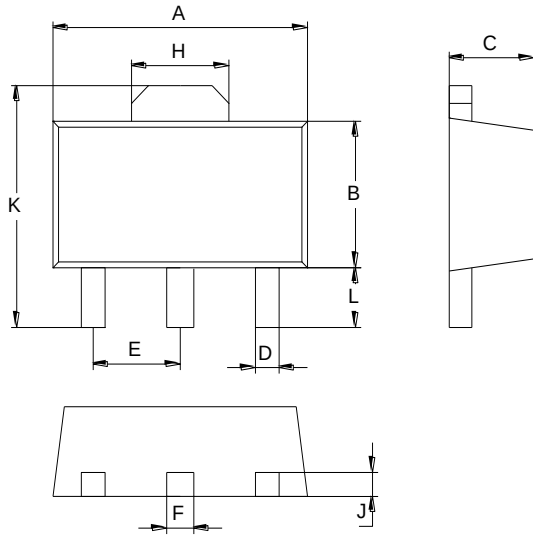


Fig 12 Normalized Maximum transient thermal
impedance

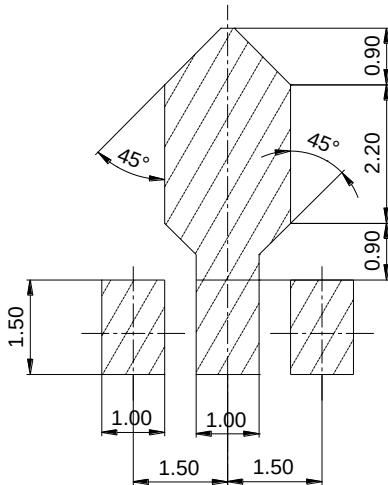
Package Outline Dimensions (Unit: mm)



SOT-89		
Dimension	Min.	Max.
A	4.30	4.70
B	2.25	2.65
C	1.30	1.70
D	0.30	0.50
E	1.40	1.60
F	0.38	0.58
H	1.60	1.80
J	0.30	0.50
L	0.90	1.10
K	3.95	4.35

Mounting Pad Layout (Unit: mm)

SOT-89



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