

P-Channel High Density Trench MOSFET

BL3401

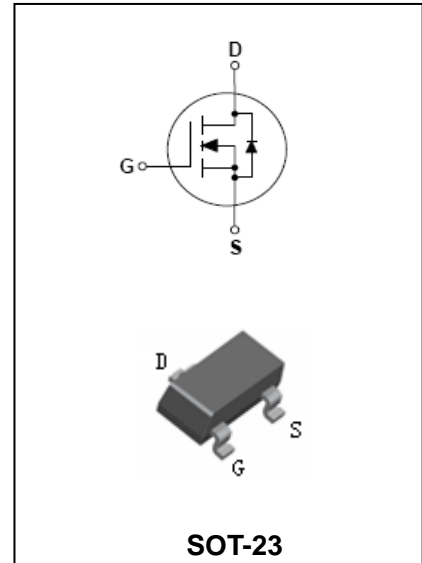
FEATURES

- Super high dense cell trench design for low $R_{DS(ON)}$.
- Rugged and Reliable.
- Electrostatic Sensitive Devices.



APPLICATIONS

- P-channel enhancement mode effect transistor.
- Switching application.



ORDERING INFORMATION

Type No.	Marking	Package Code
BL3401	3401	SOT-23

MAXIMUM RATING @ Ta=25°C unless otherwise specified

Symbol	Parameter	Value	Units
V_{DSS}	Drain-Source voltage	-30	V
V_{GSS}	Gate -Source voltage	± 12	V
I_D I_{DM}	Drain Current-Continuous ^a @ TA = 25 °C -Pulse ^b	-4.2 -16	A
I_S	Drain-Source Diode Forward Current ^a	-2.2	A
P_D	Power Dissipation	1.25	W
$R_{\theta JA}$	Thermal resistance, Junction-to-Ambient	75	°C/W
T_J, T_{stg}	Junction and Storage Temperature	-55 to +150	°C

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ELECTRICAL CHARACTERISTICS @ Ta=25°C unless otherwise specified

Parameter	Symbol	Test conditions	MIN	TYP	MAX	UNIT
STATIC PARAMETERS						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=-250\mu A$	-30	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-20V, V_{GS}=0V$	-	-	-1	μA
Gate-body Leakage	I_{GSS}	$V_{DS}=0V, V_{GS}=-12V$	-	-	-100	nA
ON CHARACTERISTICS^b						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-0.7	-1.0	-1.3	V
Static drain-Source on-resistance	$R_{DS(on)}$	$V_{GS}=-10V, I_D=-4.2A$	-	37	50	m Ω
		$V_{GS}=-4.5V, I_D=-4.0A$	-	36	65	
		$V_{GS}=-2.5V, I_D=-1.0A$	-	67	120	
DRAIN-SOURCE DIODE CHARACTERISTICS^b						
Drain-Source diode forward voltage	V_{SD}	$V_{GS}=0V, I_D=-1A$	-	-	-1.0	V
DYNAMIC CHARACTERISTICS^c						
Input capacitance	C_{ISS}	$V_{DS}=15V, V_{GS}=0V, f=1.0MHz$	-	1325	-	pF
Output capacitance	C_{OSS}		-	172	-	
Reverse transfer capacitance	C_{RSS}		-	140	-	
SWITCHING CHARACTERISTICS^c						
Turn-On Delay Time	$t_{D(ON)}$	$V_{DS} = -15V, I_D = -1A$ $R_L = 15\Omega, V_{GEN} = -4.5V,$ $R_{GEN} = 10\Omega$	-	5	-	ns
Rise Time	t_r		-	3	-	ns
Turn-Off Delay Time	$t_{D(OFF)}$		-	30	-	ns
Fall Time	t_f		-	10	-	ns
Total Gate Charge	Q_g	$V_{DS} = -15V$	-	27.8	-	nC
Gate-Source Charge	Q_{gs}	$I_D = -1A$	-	3.2	-	nC
Gate-Drain Charge	Q_{gd}	$V_{GS} = -10V,$	-	2.72	-	nC

NOTE:

- b. Pulse Test: Pulse width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.
 C. Guaranteed by design , not subject to production testing .

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TYPICAL CHARACTERISTICS @ Ta=25°C unless otherwise specified

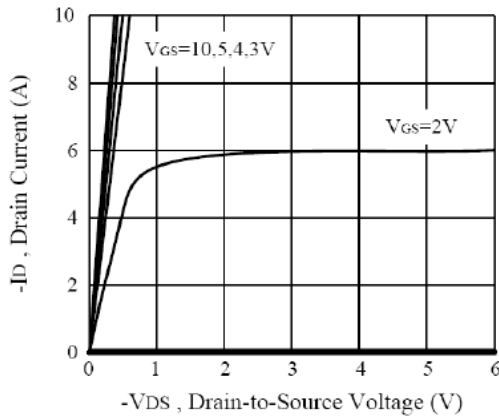


Figure 1. Output Characteristics

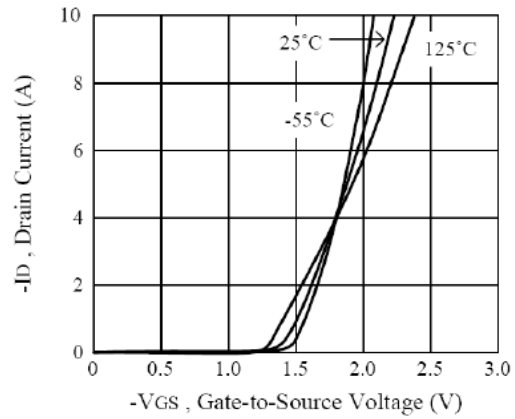


Figure 2. Transfer Characteristics

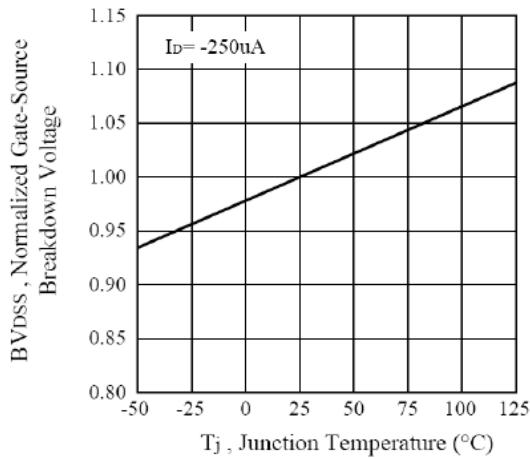


Figure 6. Breakdown Voltage Variation with Temperature

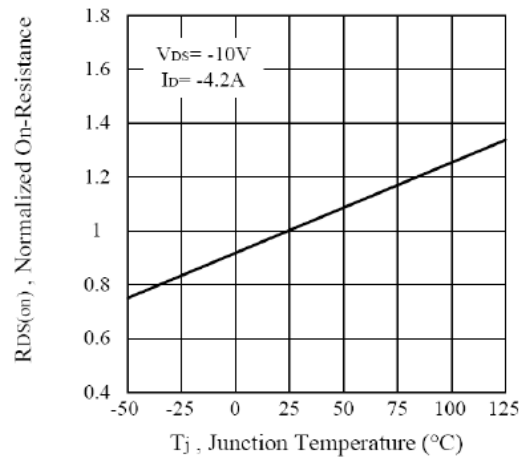


Figure 4. On-Resistance Variation with Temperature

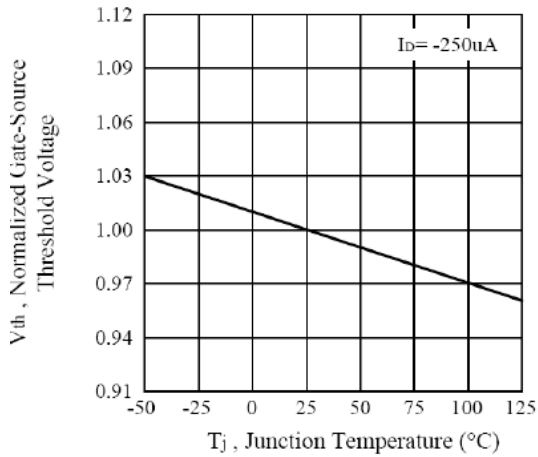


Figure 5. Gate Threshold Variation with Temperature

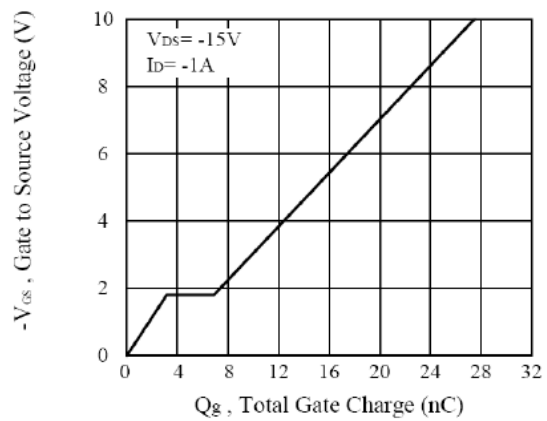


Figure 7. Gate Charge

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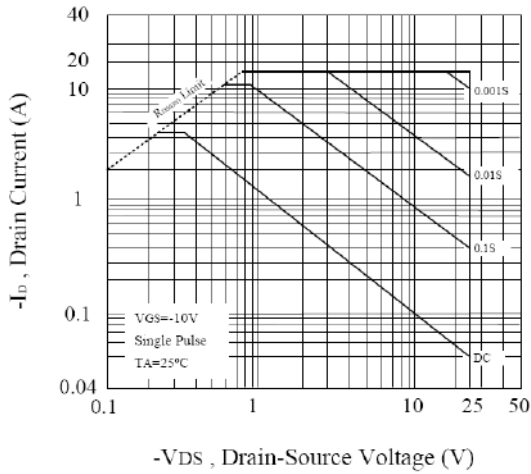


Figure 9. Maximum Safe Operating Area

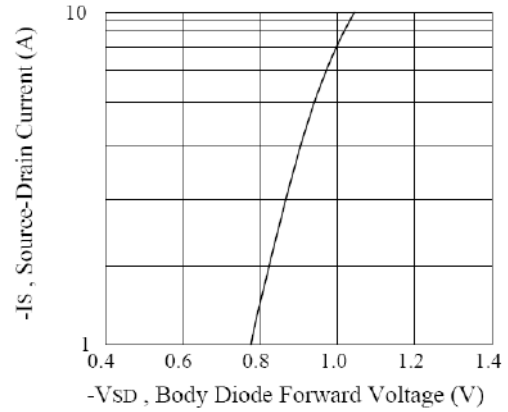


Figure 8. Body Diode Forward Voltage Variation with Source Current

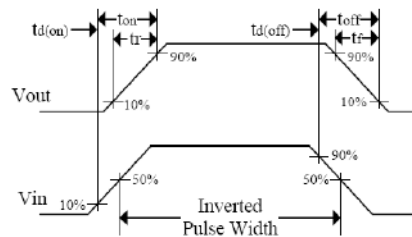
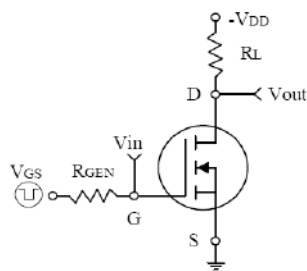


Figure 10. Switching Test Circuit and Switching Waveforms

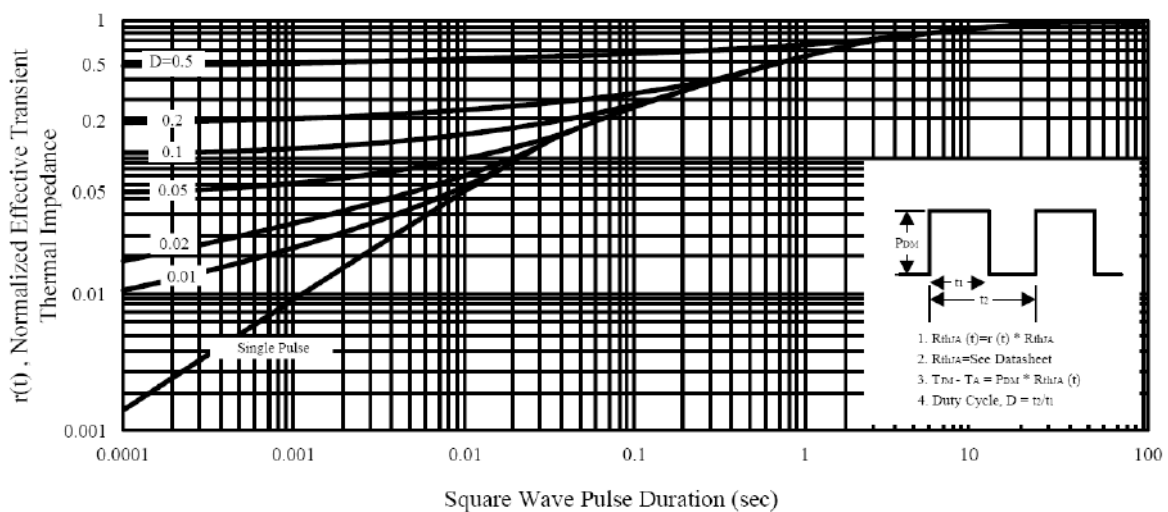


Figure 11. Normalized Thermal Transient Impedance Curve

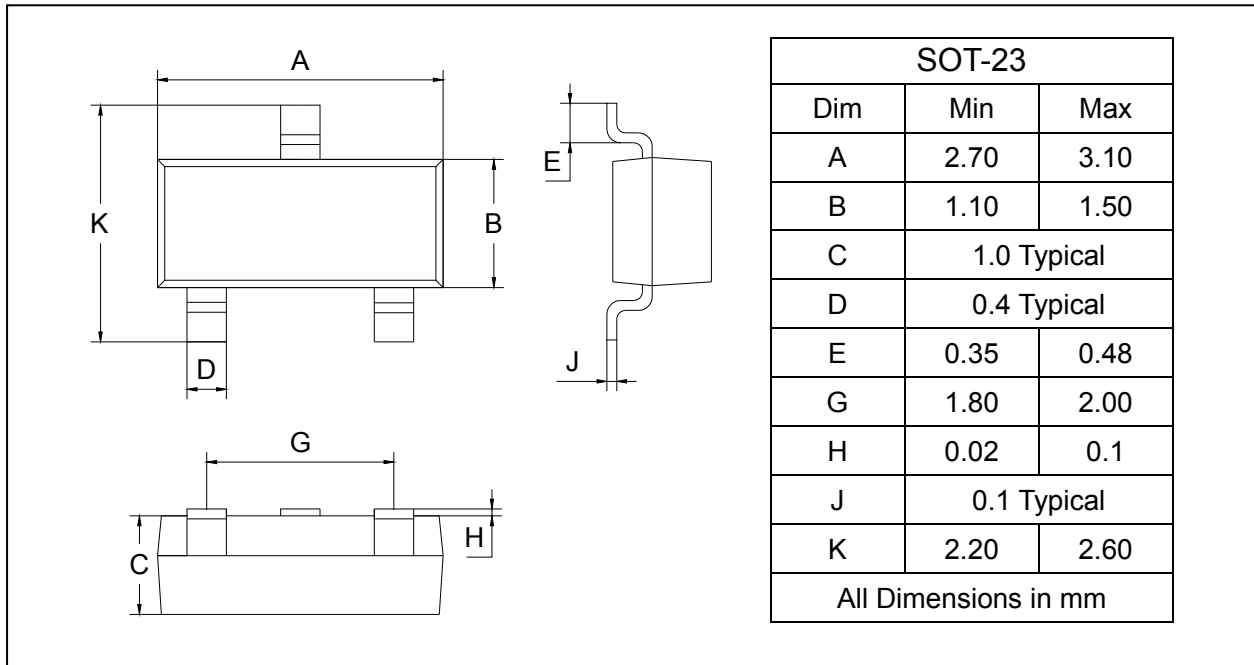
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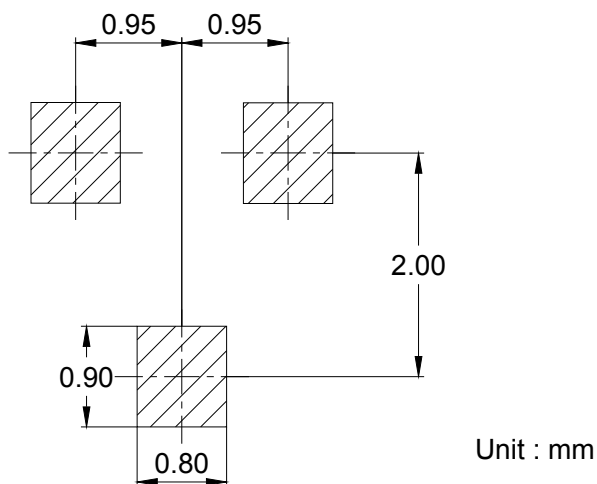
PACKAGE OUTLINE

Plastic surface mounted package

SOT-23



SOLDERING FOOTPRINT



PACKAGE INFORMATION

Device	Package	Shipping
BL3401	SOT-23	3000/Tape&Reel