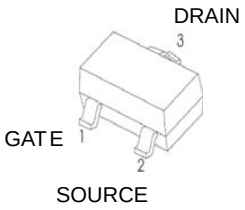
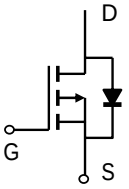
LX3401M
Plastic-Encapsulate MOSFETS

Features

- V_{DS} (V) = -30V
- I_D = -4.2 A (V_{GS} = -10V)
- $R_{DS(ON)}$ < 50mΩ (V_{GS} = -10V)
- $R_{DS(ON)}$ < 65mΩ (V_{GS} = -4.5V)
- $R_{DS(ON)}$ < 120mΩ (V_{GS} = -2.5V)





SOT-23

MARKING

MARKING: A19T

Absolute Maximum Ratings T_A=25°C unless otherwise noted

Parameter		Symbol	Maximum	Units
Drain-Source Voltage		V_{DS}	-30	V
Gate-Source Voltage		V_{GS}	±12	V
Continuous Drain Current[A]	T_A=25℃	I_D	-4.2	A
	T_A=70℃		-3.5	
Pulsed Drain Current[B]		I_{DM}	-30	
Power Dissipation[A]	T_A=25℃	P_D	1.4	W
	T_A=70℃		1	
Junction and Storage Temperature Range		T_J,T_{STG}	-55 to 150	℃

Thermal Characteristics

Parameter		Symbol	TYP	Max	Units
Maximum Junction-to-Ambient[A]	t ≤ 10s	$R_{\theta JA}$	65	90	℃/W
Maximum Junction-to-Ambient[A]	Steady-State		85	125	℃/W
Maximum Junction-to-Lead[C]	Steady-State	$R_{\theta JL}$	43	60	℃/W

Electrical Characteristics (T_J=25°C unless otherwise noted)

Symbol	Parameter	Conditions		Min	Typ	Max	Units
STATIC PARAMETERS							
BV_{DSS}	Drain-Source Breakdown Voltage	I_D=-250μA, V_{GS}=0V		-30			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=-24V, V_{GS}=0V				-1	μA
			T_J=55°C			-5	
I_{GSS}	Gate-Body leakage current	V_{DS}=0V, V_{GS}=±12V				±100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS} I_D=-250μA		-0.7	-1	-1.3	V
$I_{D(ON)}$	On state drain current	V_{GS}=-4.5V, V_{DS}=-5V		-25			A
$R_{DS(ON)}$	Static Drain-Source On-Resistance	V_{GS}=-10V, I_D=-4.2A			42	50	mΩ
			T_J=125°C			75	
		V_{GS}=-4.5V, I_D=-4A			53	65	mΩ
		V_{GS}=-2.5V, I_D=-1A			80	120	mΩ
g_{FS}	Forward Transconductance	V_{DS}=-5V, I_D=-5A		7	11		S
V_{SD}	Diode Forward Voltage	I_S=-1A,V_{GS}=0V			-0.75	-1	V
I_S	Maximum Body-Diode Continuous Current					-2.2	A
DYNAMIC PARAMETERS							
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=-15V, f=1MHz			954		pF
C_{oss}	Output Capacitance				115		pF
C_{rss}	Reverse Transfer Capacitance				77		pF
R_g	Gate resistance	V_{GS}=0V, V_{DS}=0V, f=1MHz			6		Ω
SWITCHING PARAMETERS							
Q_g	Total Gate Charge	V_{GS}=-4.5V, V_{DS}=-15V, I_D=-4A			9.4		nC
Q_{gs}	Gate Source Charge				2		nC
Q_{gd}	Gate Drain Charge				3		nC
$t_{D(on)}$	Turn-On DelayTime	V_{GS}=-10V, V_{DS}=-15V, R_L=3.6Ω, R_{GEN}=6Ω			6.3		ns
t_r	Turn-On Rise Time				3.2		ns
$t_{D(off)}$	Turn-Off DelayTime				38.2		ns
t_f	Turn-Off Fall Time				12		ns
t_{rr}	Body Diode Reverse Recovery Time	I_F=-4A, dI/dt=100A/μs			20.2		ns
Q_{rr}	Body Diode Reverse Recovery Charge	I_F=-4A, dI/dt=100A/μs			11.2		nC

A: The value of $R_{\theta JA}$ is measured with the device mounted on 1in² FR-4 board with 2oz. Copper, in a still air environment with T_A =25°C. The value in any given application depends on the user's specific board design. The current rating is based on the t ≤ 10s thermal resistance rating.
B: Repetitive rating, pulse width limited by junction temperature.
C. The R θJA is the sum of the thermal impedence from junction to lead RθJL and lead to ambient.
D. The static characteristics in Figures 1 to 6,12,14 are obtained using 80 μs pulses, duty cycle 0.5% max.
E. These tests are performed with the device mounted on 1 in² FR-4 board with 2oz. Copper, in a still air environment with T_A=25°C. The SOA curve provides a single pulse rating.

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

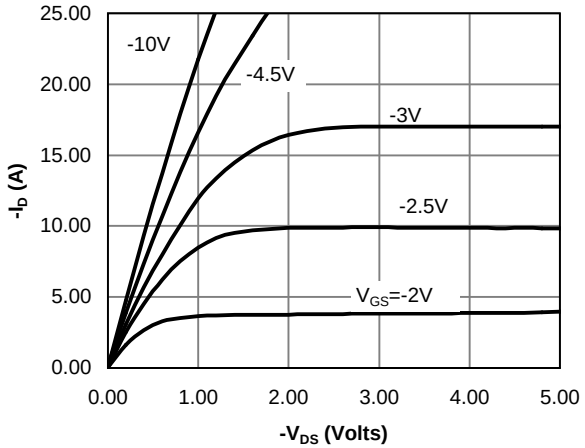


Fig 1: On-Region Characteristics

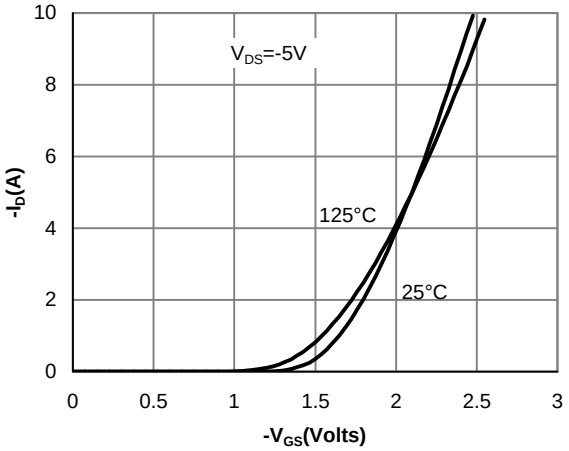


Figure 2: Transfer Characteristics

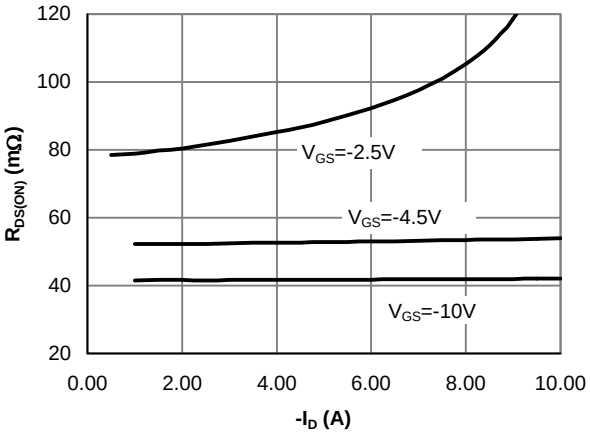


Figure 3: On-Resistance vs. Drain Current and Gate Voltage

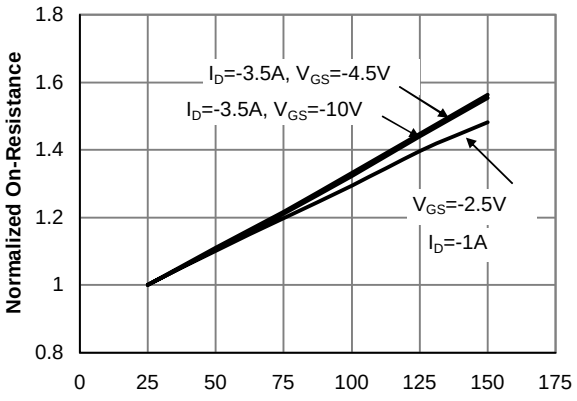


Figure 4: On-Resistance vs. Junction Temperature

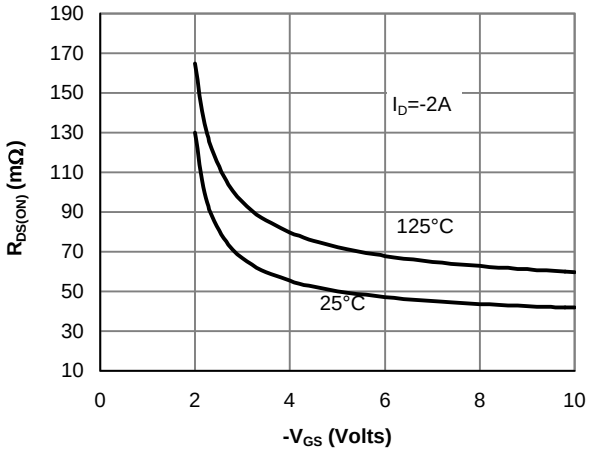


Figure 5: On-Resistance vs. Gate-Source Voltage

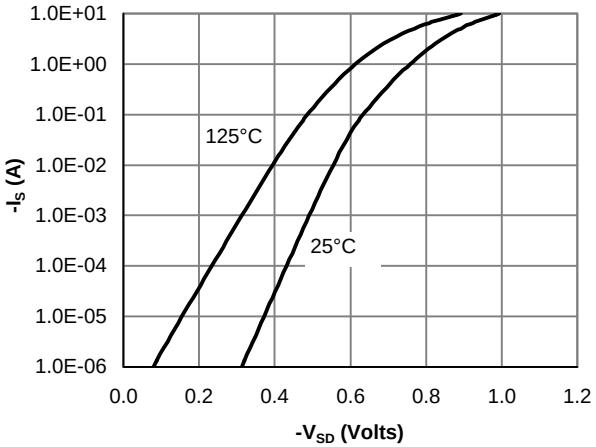


Figure 6: Body-Diode Characteristics

TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

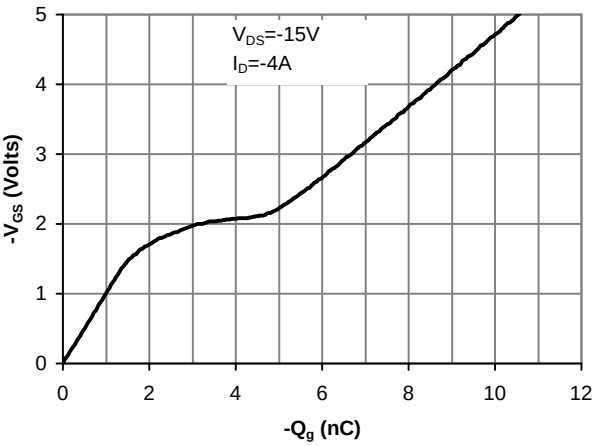


Figure 7: Gate-Charge Characteristics

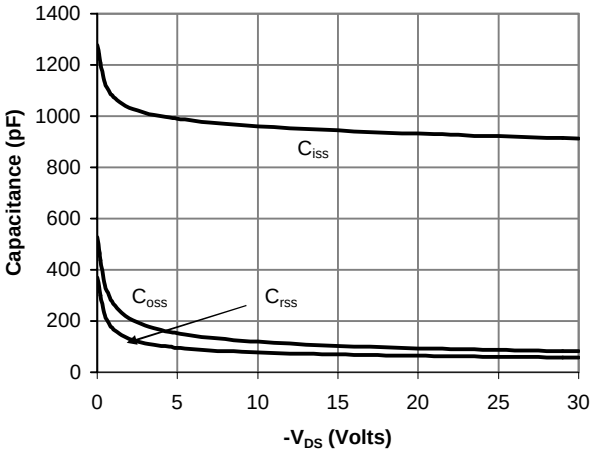


Figure 8: Capacitance Characteristics

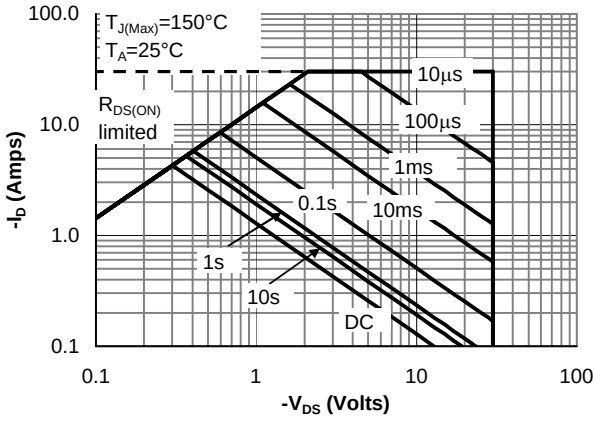


Figure 9: Maximum Forward Biased Safe Operating Area (Note E)

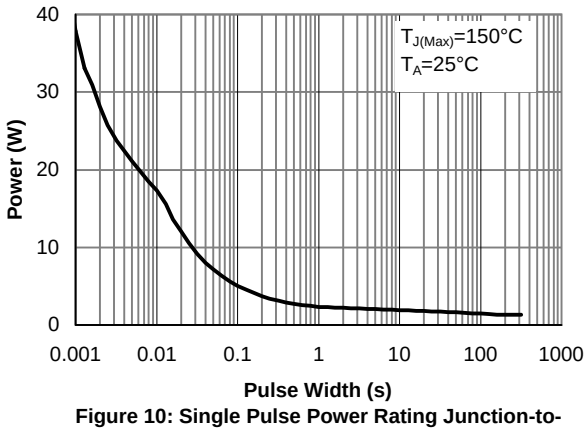


Figure 10: Single Pulse Power Rating Junction-to-Ambient (Note E)

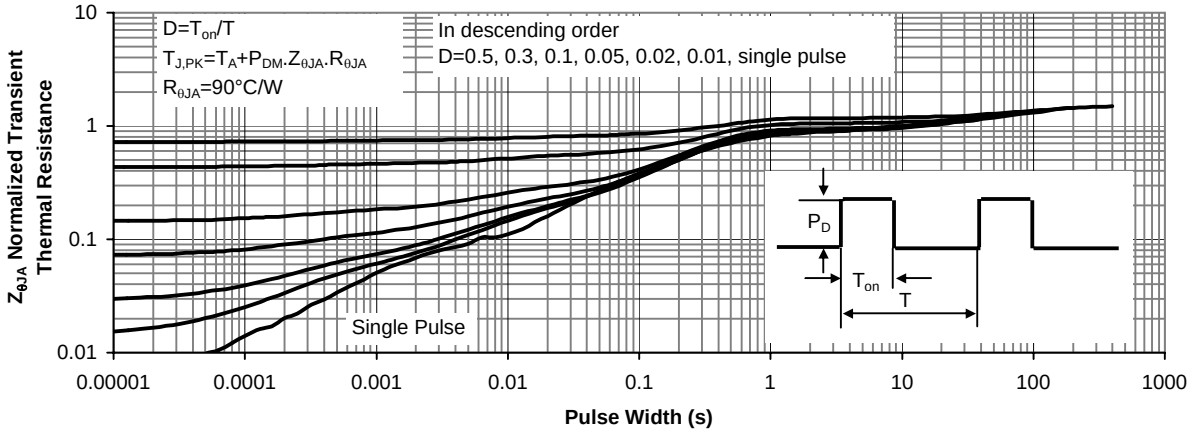
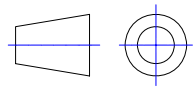
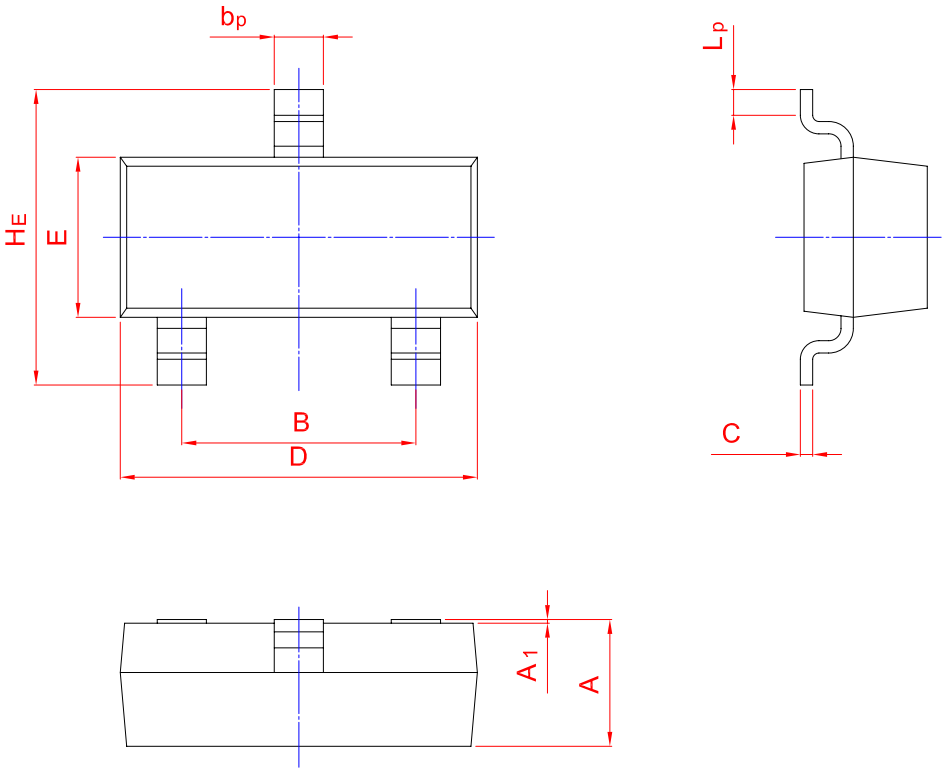


Figure 11: Normalized Maximum Transient Thermal Impedance

PACKAGE OUTLINE

Plastic surface mounted package; 3 leads **SOT-23**





UNIT	A	B	b_p	C	D	E	HE	A1	L_p
mm	1.40 0.95	2.04 1.78	0.50 0.35	0.19 0.08	3.10 2.70	1.65 1.20	3.00 2.20	0.100 0.013	0.50 0.20