

■ PRODUCT CHARACTERISTICS

VDSS	-20V
$R_{DS(on)max}(V_{GS} @=-4.5 V)$	130mΩ
$R_{DS(on)max}(V_{GS} @=-2.5 V)$	250mΩ
ID	-3A

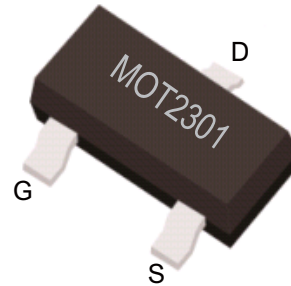
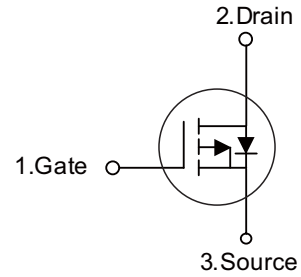
■ APPLICATIONS

- Load switch for portable
- DC/DC converter

■ FEATURES

- * High Density Cell Design For Ultra Low On-Resistance
- * Advanced trench process technology

Symbol



■ ORDER INFORMATION

Order codes		Package	Packing
Halogen-Free	Halogen		
N/A	MOT2301	SOT-23	3000pieces/Real

■ MAXIMUM RATINGS AND THERMAL CHARACTERISTICS (T_c = 25°C unless otherwise noted)

Parameter	Symbol	Limit	Unit	
Drain-Source Voltage	V _{DS}	-20	V	
Gate-Source Voltage	V _{GS}	±10		
Continuous Drain Current	I _D	-3	A	
Pulsed Drain Current ¹⁾	I _{DM}	-10		
Maximum Power Dissipation ²⁾	P _D	TA = 25°	1.25	W
		TA = 75°C	0.8	
Operating Junction and Storage Temperature Range	T _J , T _{stg}	-55 to 150	°C	
Junction-to-Ambient Thermal Resistance (PCB mounted) ²⁾	R _{thJA}	100	°C/W	
Junction-to-Ambient Thermal Resistance (PCB mounted) ³⁾		166		



■ ELECTRICAL CHARACTERISTICS($T_C=25^\circ\text{C}$, unless otherwise specified)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0V, I_D = -250\mu A$	-20			V
Drain-Source On-State Resistance ¹⁾	$R_{DS(on)}$	$V_{GS} = -4.5V, I_D = -3.0A$		120	120	$m\Omega$
		$V_{GS} = -2.5V, I_D = -2.0A$		170	230	
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\mu A$	0.4		1	V
Zero Gate Voltage Drain Current 0	I_{DSS}	$V_{DS} = -20V, V_{GS} = 0V$			-1	μA
		$V_{DS} = -16V, V_{GS} = 0V, T_J=55^\circ C$			-10	
Gate Body Leakage	I_{GSS}	$V_{GS} = \pm 10V, V_{DS} = 0V$			± 100	nA
Forward Transconductance ¹⁾	g_{fs}	$V_{DS} = -5V, I_D = -2.8A$		6.5	—	S
Dynamic						
Total Gate Charge	Q_g	$V_{DS} = -6V, I_D \cong -2.3A$ $V_{GS} = -4.5V$		5.8	10	nC
Gate-Source Charge	Q_{gs}			0.85		
Gate-Drain Charge	Q_{gd}			1.7		
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = -6V, R_L=6\Omega$ $I_D \cong -1.A, V_{GEN} = -4.5V$ $R_G = 6\Omega$		13	25	ns
Turn-On Rise Time	t_r			36	60	
Turn-Off Delay Time	$t_{d(off)}$			42	70	
Turn-Off Fall Time	t_f			34	60	
Input Capacitance	C_{iss}	$V_{DS} = -6V, V_{GS} = 0V$ $f = 1.0\text{ MHz}$		415		μF
Output Capacitance	C_{oss}			223		
Reverse Transfer Capacitance	C_{rss}			87		
Source-Drain Diode						
Max. Diode Forward Current	I_S				-1.6	A
Diode Forward Voltage	V_{SD}	$I_S = -1.0A, V_{GS} = 0V$		-0.8	-1.2	V

¹⁾ Pulse test: pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$

■ TYPICAL CHARACTERISTICS

Figure 1: Switching Test Circuit

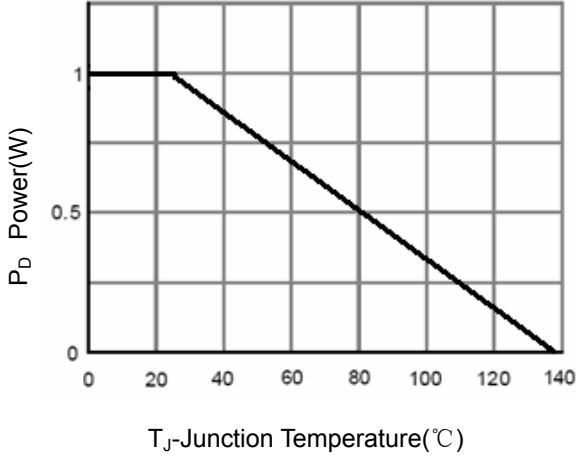


Figure 3 Power Dissipation

Figure 2: Switching Waveforms

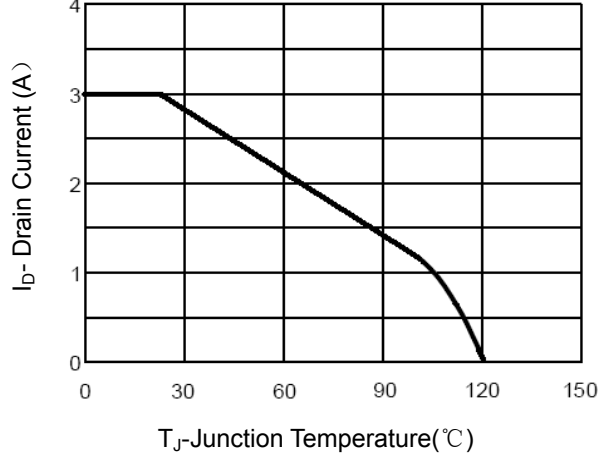


Figure 4 Drain Current

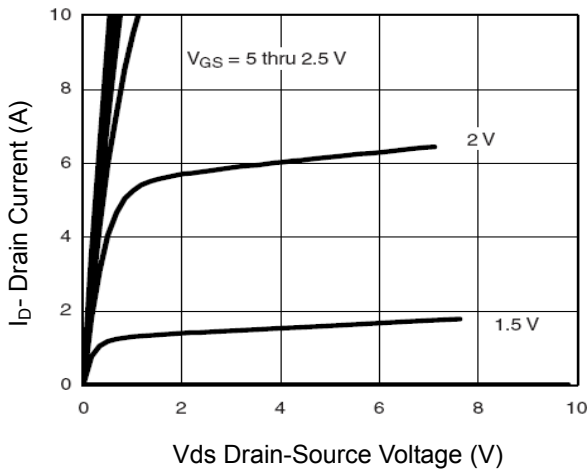


Figure 5 Output CHARACTERISTICS

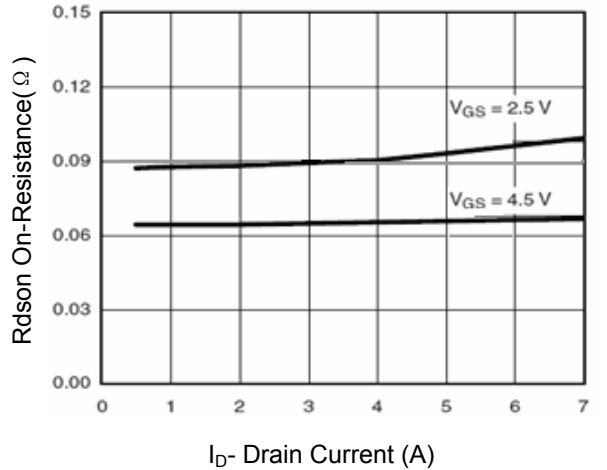


Figure 6 Drain-Source On-Resistance

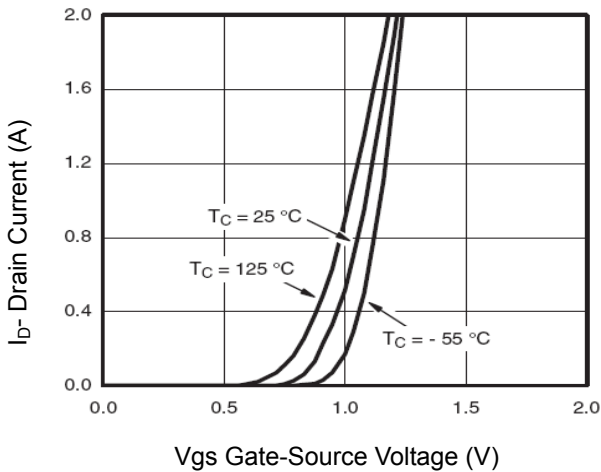


Figure 7 Transfer Characteristics

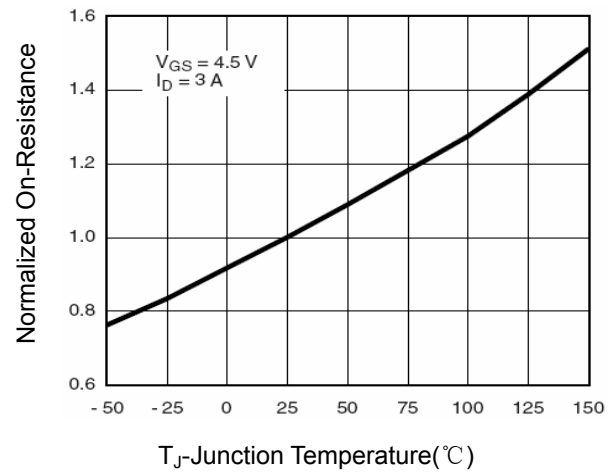


Figure 8 Drain-Source On-Resistance

■ TYPICAL CHARACTERISTICS

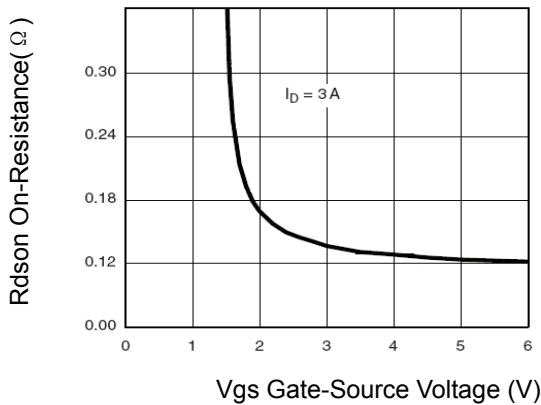


Figure 9 Rds vs Vgs

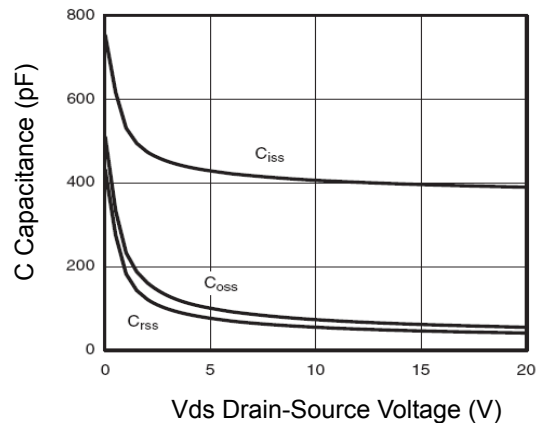


Figure 10 Capacitance vs Vds

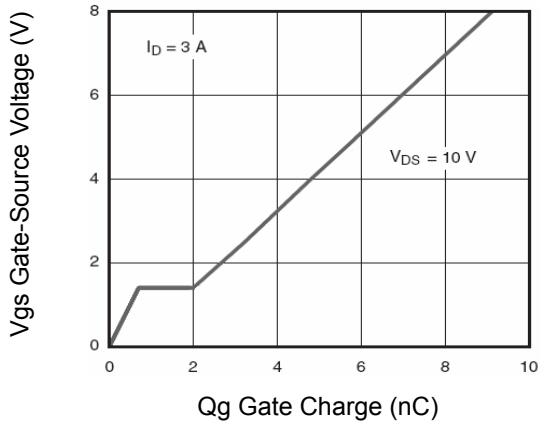


Figure 11 Gate Charge

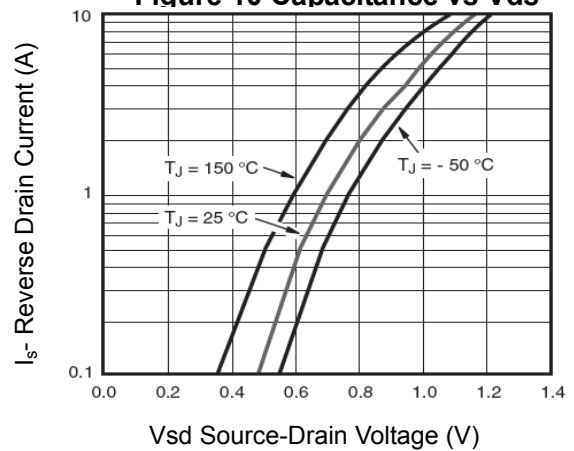


Figure 12 Source- Drain Diode Forward

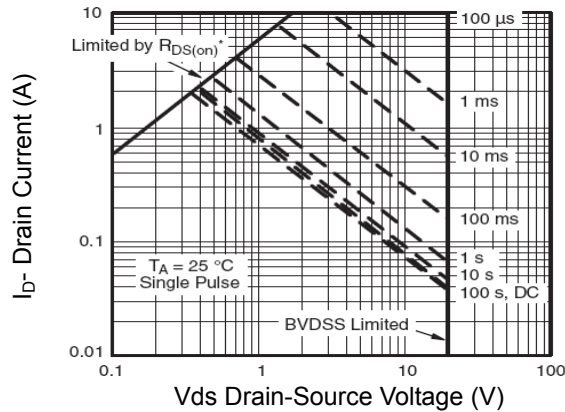


Figure 13 Safe Operation Area

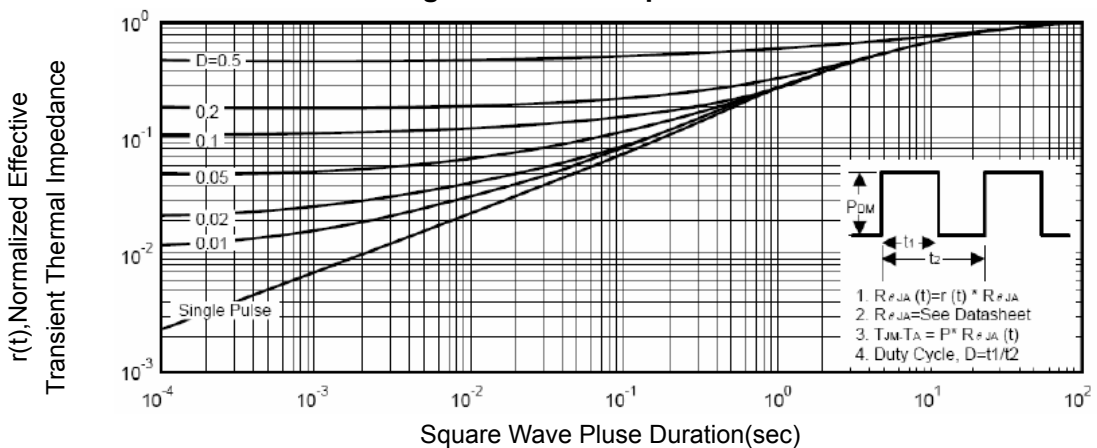


Figure 14 Normalized Maximum Transient Thermal Impedance

■ SOT-23 PACKAGE OUTLINE DIMENSIONS

