P- Channel Enhancement Mode MOSFET

◆ DESCRIPTION

The MT2301 is the P-Channel logic enhancement mode power field effect transistor are produced using high cell density, DMOS trench technology.

This high density process is especially tailored to minimize on-state resistance.

These devices are particularly suited for low voltage application such as cellular phone and notebook computer power management and other Battery powered circuits, and low in-line power loss are needed in a very small outline surface mount package.

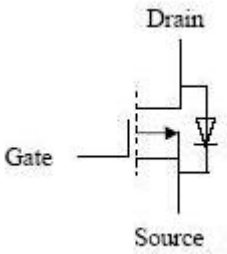
◆ FEATURES

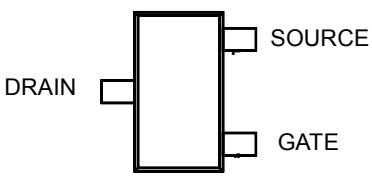
- -20V/-2.8A, $R_{DS(ON)}$ = 120mΩ @ V_{GS} = -4.5V
- -20V/-2.5A, $R_{DS(ON)}$ = 170mΩ @ V_{GS} = -2.5V
- Super high density cell design for extremely low $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability
- SOT-23-3L package design

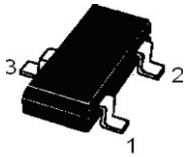
◆ APPLICATIONS

- POWER Management in Note
- Portable Equipment
- Battery Powered System
- DC/DC Converter
- Load Switch
- DSC

◆ PIN CONFIGURATION







P- Channel Enhancement Mode MOSFET

◆ ABSOLUTE MAXIMUM RATINGS

(T_A=25℃ Unless Otherwise Noted)

Parameter		Symbol	Maximum	Unit
Drain-Source Voltage		V_{DS}	-20	V
Gate-Source Voltage		V_{GS}	±12	V
Continuous Drain Current	T_A = 25℃	I_D	-2.8	A
	T_A = 70℃		-1.5	
Pulsed Drain Current		I_{DM}	-10	A
Continuous Source Current (Diode Conduction)		I_S	-1.6	A
Power Dissipation	T_A = 25℃	P_D	1.25	W
	T_A = 70℃		0.8	
Operating junction temperature range		T_J	150	°C
Storage temperature range		T_{STG}	- 55 to 150	°C

◆ THERMAL RESISTANCE RATINGS

Thermal Resistance	Symbol	Maximum	Unit
Junction-to-Ambient	$R_{\theta JA}$	100	°C/W

◆ ORDERING INFORMATION

Device	Package	Shipping
MT2301	SOT-23	3000 PCS / Tape & Reel

◆ ELECTRICAL CHARACTERISTICS

(T_A=25℃ Unless Otherwise Noted)

Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static Parameters						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = -250μA	-20	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	V_{GS} = V_{DS}, I_D = -250μA	-0.45	-	-1.5	V
Gate Current	I_{GSS}	V_{DS} = 0V, V_{GS} = ± 8 V	-	-	±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = -20V, V_{GS} = 0 V	-	-	-1	μA
		V_{DS} =-20V, V_{GS} = 0V, T_J = 55°C	-	-	-10	
Forward Trans conductance	g_{fs}	V_{DS} = -5V, ID = -2.8A	-	6.5	-	s
On-State Drain Current	$I_{D(ON)}$	V_{DS} ≦-5V, V_{GS} = -4.5V	-6	-	-	A
		V_{DS} ≦-5V, V_{GS} = -2.5V	-3	-	-	
Drain-Source On Resistance	$R_{DS(ON)}$	V_{GS} = -4.5V, I_D = -2.8A	-	90	120	mΩ
		V_{GS} = -2.5V, I_D = -2.0A	-	145	170	
Diode Forward Voltage	V_{SD}	I_S =-1.6A, V_{GS} = 0V	-	-0.8	-1.2	V
Dynamic Parameters						
Input Cap.	C_{iss}	V_{DS} = -6V, V_{GS} = 0V, F = 1MHz	-	415	-	pF
Output Cap.	C_{oss}		-	223	-	
Reverse Transfer Cap.	C_{rss}		-	23	-	
Total Gate Charge	Q_g	V_{DS} = -6V, V_{GS} =- 4.5V, I_D = -2.8A	-	5.8	10	nC
Gate-Source Charge	Q_{gs}		-	0.85	-	
Gate-Drain Charge	Q_{gd}		-	1.7	-	
Turn-On Time	$T_{D(ON)}$	V_{DS} = -6V, R_L = 6Ω, I_D = -1A, V_{GEN} = -4.5V, R_G = 6Ω	-	13	25	nS
	t_r		-	36	60	
Turn-Off Time	$T_{D(OFF)}$		-	42	70	
	t_f		-	34	60	

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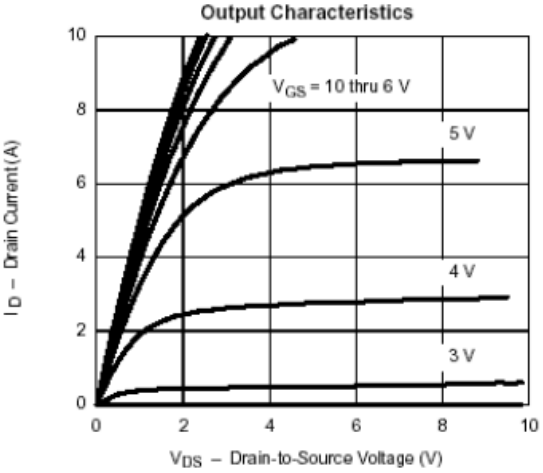
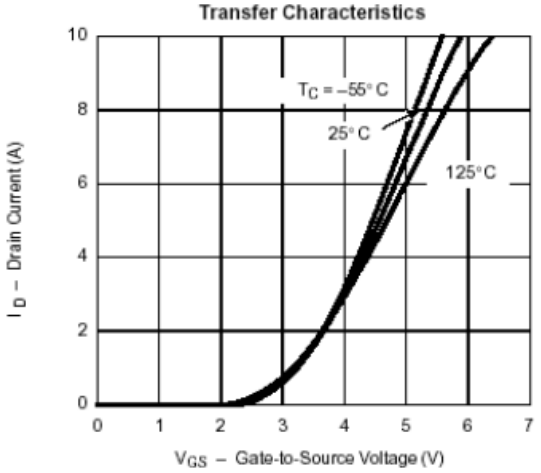
◆ TYPICAL CHARACTERICTICS

(25℃ Unless Noted)

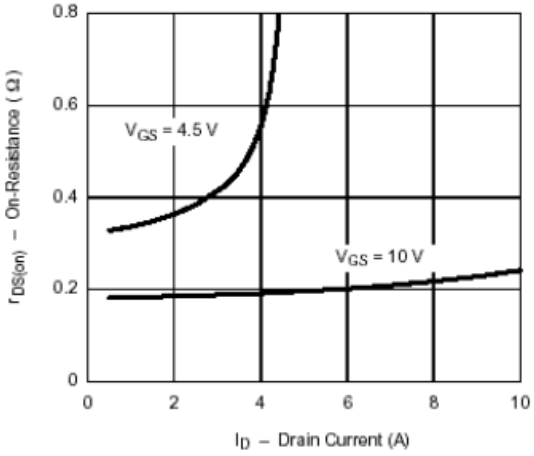
Output Characteristics



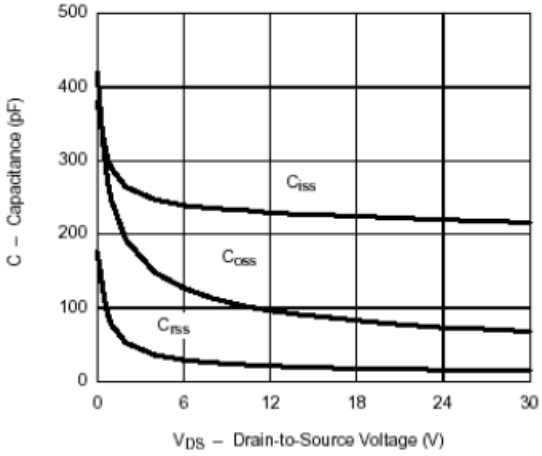
Transfer Characteristics



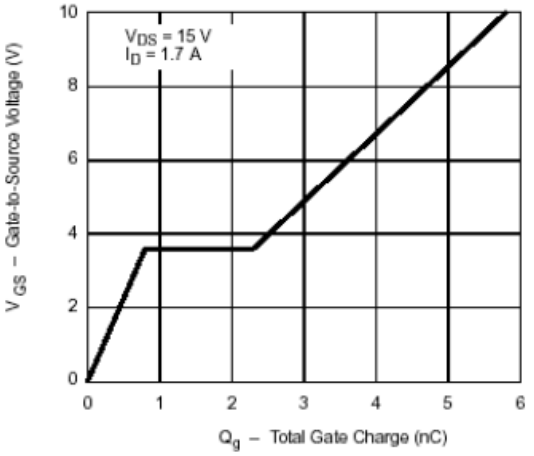
On-Resistance vs. Drain Current



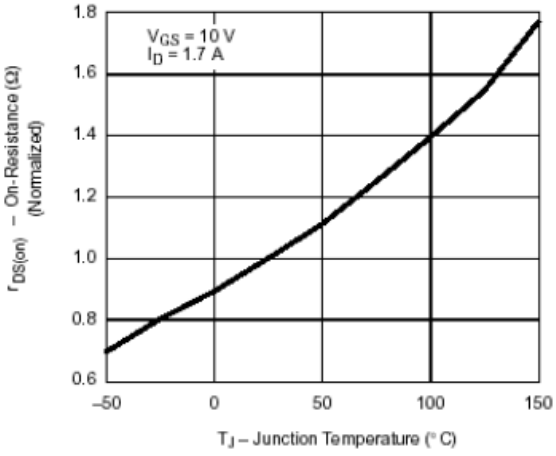
Capacitance



Gate Charge



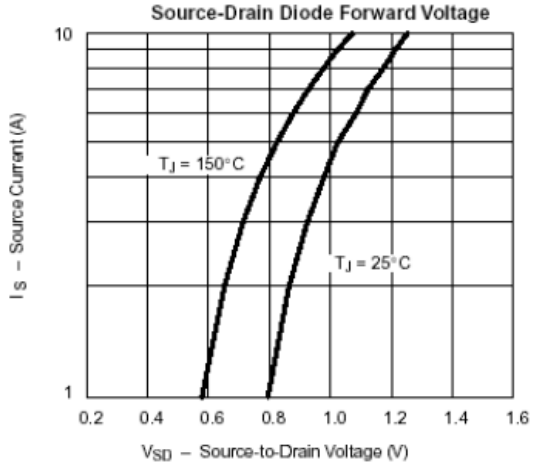
On-Resistance vs. Junction Temperature



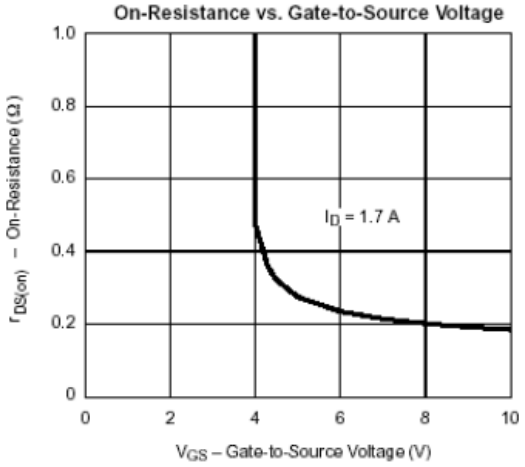
◆ TYPICAL CHARACTERICTICS

(25℃ Unless Noted)

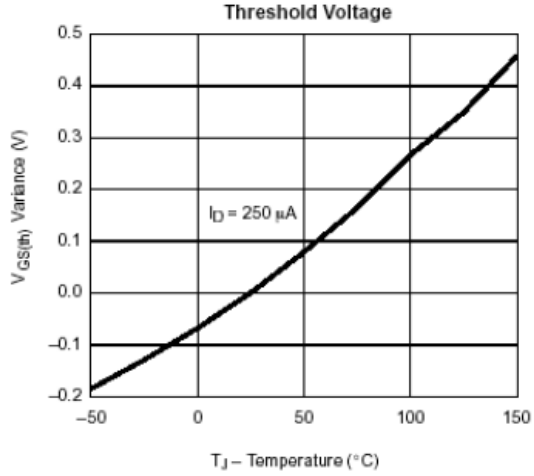
Source-Drain Diode Forward Voltage



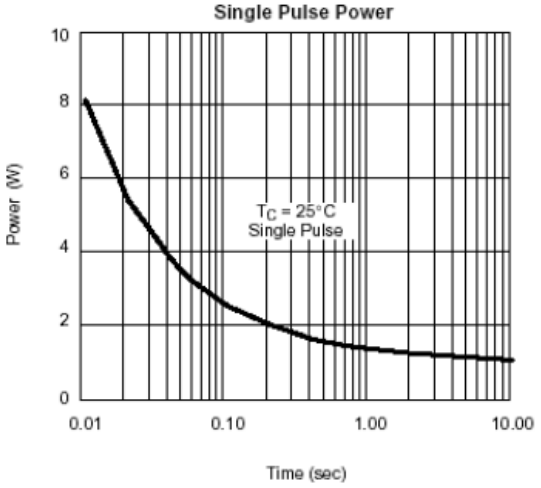
On-Resistance vs. Gate-to-Source Voltage



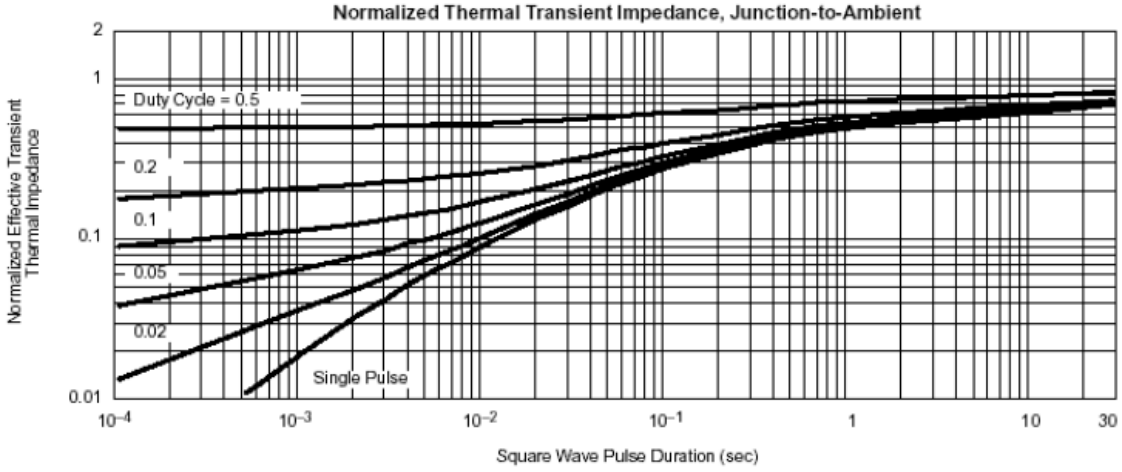
Threshold Voltage



Single Pulse Power

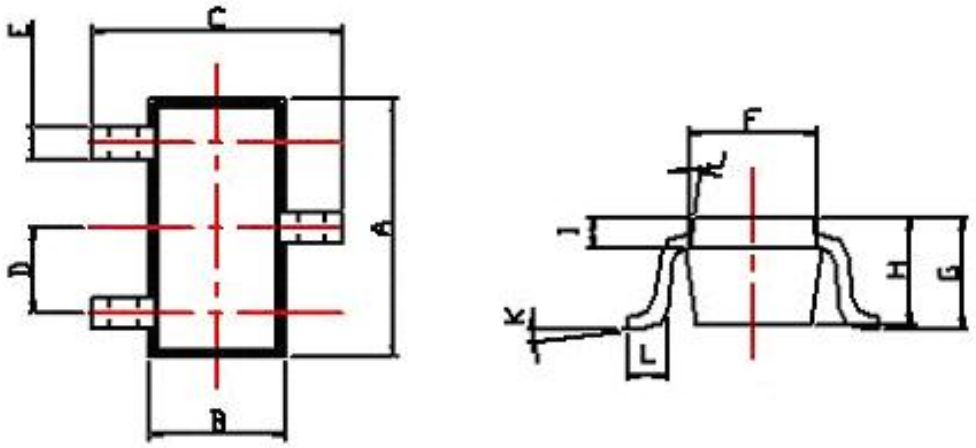


Normalized Thermal Transient Impedance, Junction-to-Ambient



◆ PHYSICAL DIMENSIONS

3-Pin surface Mount SOT-23



REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	2.70	3.10	G	0.9	1.4
B	1.20	1.66	H	0.8	1.30
C	2.37	2.90	I	0.25	0.7
D	0.85	1.15	J	7 ± 2°.	
E	0.350 + 0.15/-0.05		K	0 ~ 10°.	
F	1.07	1.53	L	0.2 (MIN)	