

Surface Mount P-Channel Enhancement Mode MOSFET

(Pb) Lead(Pb)-Free

Features:

*Super high dense cell design for low $R_{DS(ON)}$

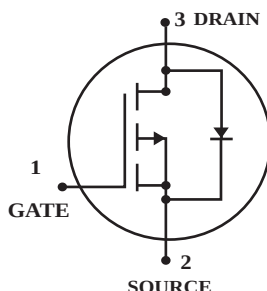
$R_{DS(ON)} < 60 \text{ m}\Omega @ V_{GS} = -4.5\text{V}$

$R_{DS(ON)} < 80 \text{ m}\Omega @ V_{GS} = -2.5\text{V}$

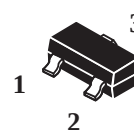
$R_{DS(ON)} < 105 \text{ m}\Omega @ V_{GS} = -1.8\text{V}$

*Rugged and Reliable

*SOT-23 Package



DRAIN CURRENT
- 3.4 AMPERES
DRAIN SOURCE VOLTAGE
- 20 VOLTAGE



SOT-23

Maximum Ratings (TA=25°C Unless Otherwise Specified)

Rating	Symbol	Value	Unite
Drain-Source Voltage	V_{DS}	-20	V
Gate-Source Voltage	V_{GS}	± 12	V
Continuous Drain Current ($T_J = 125^\circ\text{C}$) ⁽¹⁾	I_D	-3.4	A
Pulsed Drain Current ⁽²⁾	I_{DM}	-12	A
Drain-Source Diode Forward Current ⁽¹⁾	I_S	-1.25	A
Power Dissipation ⁽¹⁾	P_D	1.25	W
Maximax Junction-to-Ambient	$R_{\theta JA}$	100	$^\circ\text{C/W}$
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55 to 150	$^\circ\text{C}$

Device Marking

WT2301=S01

Electrical Characteristics ($T_A=25^\circ\text{C}$ Unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
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Static (2)

Drain-Source Breakdown Voltage $V_{GS}=0V, I_D=-250\text{ }\mu\text{A}$	$V_{(BR)DSS}$	-20	-	-	V
Gate-Source Threshold Voltage $V_{DS}=V_{GS}, I_D=-250\text{ }\mu\text{A}$	$V_{GS(th)}$	-0.6	-0.85	-1.5	V
Gate-Source Leakage Current $V_{DS}=0V, V_{GS}=\pm 10V$	I_{GSS}	-	-	± 100	nA
Zero Gate Voltage Drain Current $V_{DS}=-16V, V_{GS}=0V$	I_{DSS}	-	-	1	μA
Drain-Source On-Resistance $V_{GS}=-4.5V, I_D=-4.0A$ $V_{GS}=-2.5V, I_D=-2.0A$ $V_{GS}=-1.8V, I_D=-1.0A$	$r_{DS(on)}$	- - -	50 70 95	60 80 105	$\text{m}\Omega$
On-State Drain Current $V_{DS}=-5V, V_{GS}=-4.5A$	$I_{D(on)}$	-20	-	-	A
Forward Transconductance $V_{DS}=-5V, I_D=-5A$	g_{fs}	5	-	-	S

Dynamic(3)

Input Capacitance $V_{DS}=-15V, V_{GS}=0V, f=1\text{MHz}$	C_{iss}	-	926	-	pF
Output Capacitance $V_{DS}=-15V, V_{GS}=0V, f=1\text{MHz}$	C_{oss}	-	183	-	
Reverse Transfer Capacitance $V_{DS}=-15V, V_{GS}=0V, f=1\text{MHz}$	C_{rss}	-	141	-	

Switching (3)

Turn-On Time $V_{GS}=-4.5V, V_{DD}=-10V, I_D=-1A, R_L=10\text{ }\Omega, R_{GEN}=6\text{ }\Omega$	$t_{d(on)}$	-	13.9	-	nS
Rise Time $V_{GS}=-4.5V, V_{DD}=-10V, I_D=-1A, R_L=10\text{ }\Omega, R_{GEN}=6\text{ }\Omega$	t_r	-	17.6	-	nS
Turn-Off Time $V_{GS}=-4.5V, V_{DD}=-10V, I_D=-1A, R_L=10\text{ }\Omega, R_{GEN}=6\text{ }\Omega$	$t_{d(off)}$	-	87.7	-	nS
Fall Time $V_{GS}=-4.5V, V_{DD}=-10V, I_D=-1A, R_L=10\text{ }\Omega, R_{GEN}=6\text{ }\Omega$	t_f	-	53.9	-	nS
Total Gate Charge $V_{DS}=-10V, I_D=-3A, V_{GS}=-4.5V$	Q_g	-	11.9	-	nc
Gate-Source Charge $V_{DS}=-10V, I_D=-3A, V_{GS}=-4.5V$	Q_{gs}	-	1.96	-	nc
Gate-Drain Charge $V_{DS}=-10V, I_D=-3A, V_{GS}=-4.5V$	Q_{gd}	-	3.49	-	nc
Drain-Source Diode Forward Voltage $V_{GS}=0V, I_S=-1.25A$	V_{SD}	-	-0.795	-1.2	V

Note: 1. Surface Mounted on FR4 Board $t \leq 10\text{sec}$.
 2. Pulse Test : $PW \leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$.
 3. Guaranteed by Design, not Subject to Production Testing.

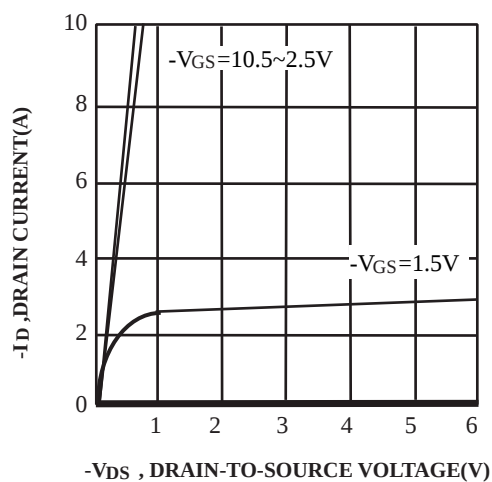


FIG.1. Output Characteristics

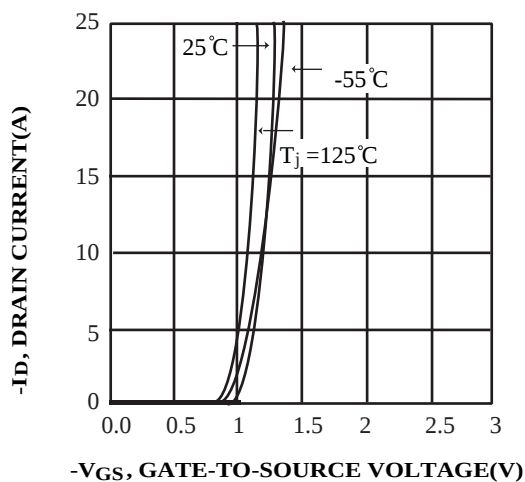


FIG.2 Transfer Characteristics

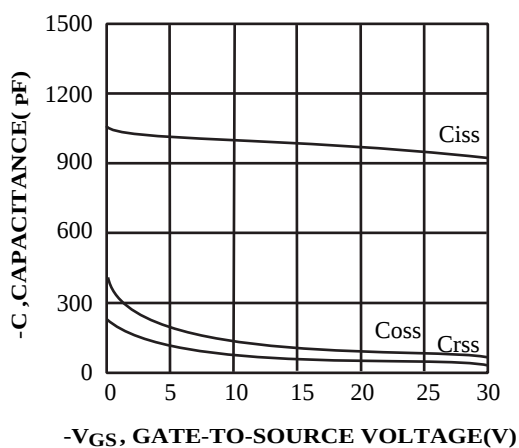


FIG.3 Capacitance

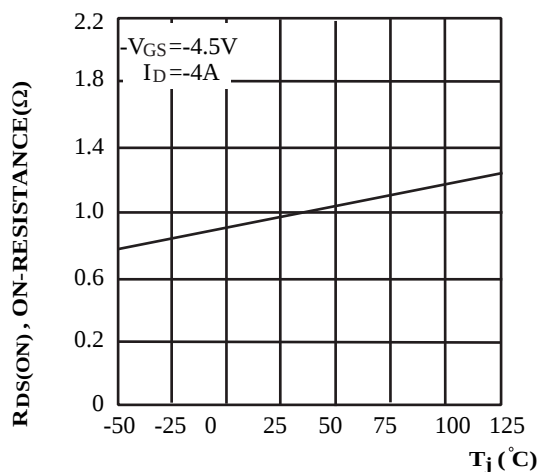


FIG.4 On-Resistance Variation with Temperature

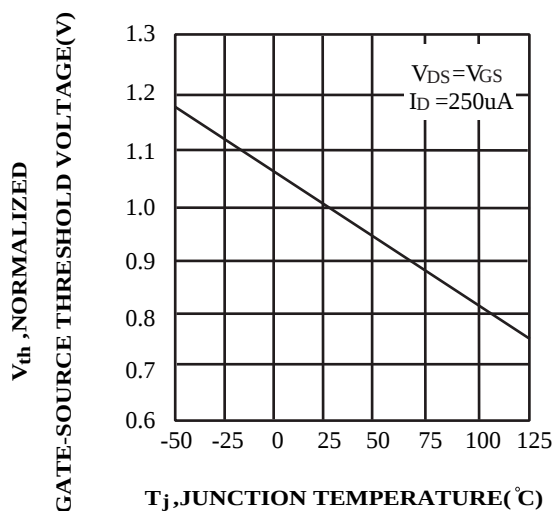


FIG.5 Gate Threshold Variation with Temperature

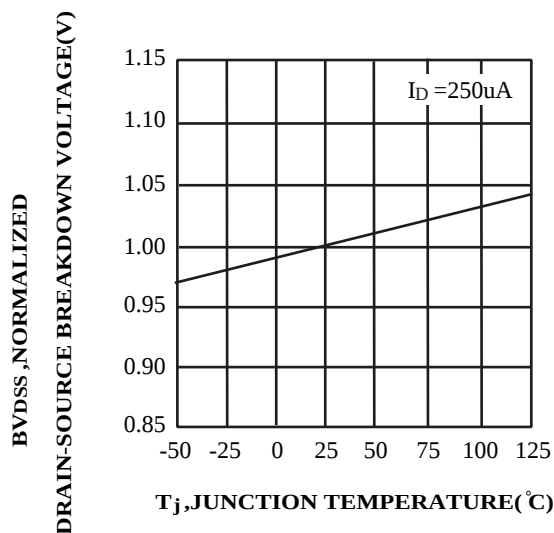
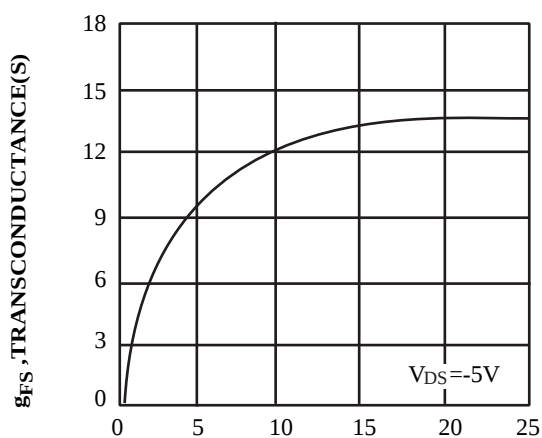
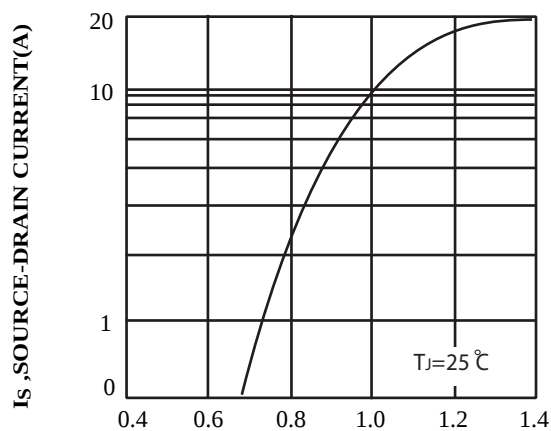


FIG.6 Breakdown Voltage Variation with Temperature



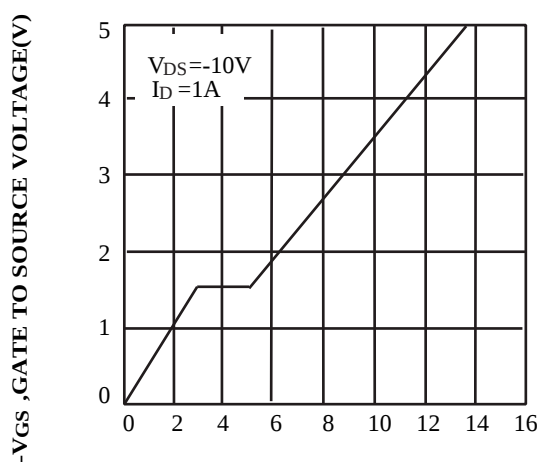
IDS ,DRAIN-SOURCE CURRENT(A)

FIG.7 Transconductance Variation with Drain Current



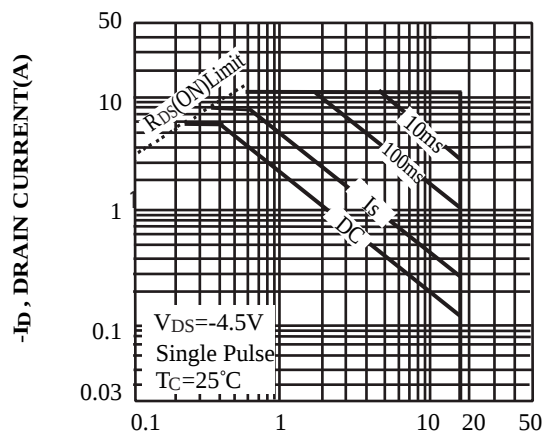
VSD ,BODY DIODE FORWARD VOLTAGE(V)

FIG.8 Body Diode Forward Voltage Variation with Source Current



QG ,TOTAL GATE CHARGE(nC)

FIG.9 Gate Charge



VDS ,DRAIN-SOURCE VOLTAGE(V)

FIG.10 Maximum Safe Operating Area

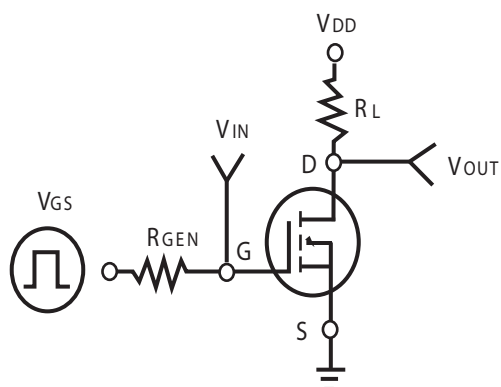


FIG.11 Switching Test Circuit

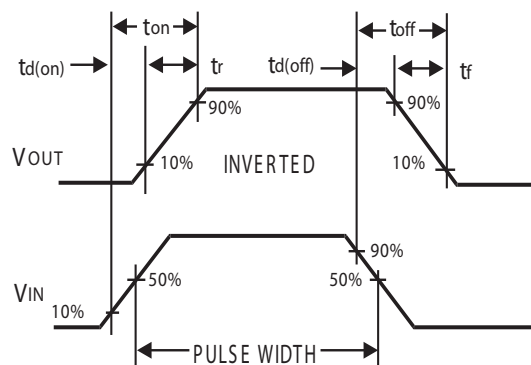


FIG.12 Switching Waveforms

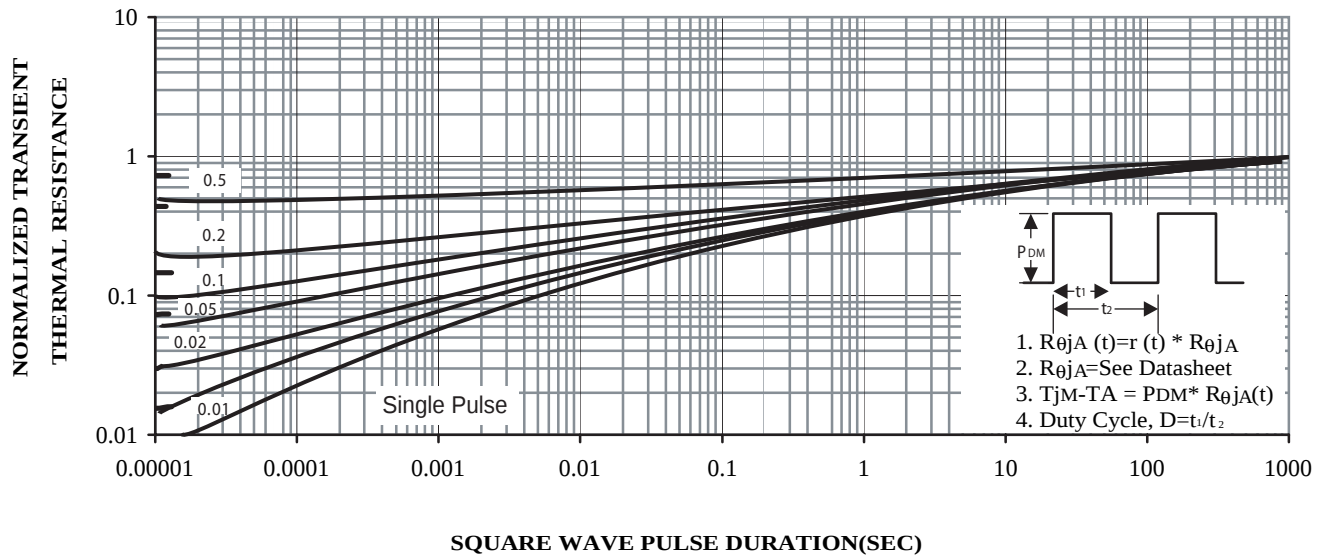
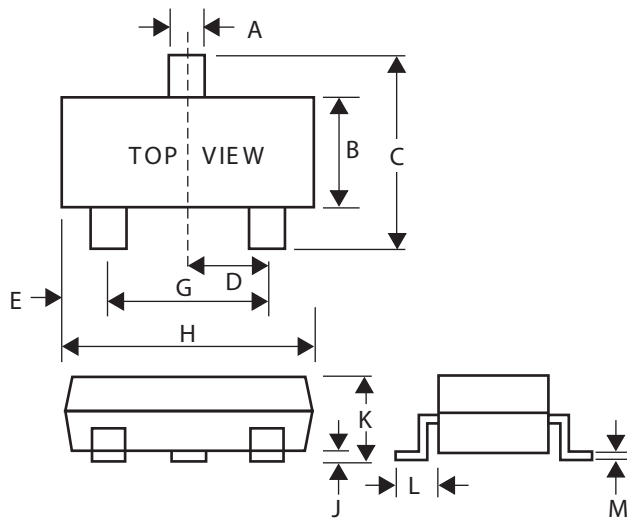


FIG.13 NORMALIZED THERMAL TRANSIENT IMPEDANCE CUREVE

SOT-23 Package Outline Dimensions

Unit:mm



Dim	Min	Max
A	0.35	0.51
B	1.19	1.40
C	2.10	3.00
D	0.85	1.05
E	0.46	1.00
G	1.70	2.10
H	2.70	3.10
J	0.01	0.13
K	0.89	1.10
L	0.30	0.61
M	0.076	0.25