



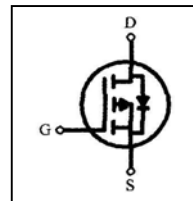
FCI2301 P-Channel High-Density Trench MOSFET

DESCRIPTION

Our FCI2301 P-Channel High-Density Trench MOSFETs utilize advanced processing techniques to achieve extremely low on-resistance per silicon area. This benefit, combined with the fast switching speed and ruggedized device design of our products provides the designer with an extremely efficient and reliable device for use in a variety of applications.

FEATURES

- Super high dense cell trench design for low $R_{DS(on)}$
- P-Channel Trench MOSFET
- SOT-23-3L Footprint
- Available in Tape and Reel
- Rugged and Reliable



$V_{DSS} = -20V$

$R_{DS(on)} = 130m\Omega$ (max.) @ $V_{GS} = -4.5V$ ($I_D = -2.8A$)

$R_{DS(on)} = 190m\Omega$ (max.) @ $V_{GS} = -2.5V$ ($I_D = -2.0A$)

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ C$ unless otherwise specified)

Characteristic	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	-20	V
Continuous Drain Current ¹ @ $T_A = 25^\circ C$	I_D	-2.3	A
Pulsed Drain Current ²	I_{DM}	-10	
Maximum Power Dissipation ¹	P_D	1.25	W
Drain-Source Diode Forward Current ¹	I_S	-1.6	A
Gate-to-Source Voltage	V_{GS}	± 8	V
Junction and Storage Temperature Range	T_J, T_{STG}	-55 to + 150	$^\circ C$

THERMAL RESISTANCE

Characteristic	Symbol	Value	Unit
Junction-to-Ambient Thermal Resistance ¹	$R_{\theta JA}$	85	$^\circ C/W$

Notes:

1. Surface Mounted on FR4 Board, $t \leq 10$ sec.
2. Pulse Test: Pulse width $\leq 300 \mu s$, Duty Cycle $\leq 2\%$.



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

Parameter	Symbol	Condition	Min.	Typ. ³	Max.	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0V, I_D = -250\mu A$	-20			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -16V, V_{GS} = 0V$			-1	μA
Gate-Body Leakage	I_{GSS}	$V_{GS} = -8V, V_{DS} = 0V$			-100	nA
ON CHARACTERISTICS²						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\mu A$	-0.6			V
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS} = -4.5V, I_D = -2.8A$			130	$m\Omega$
		$V_{GS} = -2.5V, I_D = -2.0A$			190	$m\Omega$
DRAIN-SOURCE DIODE CHARACTERISTICS²						
Diode Forward Voltage	V_{SD}	$V_{GS} = 0V, I_S = -1.0A$			-1.0	V
SWITCHING CHARACTERISTICS²						
Total Gate Charge	Q_g	$V_{DS} = -10V, I_D = -1A$ $V_{GS} = -4.5V$		4.32		nC
Gate-Source Charge	Q_{gs}			1.06		nC
Gate-Drain Charge	Q_{gd}			0.84		nC
SWITCHING CHARACTERISTICS³						
Turn-On Delay Time	$t_{D(ON)}$	$V_{DD} = -10V, I_D = -1A$ $V_{GEN} = -4.5V$ $R_L = 10\text{ ohms}$ $R_{GEN} = 10\text{ ohms}$		13		ns
Rise Time	t_r			36		ns
Turn-Off Delay Time	$t_{D(OFF)}$			42		ns
Fall Time	t_f			34		ns

Notes:

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



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RATINGS AND CHARACTERISTIC CURVES

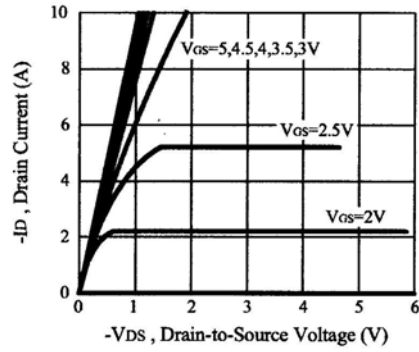


Figure 1. Output Characteristics

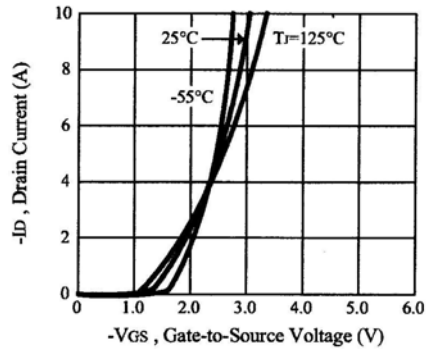


Figure 2. Transfer Characteristics

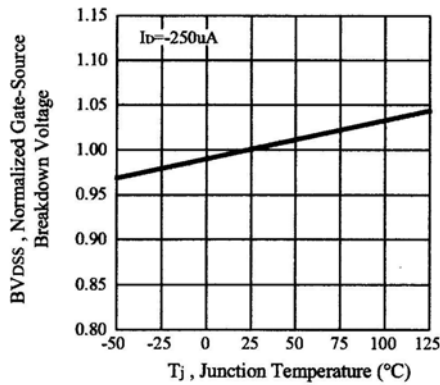


Figure 3. Breakdown Voltage Variation with Temperature

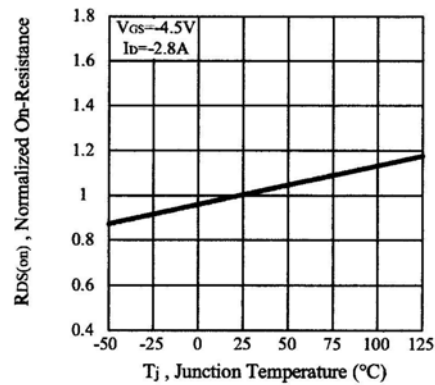


Figure 4. On-Resistance Variation with Temperature

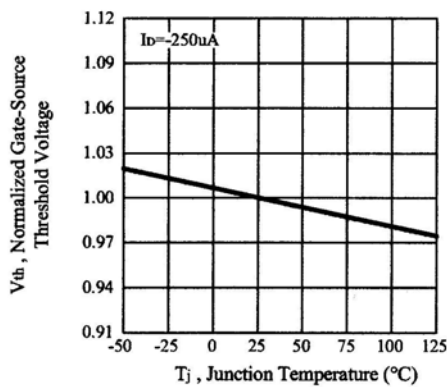


Figure 5. Gate Threshold Variation with Temperature

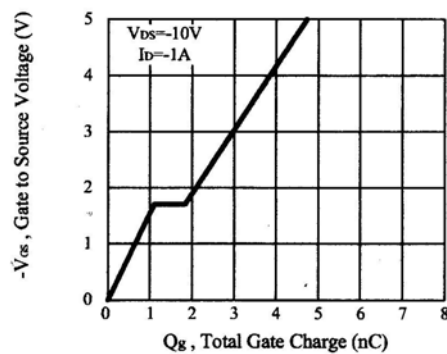


Figure 6. Gate Charge



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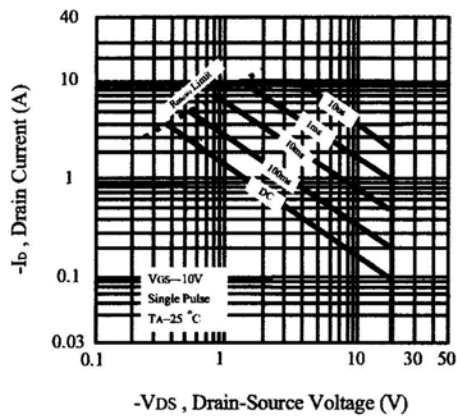


Figure 7. Maximum Safe Operating Area

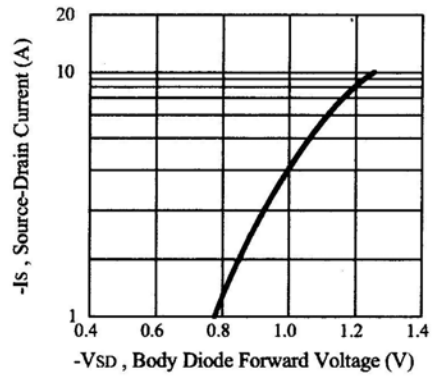


Figure 8. Body Diode Forward Voltage Variation with Source Current

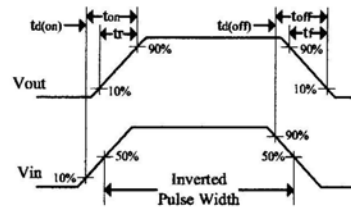
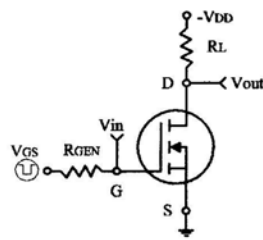


Figure 9. Switching Test Circuit and Switching Waveforms

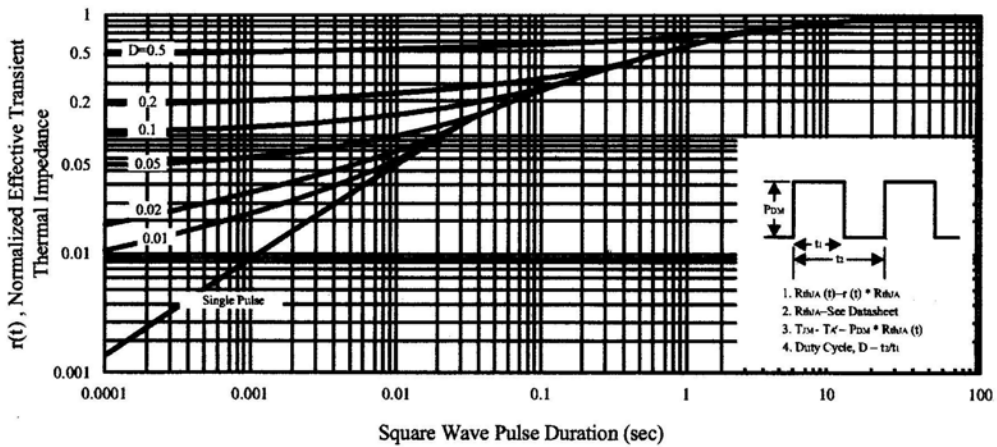
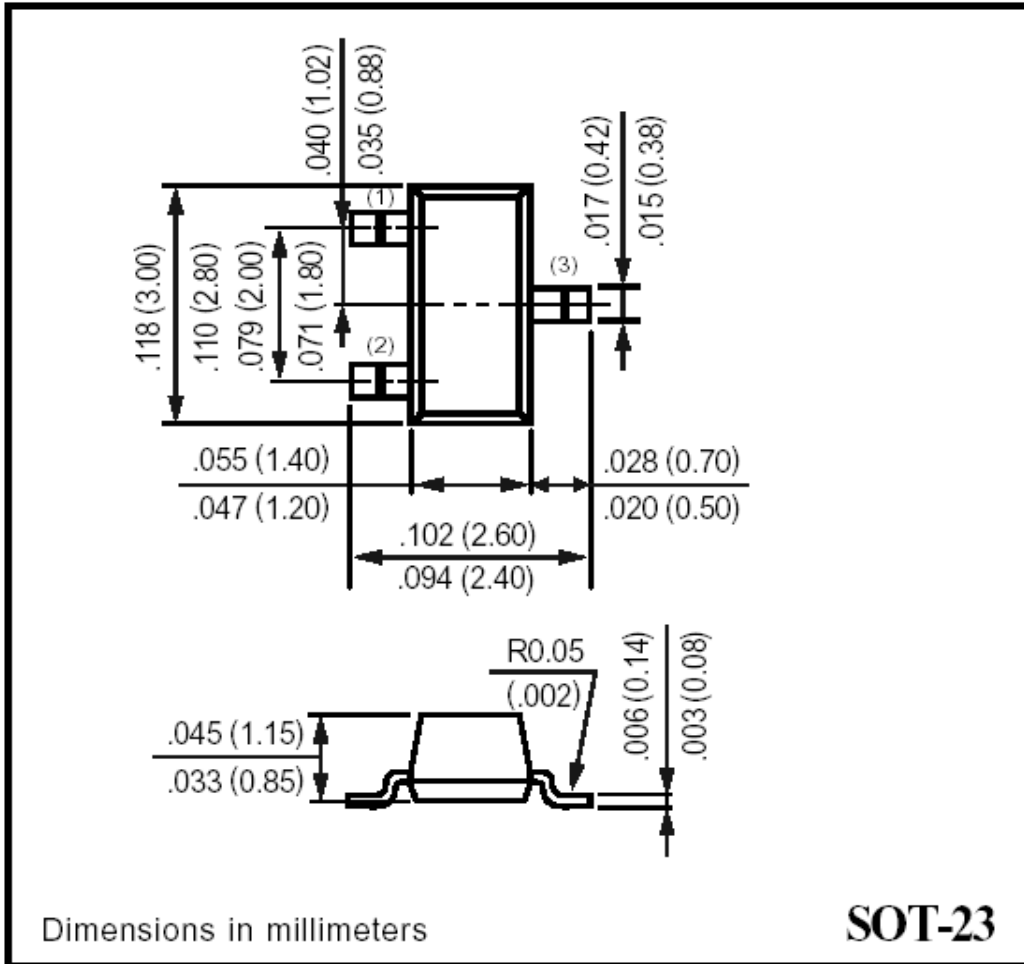


Figure 10. Normalized Thermal Transient Impedance Curve

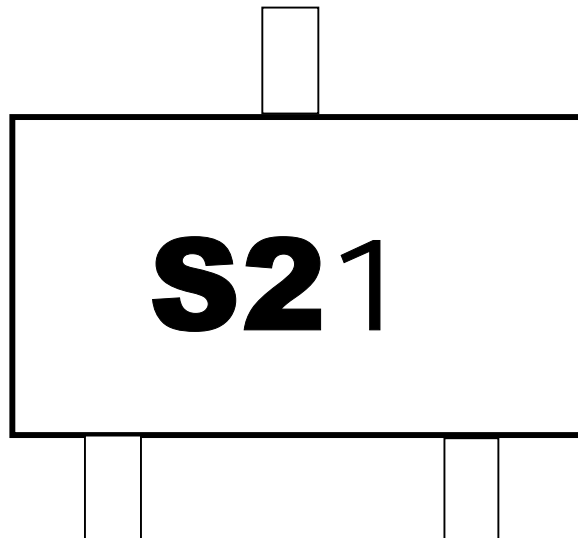


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SOT-23 PACKAGE DIMENSIONS



Marking



Marking Guide: S21 = FCI2301 SOT-23 Package