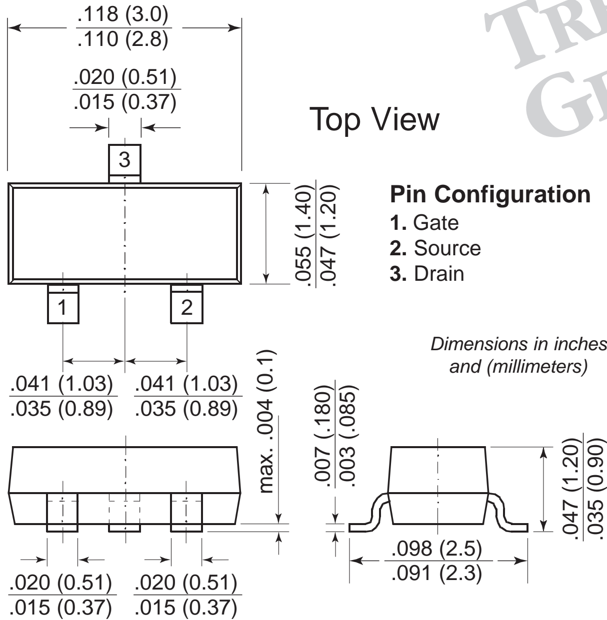
GF2304

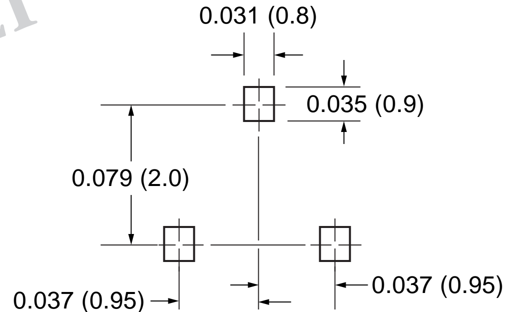
N-Channel Enhancement-Mode MOSFET

V_{DS} 30V **$R_{DS(ON)}$** 0.117Ω **I_D** 2.5A

TO-236AB (SOT-23)



TRENCH GENFET®



Mounting Pad Layout

Mechanical Data

Case: SOT-23 Plastic Package
Weight: approx. 0.008g
Marking Code: 04

Features

- Advanced trench process technology
- High density cell design for ultra-low on-resistance
- Popular SOT-23 package with copper lead-frame for superior thermal and electrical capabilities
- Compact and low profile

Maximum Ratings and Thermal Characteristics (T_A = 25°C unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	30	V
Gate-Source-Voltage	V_{GS}	±20	V
Continuous Drain Current T_J = 150°C T_A = 25°C	I_D	2.5	A
Pulsed Drain Current[(1)]	I_{DM}	10	A
Maximum Power Dissipation[(2)] T_A = 25°C T_A = 70°C	P_D	1.25 0.80	W
Operating Junction and Storage Temperature Range	T_J, T_{stg}	–55 to +150	°C
Maximum Junction-to-Ambient Thermal Resistance[(2)]	$R_{\theta JA}$	100	°C/W

Notes:
(1) Pulse width limited by maximum junction temperature.
(2) Surface mounted on FR4 board, (1" x 1", 2oz. Cu)

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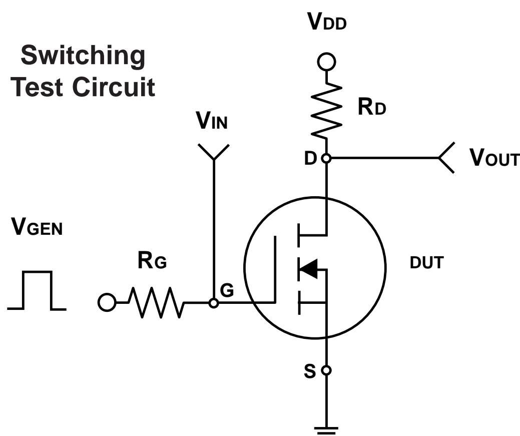
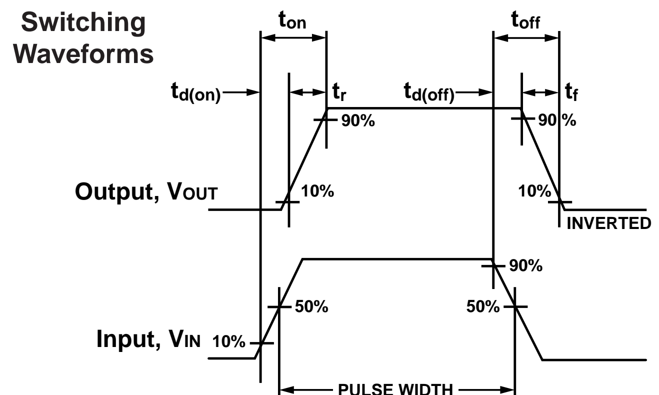
Electrical Characteristics (T_J = 25°C unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS} = 0V, I_D = 250µA	30	–	–	V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250µA	1.0	–	—	V
Gate-Body Leakage	I_{GSS}	V_{DS} = 0V, V_{GS} = ±20V	–	–	±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 30V, V_{GS} = 0V	–	–	0.5	µA
		V_{DS}=30V, V_{GS}=0V, T_J=55°C	–	–	10	
On-State Drain Current[1]	$I_{D(on)}$	V_{DS} ≥ 4.5V, V_{GS} = 10V	6	–	–	A
		V_{DS} ≥ 4.5V, V_{GS} = 4.5V	4	–	–	
Drain-Source On-State Resistance[1]	$R_{DS(on)}$	V_{GS} = 10V, I_D = 2.5A	–	0.096	0.117	Ω
		V_{GS} = 4.5V, I_D = 2.0A	–	0.135	0.190	
Forward Transconductance[1]	g_{fs}	V_{DS} = 4.5V, I_D = 2.5A	–	4.6	–	S
Dynamic						
Total Gate Charge	Q_g	V_{DS} = 15V, V_{GS} = 10V I_D = 2.5A	–	3.7	10	nC
Gate-Source Charge	Q_{gs}		–	0.5	–	
Gate-Drain Charge	Q_{gd}		–	0.6	–	
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = 15V, R_L = 15Ω I_D ≈ 1A, V_{GEN} = 10V R_G = 6Ω	–	6	20	ns
Rise Time	t_r		–	8.8	30	
Turn-Off Delay Time	$t_{d(off)}$		–	26	35	
Fall Time	t_f		–	2.4	20	
Input Capacitance	C_{iss}	V_{GS} = 0V V_{DS} = 15V f = 1.0MHz	–	163	–	pF
Output Capacitance	C_{oss}		–	27	–	
Reverse Transfer Capacitance	C_{rss}		–	9	–	
Source-Drain Diode						
Maximum Diode Forward Current	I_S	—	—	—	2.1	A
Diode Forward Voltage	V_{SD}	I_S = 1.25A, V_{GS} = 0V	–	0.82	1.2	V

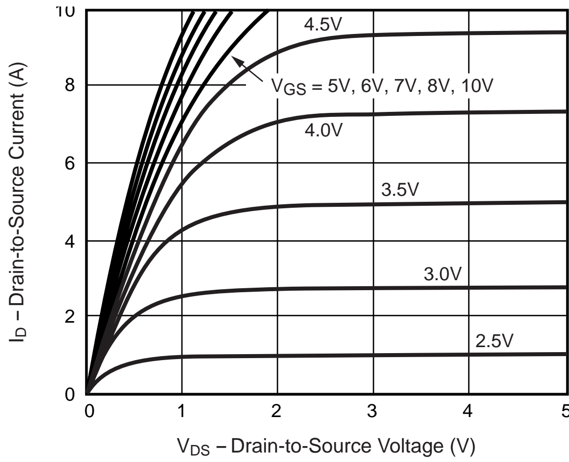
Note: (1) Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2%





N-Channel Enhancement-Mode MOSFET

Ratings and Characteristic Curves (T_A = 25°C unless otherwise noted)



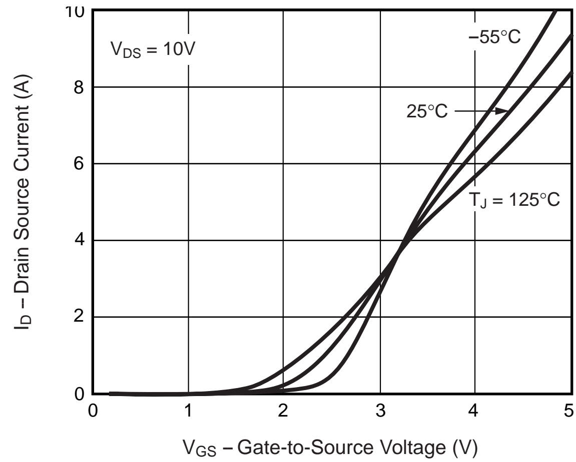


Fig. 3 – Capacitance

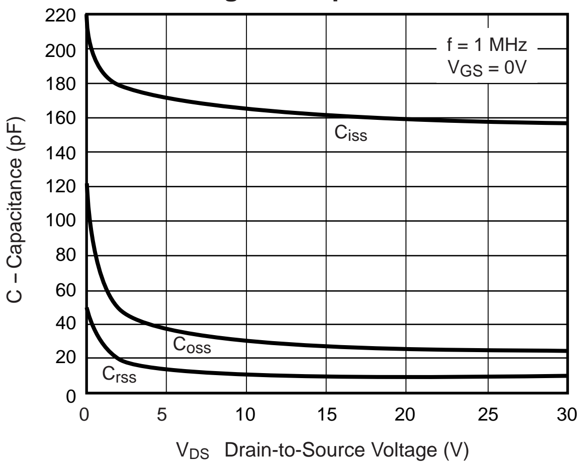


Fig. 4 – On-Resistance vs. Drain Current

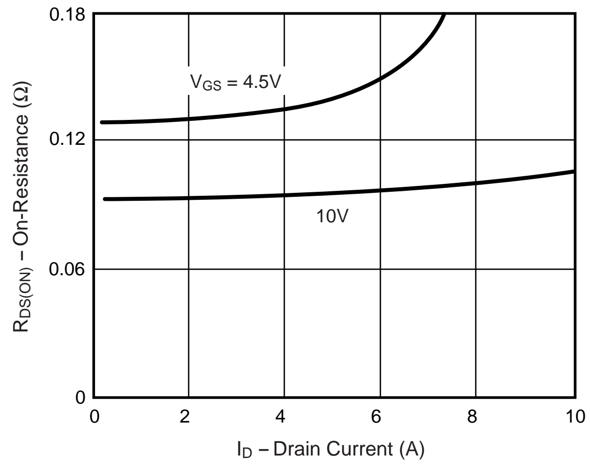
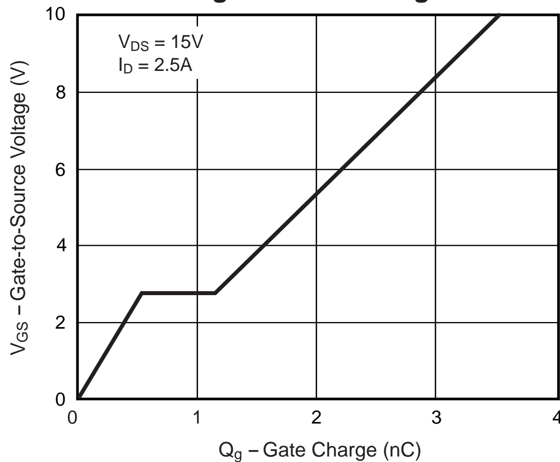


Fig. 5 – Gate Charge



Ratings and Characteristic Curves (T_A = 25°C unless otherwise noted)

Fig. 6 – On-Resistance vs. Gate-to-Source Voltage

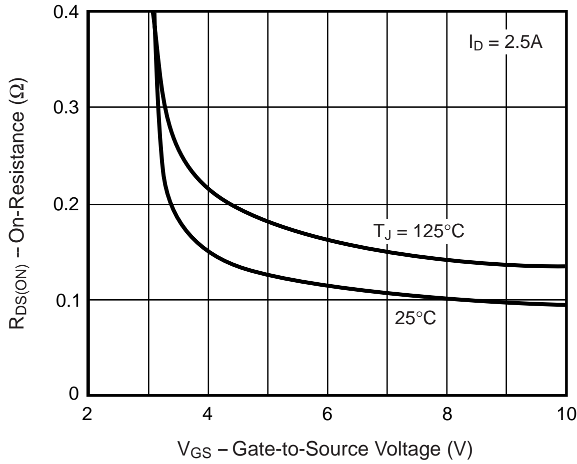


Fig. 7 – Source-Drain Diode Forward Voltage

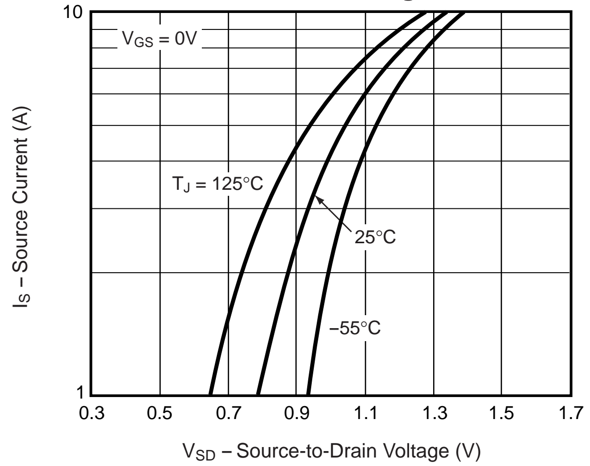


Fig. 8 – Breakdown Voltage vs. Junction Temperature

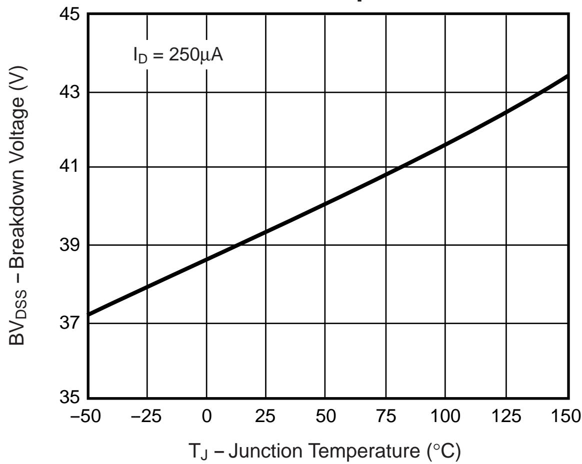
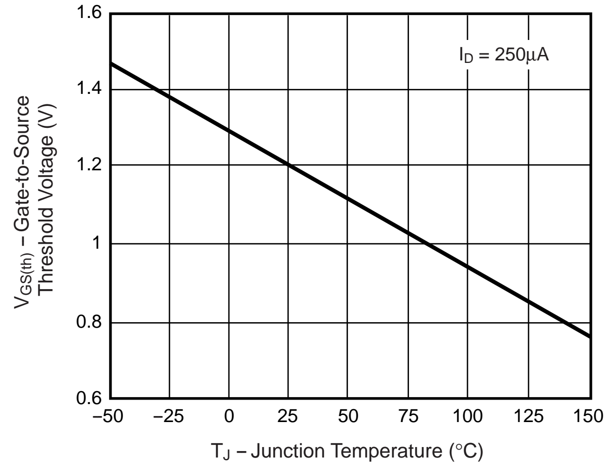


Fig. 9 – Threshold Voltage



Ratings and Characteristic Curves (T_A = 25°C unless otherwise noted)

Fig. 10 – On-Resistance vs. Junction Temperature

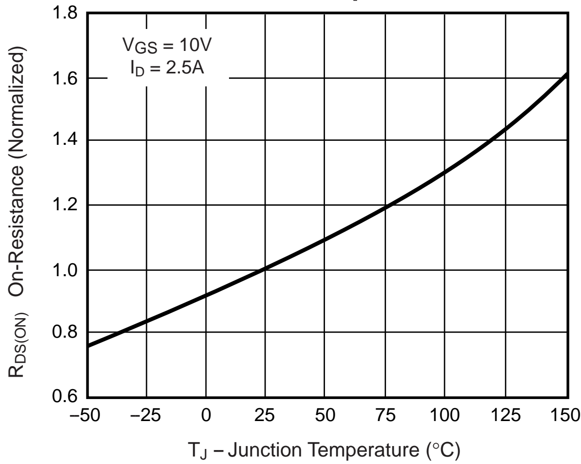


Fig. 11 – Thermal Impedance

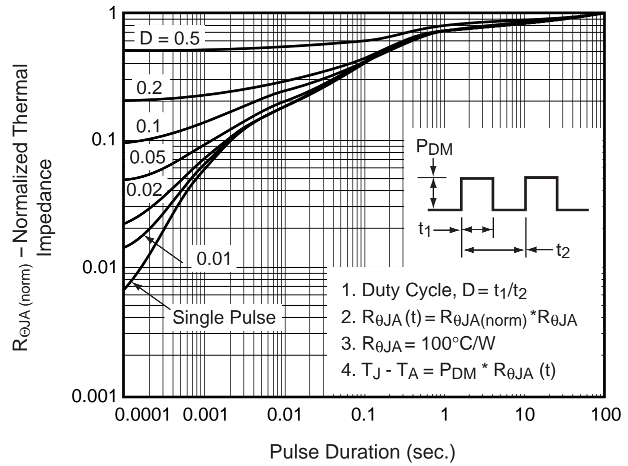


Fig. 12 – Power vs. Pulse Duration

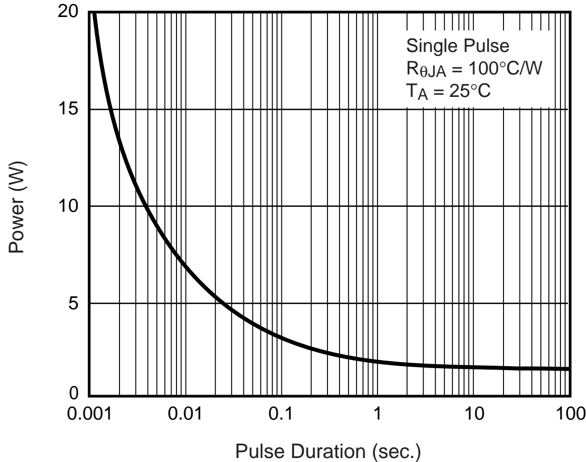


Fig. 13 – Maximum Safe Operating Area