GENERAL SEMICONDUCTOR®

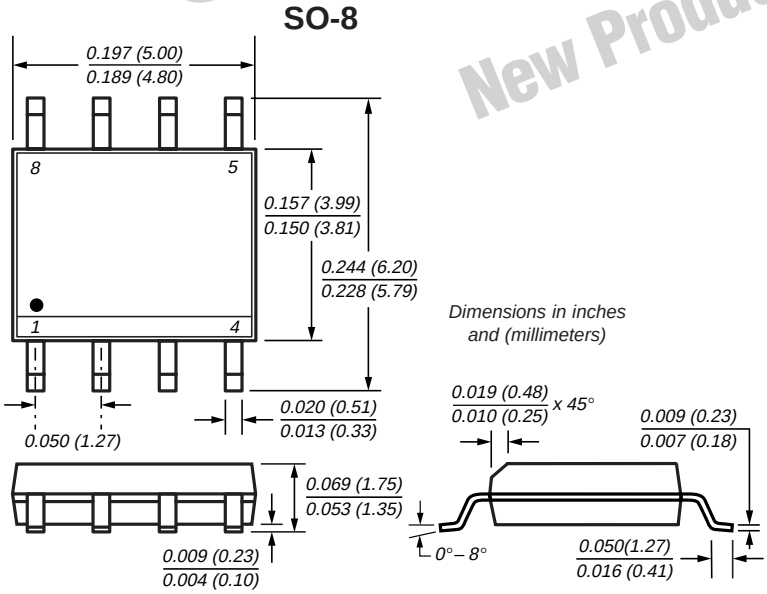
GF4450

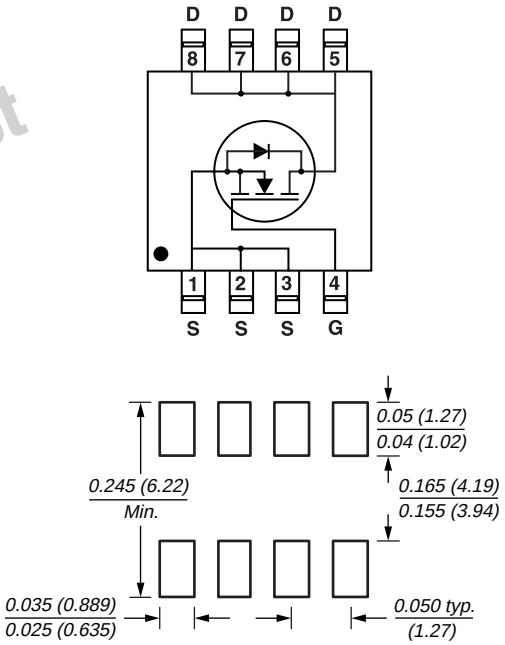
N-Channel Enhancement-Mode MOSFET

V_{DS} 60V $R_{DS(ON)}$ 24mΩ I_D 7.5A

TRENCH GENFET®

New Product





Mounting Pad Layout

Mechanical Data

Case: SO-8 molded plastic body

Terminals: Leads solderable per MIL-STD-750, Method 2026

High temperature soldering guaranteed: 250°C/10 seconds at terminals

Mounting Position: Any

Weight: 0.5g

Features

- Advanced Trench Process Technology
- High Density Cell Design for Ultra Low On-Resistance
- Specially Designed for Low Voltage DC/DC Converters
- Fast Switching for High Efficiency

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

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	60	V
Gate-Source Voltage		V_{GS}	±20	
Continuous Drain Current(1)		I_D	7.5	A
Pulsed Drain Current		I_{DM}	50	
Maximum Power Dissipation(1)	T_A = 25°C T_A = 70°C	P_D	2.5 1.6	W
Operating Junction and Storage Temperature Range		T_J, T_{stg}	–55 to 150	°C
Junction-to-Ambient Thermal Resistance(1)		$R_{\theta JA}$	50	°C/W

Note: (1) Surface Mounted on FR4 Board, t ≤ 10s

7/10/01

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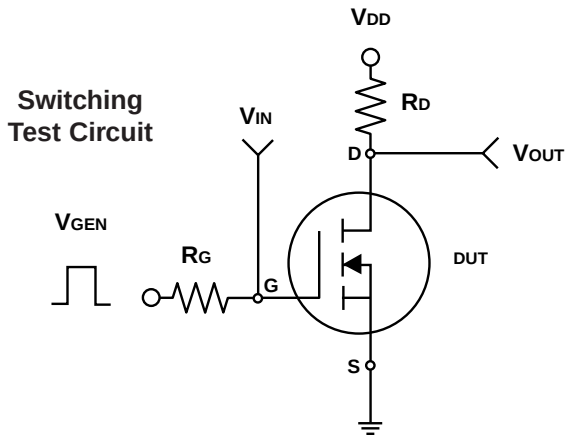
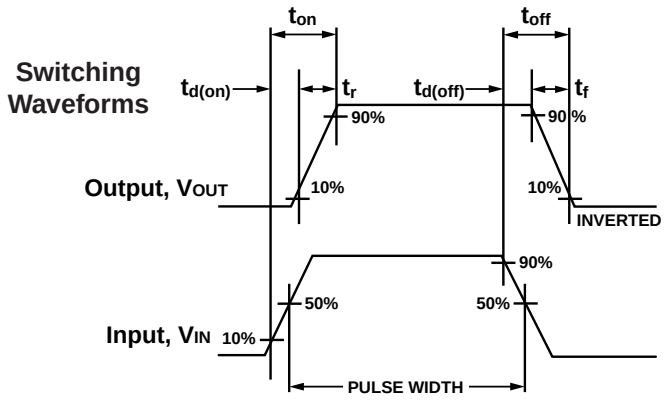
Electrical Characteristics (T_J = 25°C unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS} = 0V, I_D = 250µA	60	–	–	V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250µA	2.0	–	–	V
Gate-Body Leakage	I_{GSS}	V_{DS} = 0V, V_{GS} = ±20V	–	–	±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 60V, V_{GS} = 0V	–	–	1.0	µA
On-State Drain Current[2]	$I_{D(on)}$	V_{DS} ≥ 5V, V_{GS} = 10V	20	–	–	A
Drain-Source On-State Resistance[2]	$R_{DS(on)}$	V_{GS} = 10V, I_D = 7.5A	–	12	24	mΩ
		V_{GS} = 6.0V, I_D = 6.5A	–	14	30	
Forward Transconductance[2]	g_{fs}	V_{DS} = 15V, I_D = 7.5A	–	36	–	S
Dynamic						
Total Gate Charge	Q_g	V_{DS} = 30V, V_{GS} = 10V I_D = 7.5A	–	65	91	nC
Gate-Source Charge	Q_{gs}		–	12	–	
Gate-Drain Charge	Q_{gd}		–	14	–	
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = 30V, R_L = 30Ω I_D ≈ 1A, V_{GEN} = 10V R_G = 6Ω	–	17	30	ns
Rise Time	t_r		–	13	20	
Turn-Off Delay Time	$t_{d(off)}$		–	78	117	
Fall Time	t_f		–	31	40	
Input Capacitance	C_{iss}	V_{GS} = 0V V_{DS} = 30V f = 1.0MHz	–	3147	–	pF
Output Capacitance	C_{oss}		–	283	–	
Reverse Transfer Capacitance	C_{rss}		–	140	–	
Source-Drain Diode						
Diode Forward Voltage	V_{SD}	I_S = 2.1A, V_{GS} = 0V	–	0.71	1.2	V
Max. Diode Forward Current	I_S		–	–	2.1	A

Notes: (1) Surface Mounted on FR4 Board, t ≤ 10s
(2) Pulse test; pulse width ≤ 300µs, duty cycle ≤ 2%





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

Fig. 1 – Output Characteristics

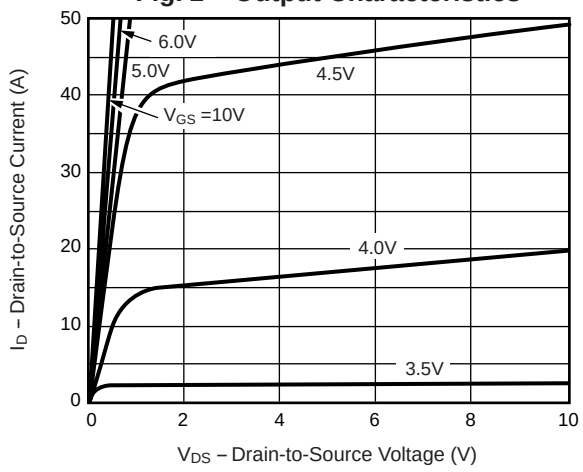

Fig. 2 – Transfer Characteristics

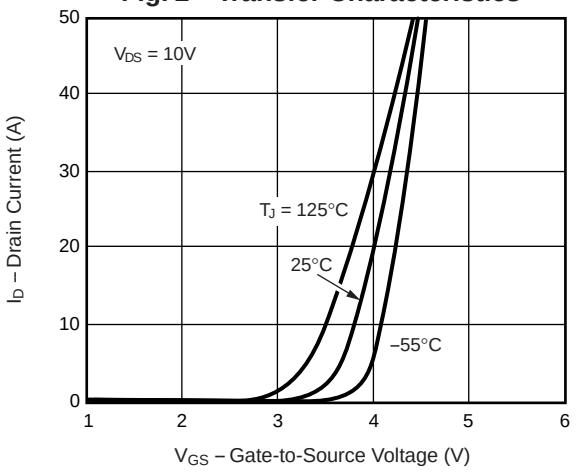

Fig. 3 – Threshold Voltage vs. Temperature

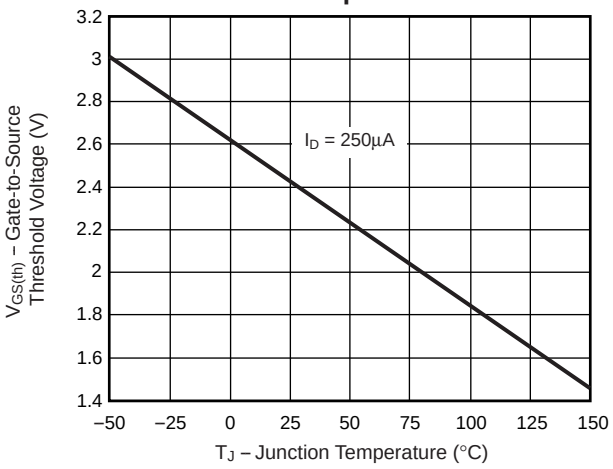

Fig. 4 – On-Resistance vs. Drain Current

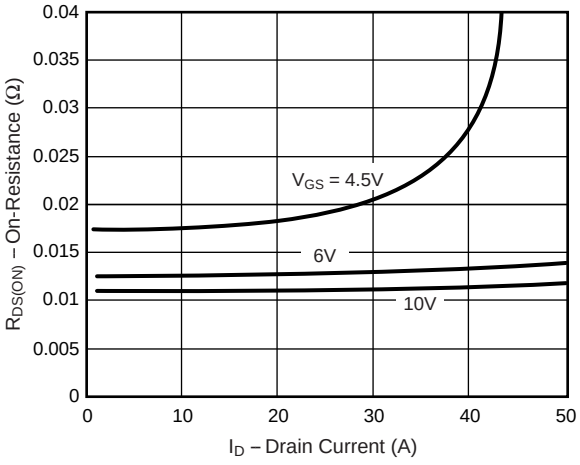

Fig. 5 – On-Resistance vs. Junction Temperature

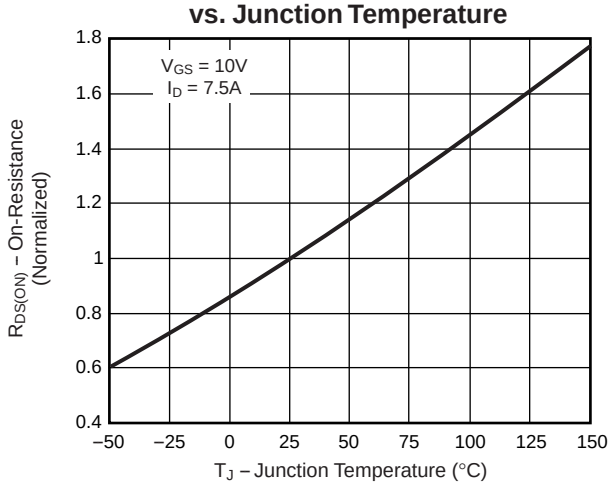

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Fig. 6 – On-Resistance vs. Gate-to-Source Voltage

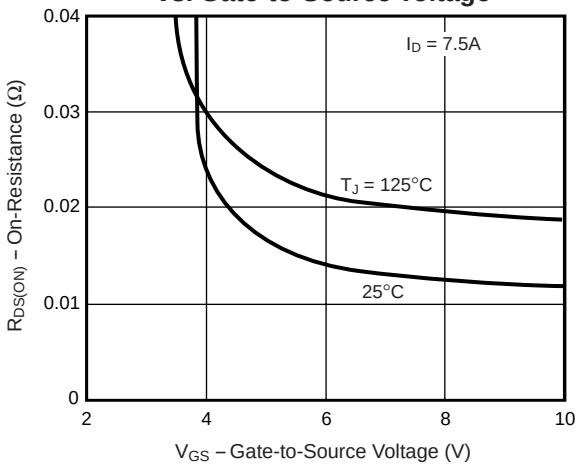


Fig. 7 – Gate Charge

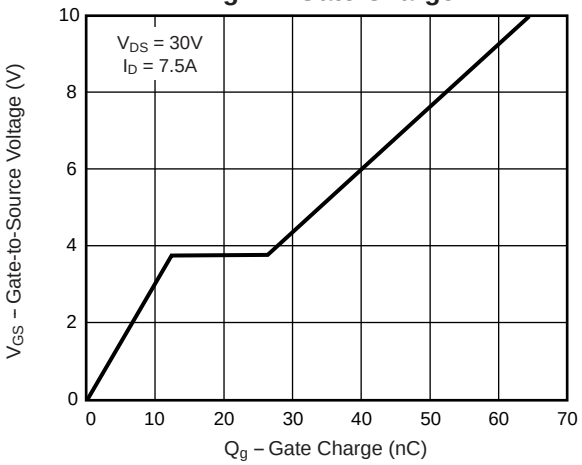


Fig. 8 – Capacitance

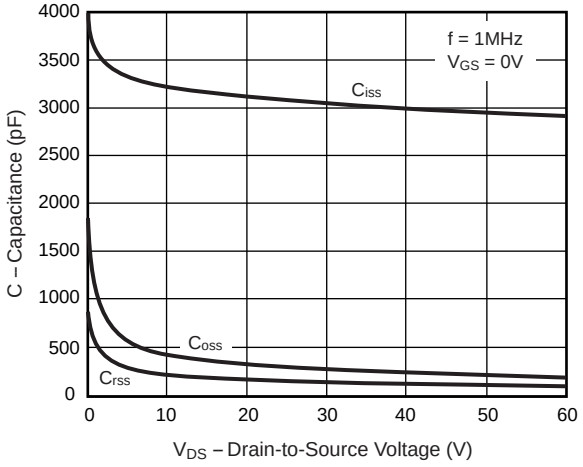
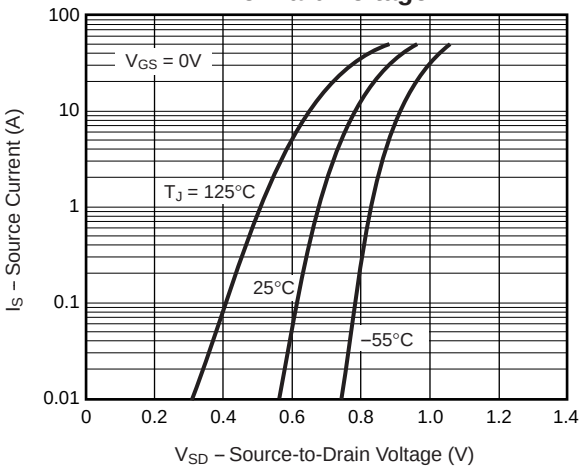


Fig. 9 – Source-Drain Diode Forward Voltage



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

Fig. 10 – Breakdown Voltage vs. Junction Temperature

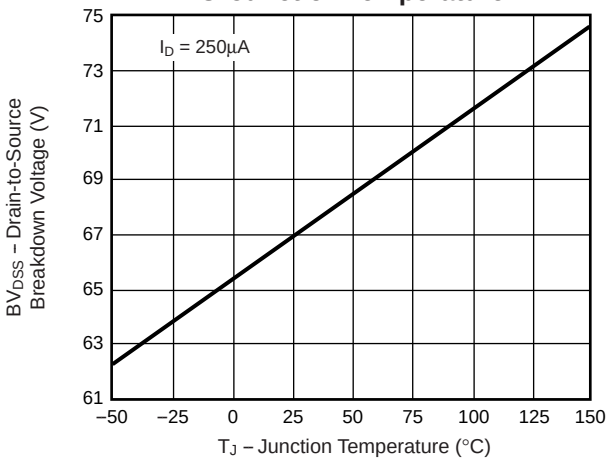

Fig. 11 – Transient Thermal Impedance

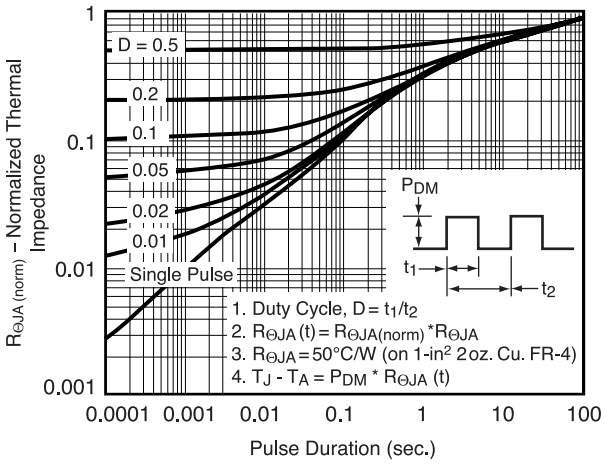

Fig. 12 – Power vs. Pulse Duration

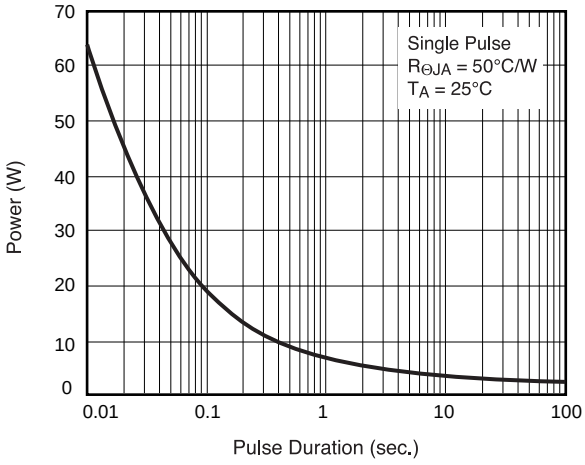

Fig. 13 – Maximum Safe Operating Area