GENERAL SEMICONDUCTOR®

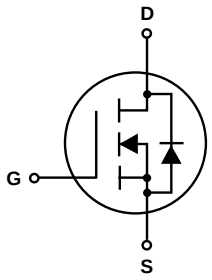
GFD25N03

N-Channel Enhancement-Mode MOSFET

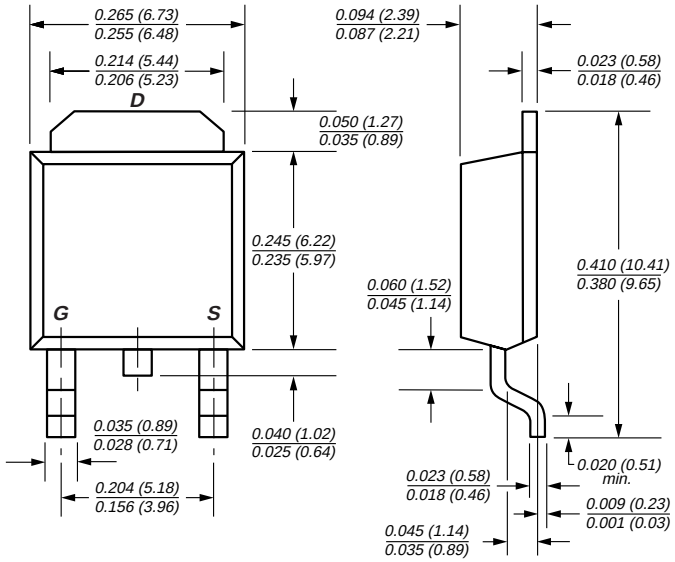
V_{DS} 30V $R_{DS(ON)}$ 16.5mΩ I_D 38A

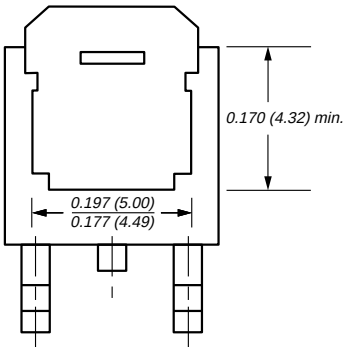
TRENCH GENFET®

New Product

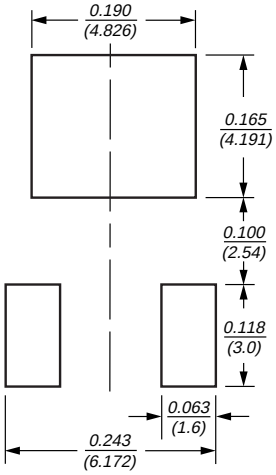


TO-252 (DPAK)





Dimensions in inches and (millimeters)



Mounting Pad Layout

Mechanical Data

Case: JEDEC TO-252 molded plastic body

Terminals: Solder plated, solderable per MIL-STD-750, Method 2026

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

Weight: 0.011oz., 0.4g

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
- Low Gate Charge

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

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	±20	
Continuous Drain Current T_J = 150°C	T_C = 25°C T_C = 70°C	I_D	38 30	A
Pulsed Drain Current(1)		I_{DM}	80	
Power Dissipation T_J = 150°C	T_C = 25°C T_C = 70°C T_A = 25°C(2)	P_D	38 24 2.5	W
Operating Junction and Storage Temperature Range		T_J, T_{stg}	–55 to 150	°C
Junction-to-Case Thermal Resistance		$R_{\theta JC}$	3.3	°C/W
Junction-to-Ambient Thermal Resistance(2)		$R_{\theta JA}$	50	°C/W

Notes: (1) Pulse width limited by maximum junction temperature
(2) Surface mounted on a 1in^2 2 oz.. Cu PCB (FR-4 material)

9/17/01

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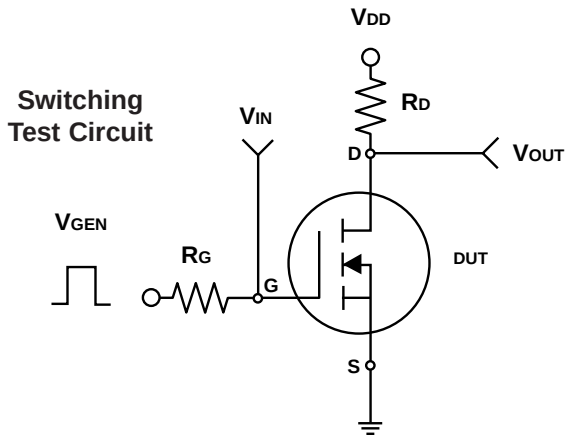
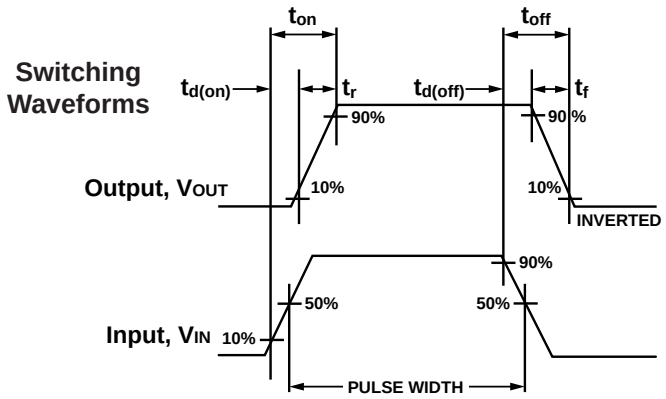
N-Channel Enhancement-Mode MOSFET

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	0.8	–	2.5	V
Gate-Body Leakage	I_{GSS}	V_{GS} = ±20V, V_{DS} = 0V	–	–	±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 24V, V_{GS} = 0V	–	–	1	μA
		V_{DS} = 24V, V_{GS} = 0V, T_J = 125°C	–	–	10	
On-State Drain Current[1]	$I_{D(on)}$	V_{DS} ≥ 5V, V_{GS} = 10V	80	–	–	A
Drain-Source On-State Resistance[1]	$R_{DS(on)}$	V_{GS} = 10V, I_D = 19A	–	12.5	16.5	mΩ
		V_{GS} = 4.5V, I_D = 15A	–	19	25	
Forward Transconductance[1]	g_{fs}	V_{DS} = 5V, I_D = 19A	–	25	–	S
Dynamic						
Total Gate Charge	Q_g	V_{DS} = 15V, V_{GS} = 5V, I_D = 19A	–	11	14	nC
		V_{DS} = 15V, I_D = 19A, V_{GS} = 10V	–	22	28	
Gate-Source Charge	Q_{gs}		–	3.4	–	
Gate-Drain Charge	Q_{gd}		–	3.4	–	
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = 15V, I_D = 1A, V_{GEN} = 10V, R_G = 6Ω	–	10	18	ns
Turn-On Rise Time	t_r		–	14	25	
Turn-Off Delay Time	$t_{d(off)}$		–	38	60	
Turn-Off Fall Time	t_f		–	6	10	
Input Capacitance	C_{iss}	V_{DS} = 15V, V_{GS} = 0V, f = 1.0MHz	–	1173	–	pF
Output Capacitance	C_{oss}		–	199	–	
Reverse Transfer Capacitance	C_{rss}		–	112	–	
Source-Drain Diode						
Diode Forward Voltage[1]	V_{SD}	I_S = 19A, V_{GS} = 0V	–	0.9	1.2	V
Continuous Source Current (Diode Conduction)	I_S	–	–	–	30	A

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





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

Fig. 1 – Output Characteristics

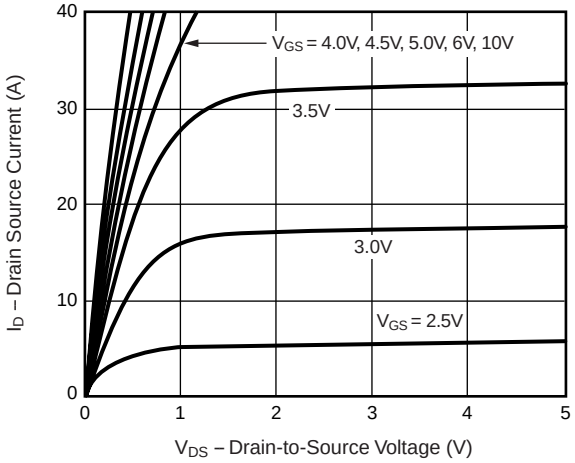


Fig. 2 – Transfer Characteristics

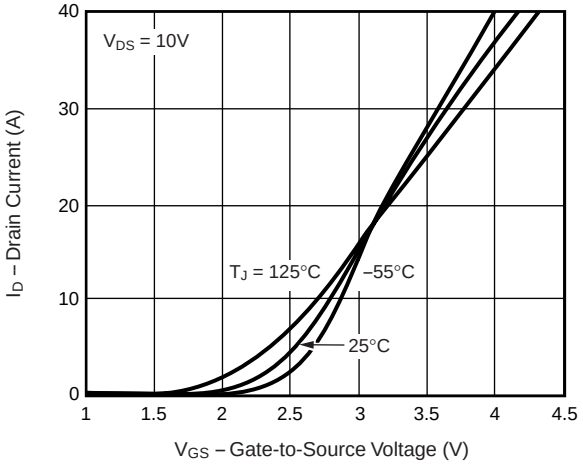


Fig. 3 – Threshold Voltage vs. Temperature

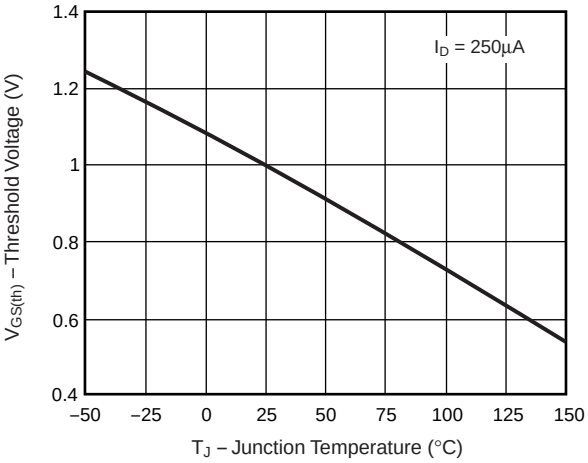


Fig. 4 – On-Resistance vs. Drain Current

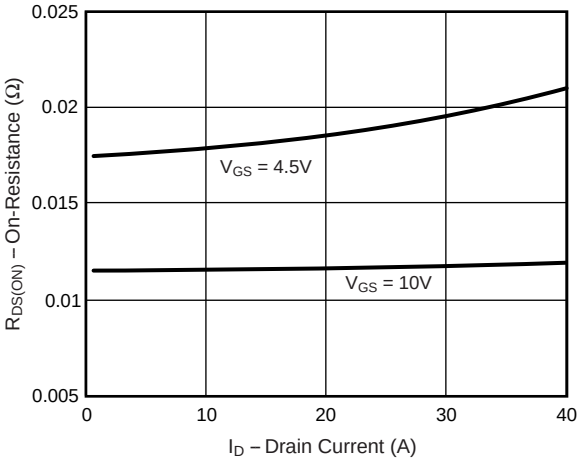
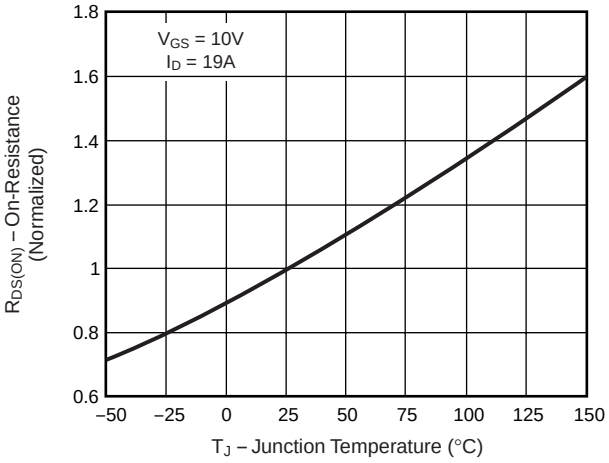


Fig. 5 – On-Resistance vs. Junction Temperature



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

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

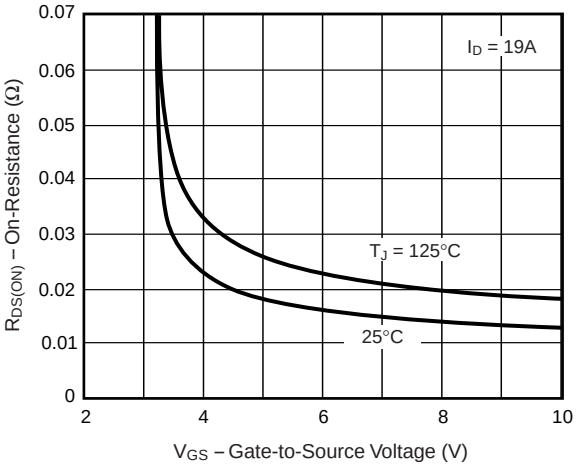


Fig. 7 – Gate Charge

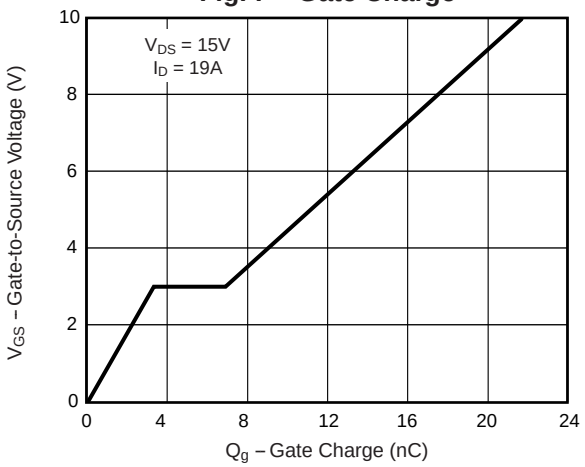


Fig. 8 – Capacitance

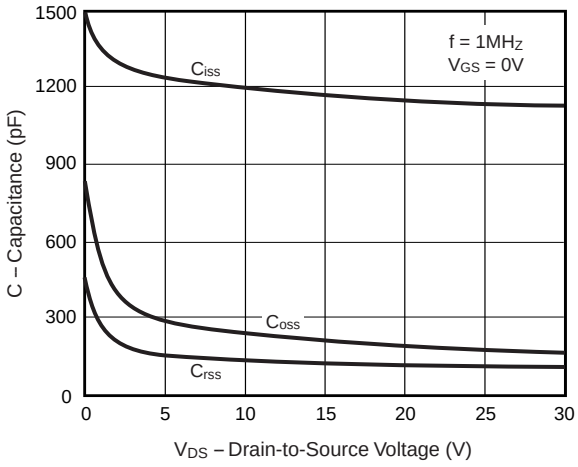


Fig. 9 – Source-Drain Diode Forward Voltage