GENERAL SEMICONDUCTOR®

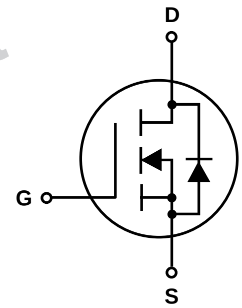
GFB60N03

N-Channel Enhancement-Mode MOSFET

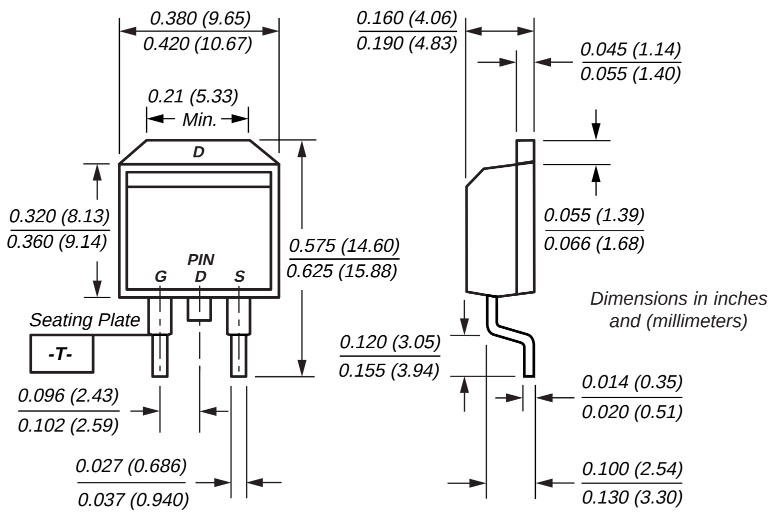
V_{DS} 30V $R_{DS(ON)}$ 11mΩ I_D 60A

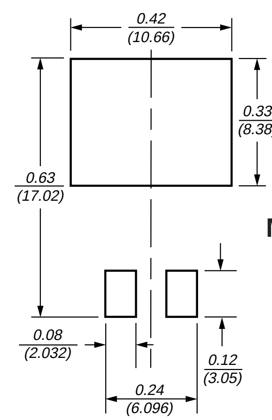
TRENCH GENFET®

New Product



TO-263AB





Mounting Pad Layout

Mechanical Data

Case: JEDEC TO-263 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:** 1.3g

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_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(1)		I_D	60	A
Pulsed Drain Current		I_{DM}	100	
Maximum Power Dissipation	T_C = 25°C T_C = 100°C	P_D	62.5 25	W
Operating Junction and Storage Temperature Range		T_J, T_{stg}	–55 to 150	°C
Lead Temperature (1/8" from case for 5 sec.)		T_L	275	°C
Junction-to-Case Thermal Resistance		$R_{\theta JC}$	2.0	°C/W
Junction-to-Ambient Thermal Resistance(2)		$R_{\theta JA}$	40	°C/W

Notes: (1) Maximum DC current limited by the package
(2) 1-in^2 2oz. Cu PCB mounted

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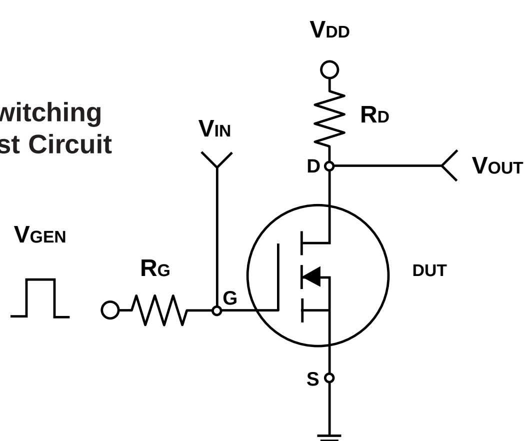
Electrical Characteristics (T_J = 25°C unless otherwise noted)

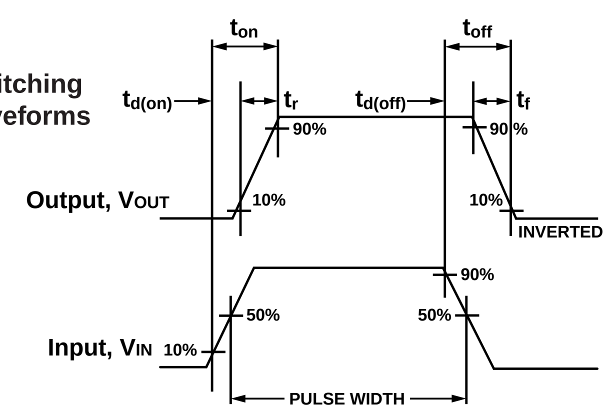
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS} = 0V, I_D = 250µA	30			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250µA	1.0		3.0	V
Gate-Body Leakage	I_{GSS}	V_{DS} = 0V, V_{GS} = ±20V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 30V, V_{GS} = 0V			1	µA
On-State Drain Current(1)	$I_{D(on)}$	V_{DS} ≥ 5V, V_{GS} = 10V	60			A
Drain-Source On-State Resistance(1)	$R_{DS(on)}$	V_{GS} = 10V, I_D = 30A		9	11	mΩ
		V_{GS} = 4.5V, I_D = 25A		13	16	
Forward Transconductance(1)	g_{fs}	V_{DS} = 10V, I_D = 25A		40		S
Diode Forward Voltage	V_{SD}	I_S = 25A, V_{GS} = 0V		0.9	1.3	V
Dynamic(1)						
Total Gate Charge	Q_g	V_{DS}=15V, V_{GS}=5V, I_D=50A		16	22	nC
		V_{DS} = 15V, V_{GS} = 10V, I_D = 50A		35	60	
Gate-Source Charge	Q_{gs}			8		
Gate-Drain Charge	Q_{gd}			6		
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = 15V, R_L = 15Ω, I_D ≈ 1A, V_{GEN} = 10V, R_G = 6Ω		11	20	ns
Rise Time	t_r			11	20	
Turn-Off Delay Time	$t_{d(off)}$			48	80	
Fall Time	t_f			15	30	
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 15V, f = 1.0MHz	–	1850	–	pF
Output Capacitance	C_{oss}		–	315	–	
Reverse Transfer Capacitance	C_{rss}		–	145	–	
Source-Drain Reverse Recovery Time	t_{rr}	I_F = 25A, di/dt = 100A/µs		160		ns

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

Switching Test Circuit



Switching Waveforms



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

Fig. 1 – Output Characteristics

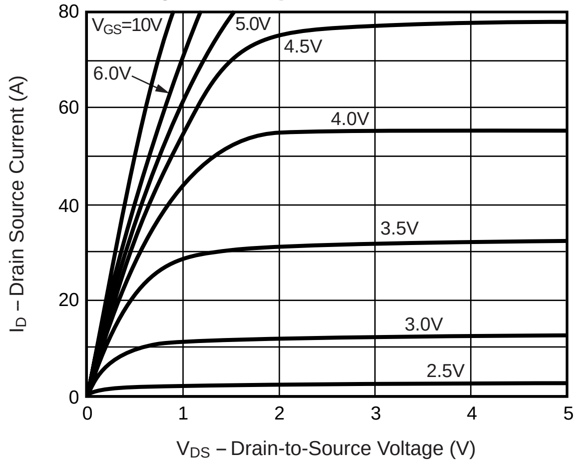


Fig. 2 – Transfer Characteristics

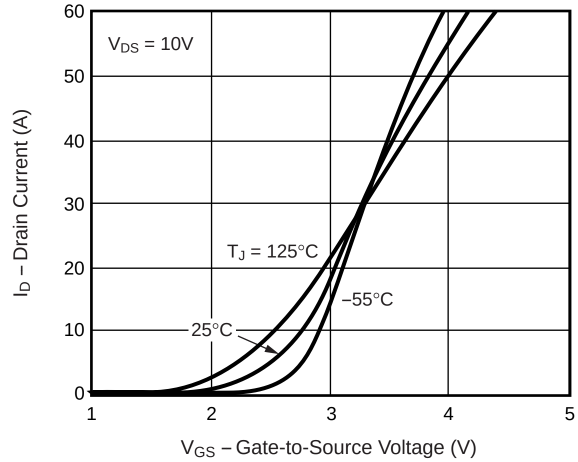


Fig. 3 – Threshold Voltage vs. Temperature

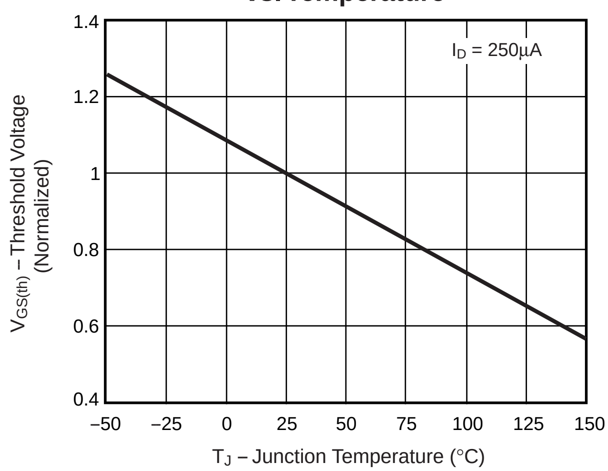


Fig. 4 – On-Resistance vs. Drain Current

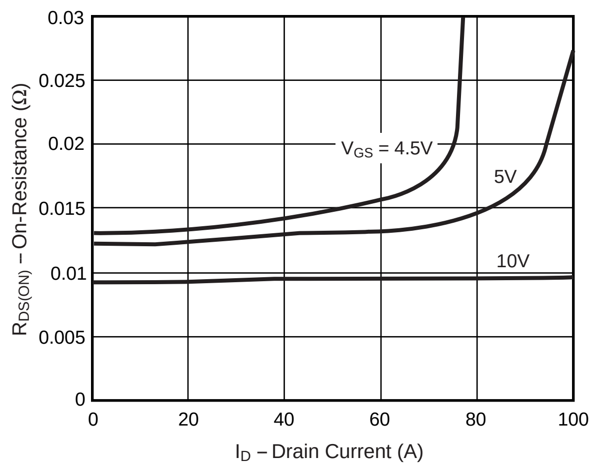
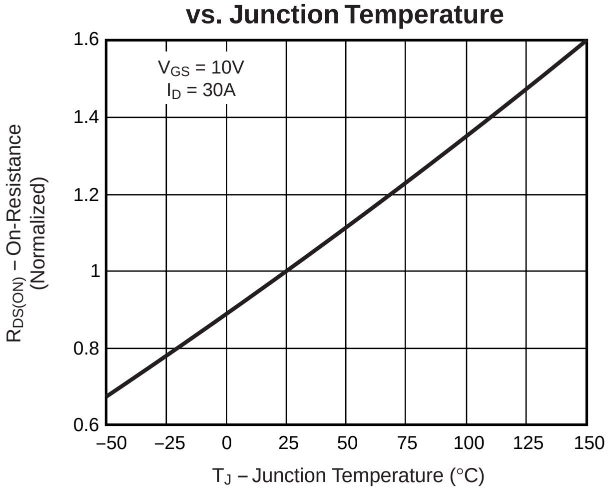


Fig. 5 – On-Resistance vs. Junction Temperature



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

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

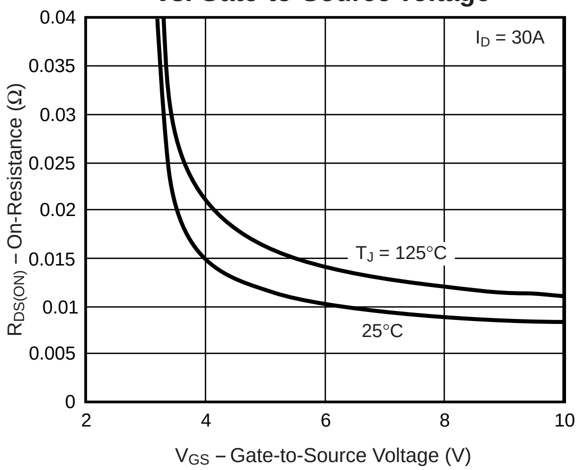

Fig. 7 – Gate Charge

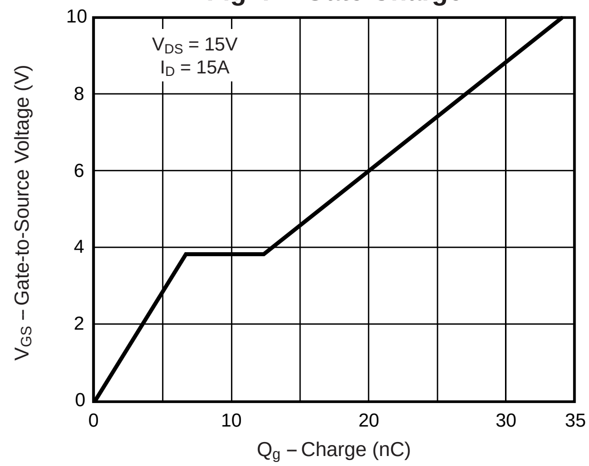

Fig. 8 – Capacitance

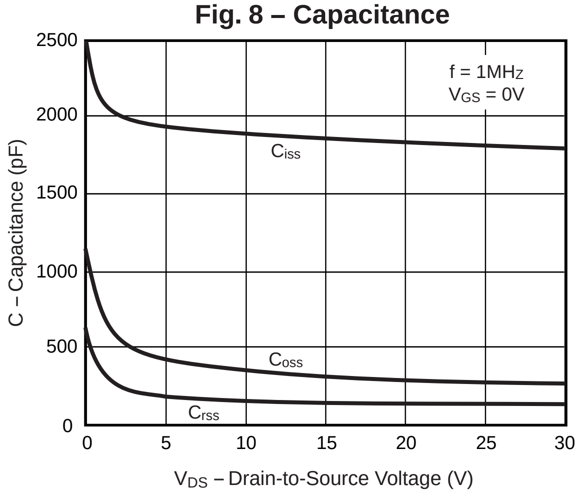

Fig. 9 – Source-Drain Diode Forward Voltage

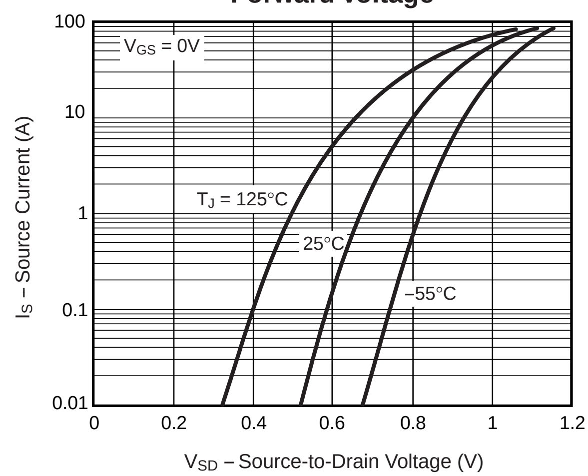

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Fig. 10 – Breakdown Voltage vs. Junction Temperature

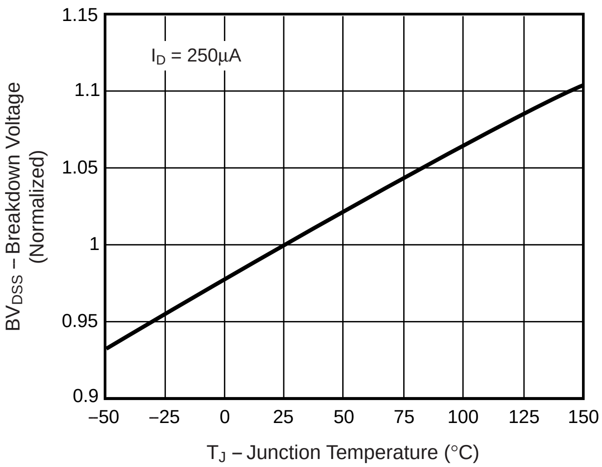

Fig. 11 – Transient Thermal Impedance

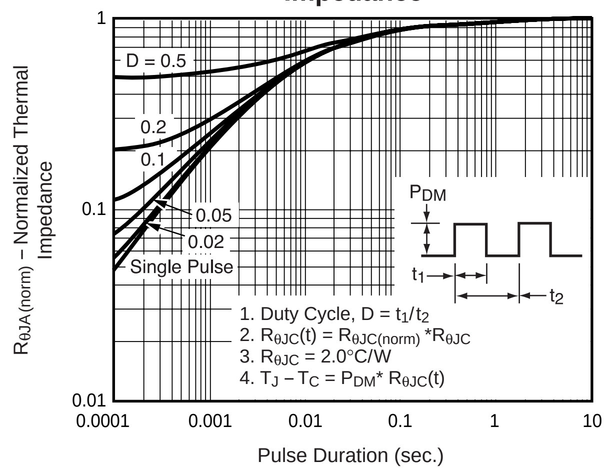

Fig. 12 – Power vs. Pulse Duration

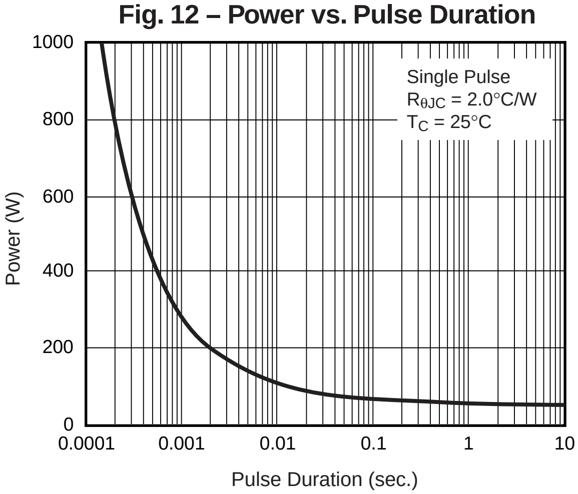

Fig. 13 – Maximum Safe Operating Area