GENERAL SEMICONDUCTOR®

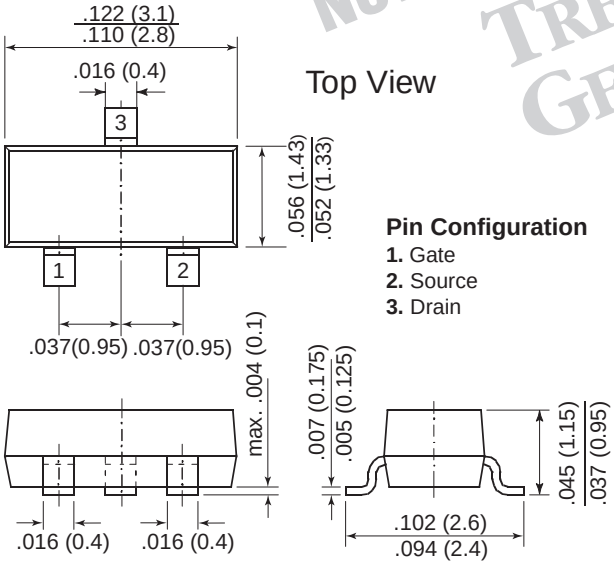
BSN20

N-Channel Enhancement-Mode MOSFET

V_{DS} 50V **$R_{DS(ON)}$** 6Ω **I_D** 180mA

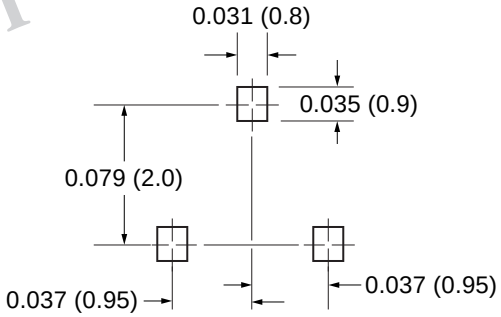
TO-236AB (SOT-23)

New Product
TRENCH
GENFET®



Pin Configuration
1. Gate
2. Source
3. Drain

Dimensions in inches and (millimeters)



Mounting Pad Layout

Mechanical Data

Case: SOT-23 Plastic Package
Weight: approx. 0.008g
Marking Code: B20

Features

- Advanced Trench Process Technology
- High density cell design for ultra-low on-resistance
- High input impedance
- High-speed switching
- No minority carrier storage time
- CMOS logic compatible input
- No secondary breakdown

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

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	50	V
Gate-Source-Voltage		V_{GS}	±20	V
Continuous Drain Current (1)	T_A = 25°C T_A = 70°C	I_D	180 145	mA
Pulsed Drain Current (2)		I_{DM}	1300	mA
Power Dissipation (1)	T_A = 25°C T_A = 70°C	P_D	350 225	mW
Operating Junction and Storage Temperature Range		T_J, T_{stg}	–55 to +150	°C
Maximum Junction-to-Ambient Thermal Resistance (1)		$R_{\theta JA}$	350	°C/W

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

4/11/01

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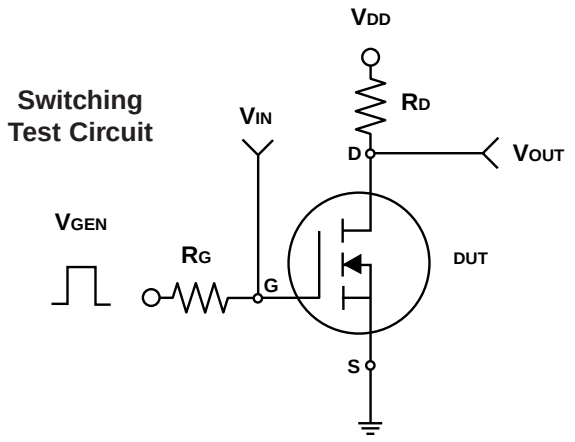
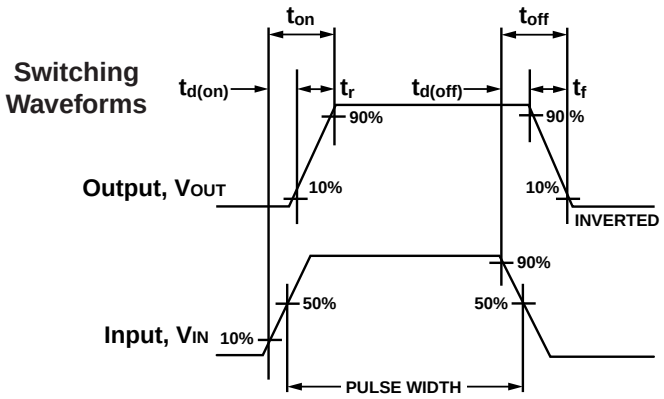
Electrical Characteristics (T_J = 25°C unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS} = 0V, I_D = 10µA	50	—	—	V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 1mA	0.4	—	—	V
		V_{DS}=V_{GS}, I_D=1mA, T_J=150°C	0.3	—	—	
		V_{DS} = V_{GS}, I_D = 250µA	—	—	1.8	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0V, V_{GS} = ±20V	—	—	±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 40V, V_{GS} = 0V	—	—	1.0	µA
		V_{DS}=40V, V_{GS}=0V, T_J=150°C	—	—	10	
Drain-Source On-State Resistance(1)	$R_{DS(on)}$	V_{GS} = 10V, I_D = 100mA	—	1.7	6	Ω
		V_{GS} = 10V, I_D = 100mA, T_J = 150°C	—	—	15	
		V_{GS} = 5V, I_D = 100mA	—	2.5	10	
Forward Transconductance(1)	g_{fs}	V_{DS} = 10V, I_D = 100mA	40	250	—	mS
Dynamic						
Turn-On Time	t_{on}	V_{DD}=20V, V_{GS}=10V, R_D=180Ω	—	4.2	8.0	ns
Turn-Off Time	t_{off}	R_G=50Ω, R_{GS}=50Ω	—	14	20	
Input Capacitance	C_{iss}	V_{GS} = 0V	—	36	50	pF
Output Capacitance	C_{oss}	V_{DS} = 10V	—	7.0	15	
Reverse Transfer Capacitance	C_{rss}	f = 1.0MHz	—	3.3	8.0	
Source-Drain Diode						
Diode Forward Voltage(1)	V_{SD}	I_S = 180mA, V_{GS} = 0V	—	0.85	1.5	V

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





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Ratings and Characteristic Curves

Fig. 1 – Output Characteristics

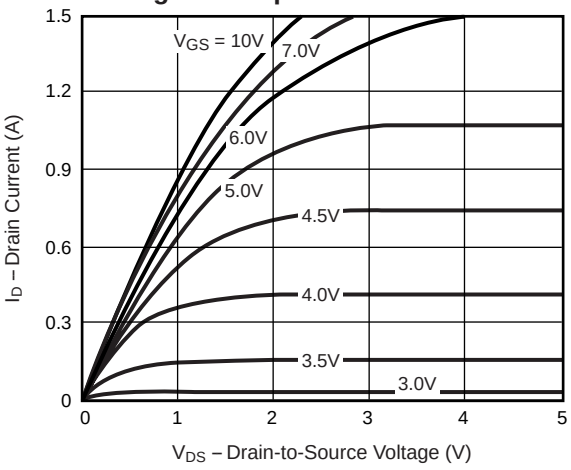

Fig. 2 – Transfer Characteristics

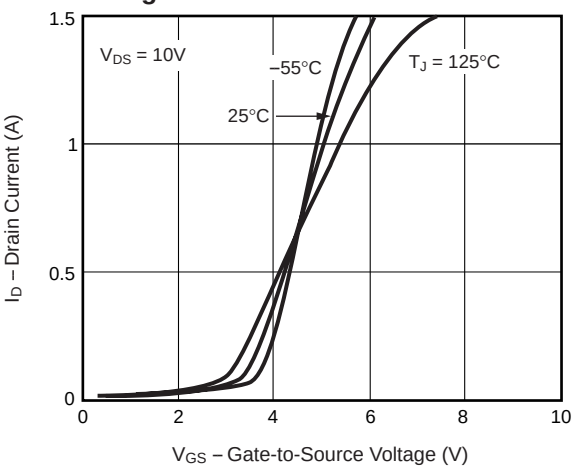

Fig. 3 – Capacitance

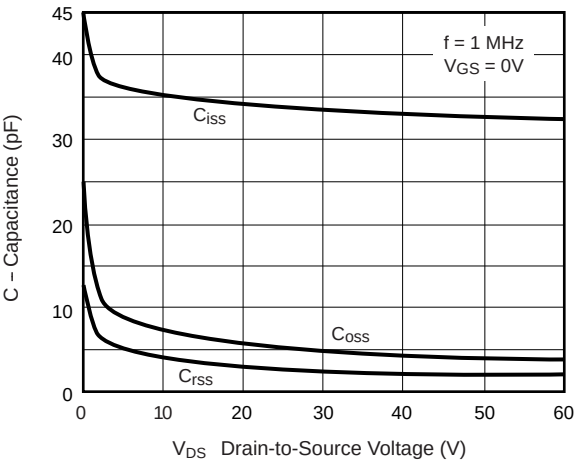

Fig. 4 – On-Resistance vs. Drain Current

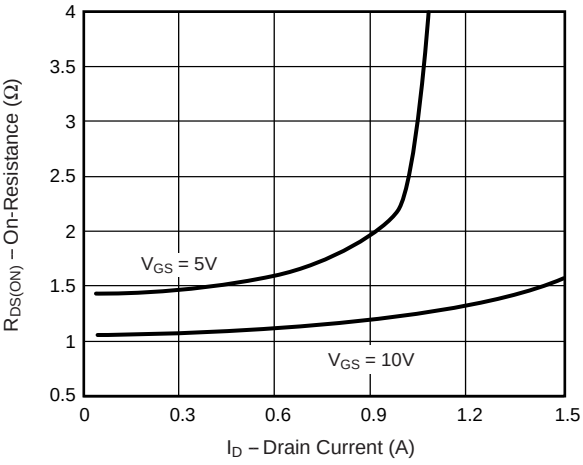

Fig. 5 – Gate Charge

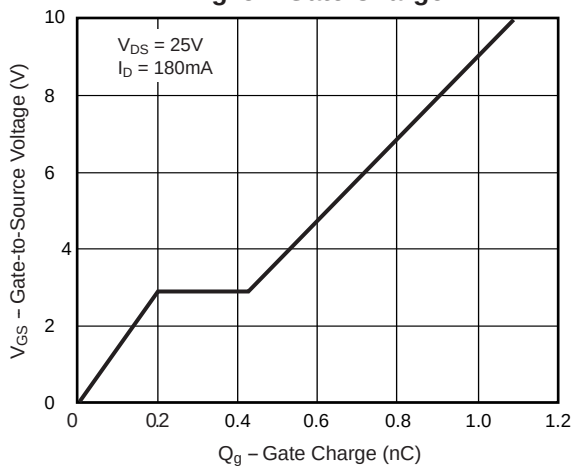

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Fig. 6 – On-Resistance vs. Gate-to-Source Voltage

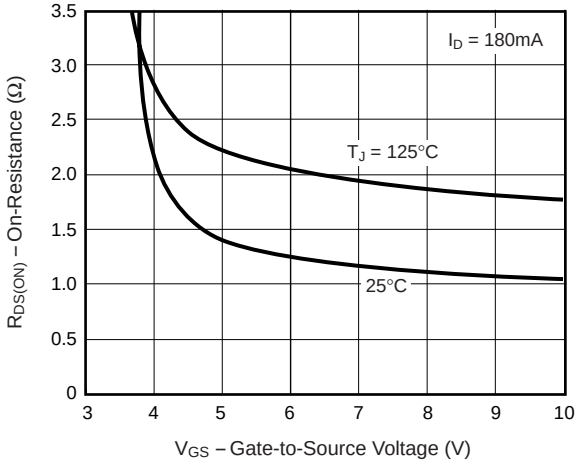

Fig. 7 – Source-Drain Diode Forward Voltage

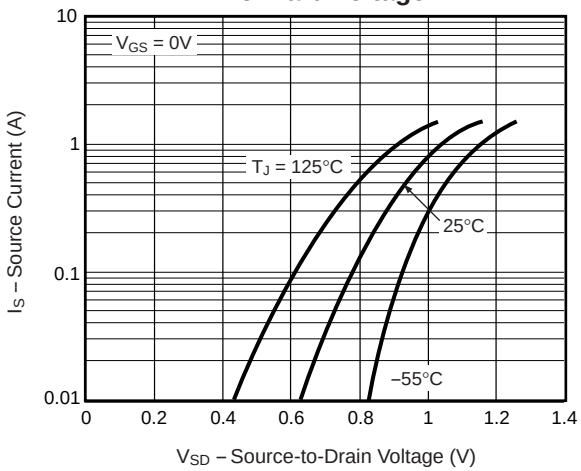

Fig. 8 – Breakdown Voltage vs. Junction Temperature

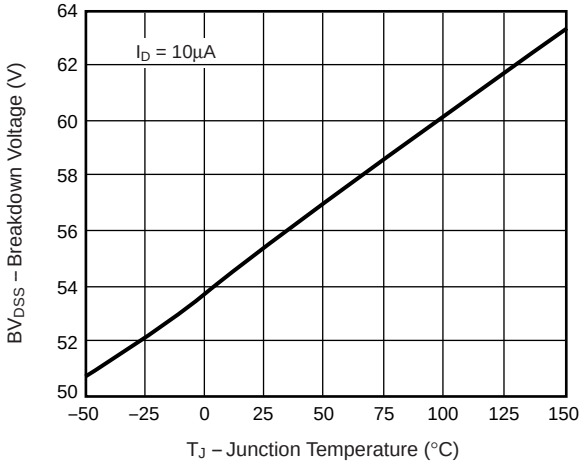

Fig. 9 – Threshold Voltage vs. Junction Temperature

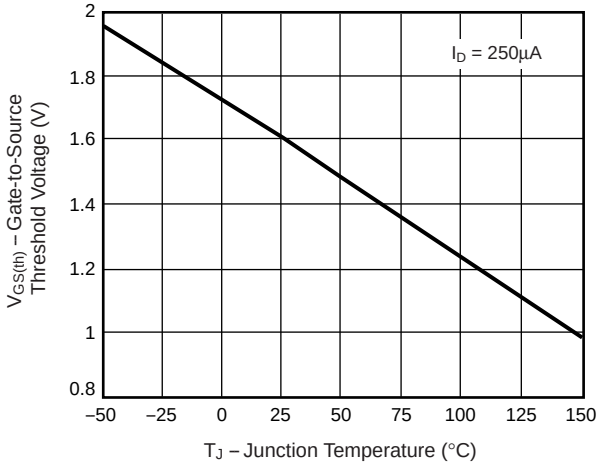

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Fig. 10 – On-Resistance vs. Junction Temperature

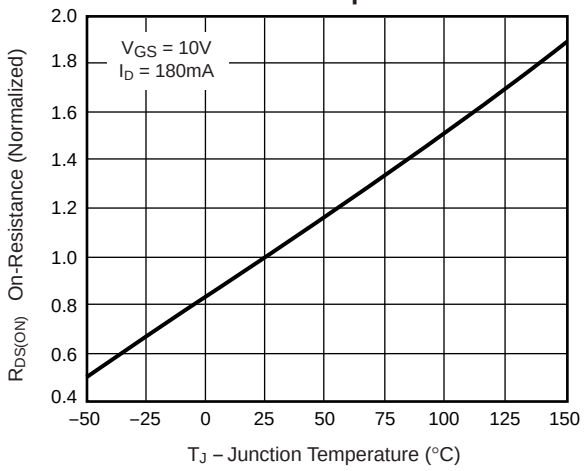

Fig. 11 – Thermal Impedance

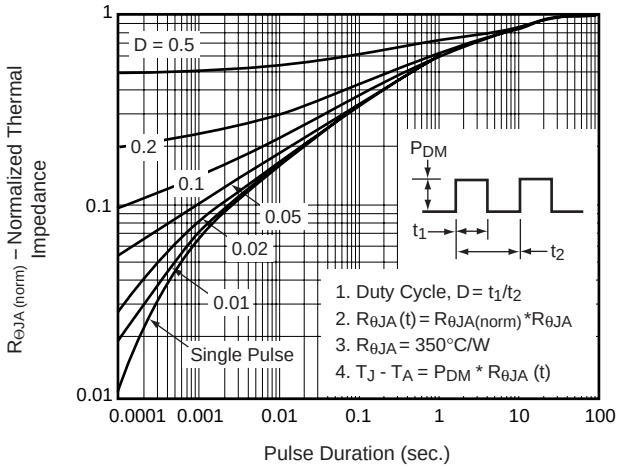

Fig. 12 – Power vs. Pulse Duration

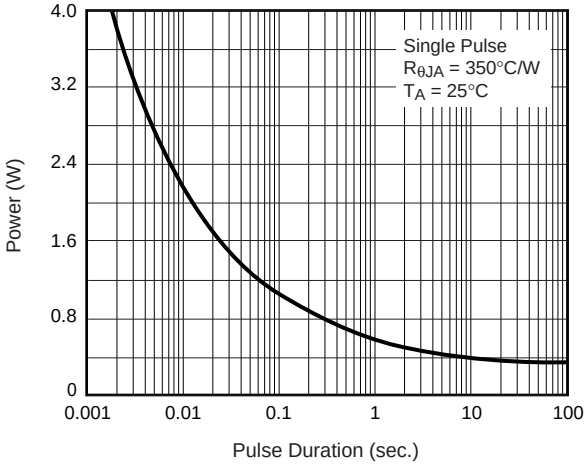

Fig. 13 – Maximum Safe Operating Area