

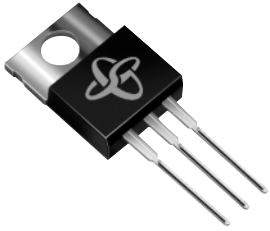
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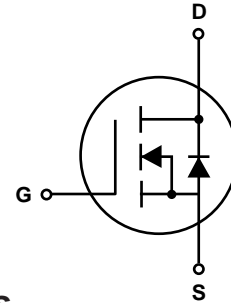
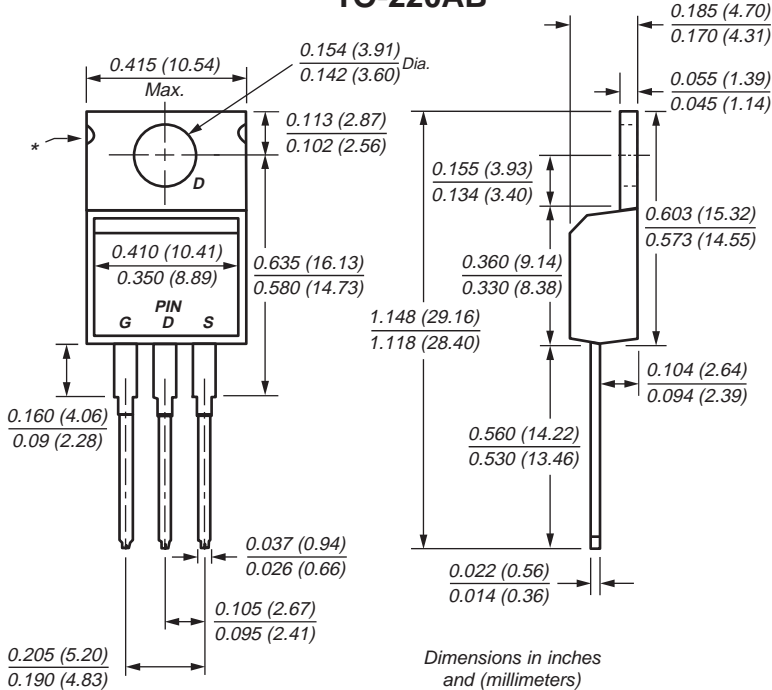


N-Channel Enhancement-Mode MOSFET

V_{DS} 55V $R_{DS(ON)}$ 20m Ω I_D 49A

TRENCH GENFET®
New Product

TO-220AB



Features

- Dynamic dv/dt Rating
- Repetitive Avalanche Rated
- 175°C Operating Temperature
- Ease of Paralleling
- Fast Switching for High Efficiency
- Simple Drive Requirements

Mechanical Data

Case: JEDEC TO-220AB molded plastic body

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

High temperature soldering guaranteed: 250°C/10 seconds, 0.17" (4.3mm) from case

Mounting Torque: 10 in-lbs maximum

Weight: 2.0g

Maximum Ratings and Thermal Characteristics ($T_C = 25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	55	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current $V_{GS} = 10\text{V}$	I_D	$T_C = 25^\circ\text{C}$	49
		$T_C = 100^\circ\text{C}$	35
Pulsed Drain Current ⁽¹⁾	I_{DM}	160	A
Maximum Power Dissipation	P_D	94	W
Single Pulse Avalanche Energy ⁽²⁾	E_{AS}	210	mJ
Avalanche Current ⁽¹⁾	I_{AR}	25	A
Repetitive Avalanche Energy ⁽¹⁾	E_{AR}	11	mJ
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55 to 175	$^\circ\text{C}$
Junction-to-Case Thermal Resistance	$R_{\theta JC}$	1.6	$^\circ\text{C/W}$
Junction-to-Ambient Thermal Resistance	$R_{\theta JA}$	62	

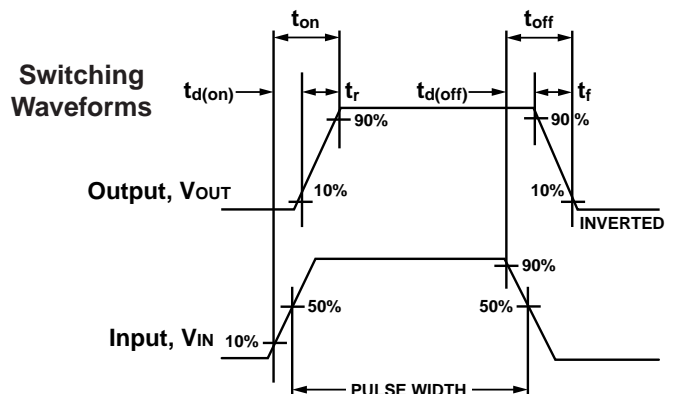
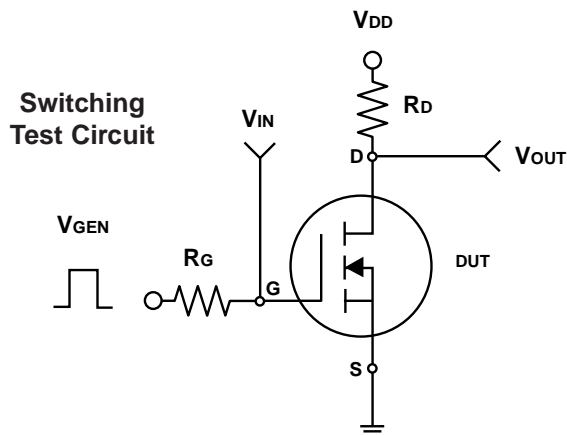
Notes: (1) Repetitive rating; pulse width limited by max. junction temperature
(2) $V_{DD} = 25\text{V}$, starting $T_J = 25^\circ\text{C}$, $L = 470\mu\text{H}$, $R_G = 25\Omega$, $I_{AS} = 25\text{A}$

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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	V _{(BR)DSS}	V _{GS} = 0V, I _D = 250μA	55	–	–	V
Drain-Source On-State Resistance ⁽¹⁾	R _{DS(on)}	V _{GS} = 10V, I _D = 25A	–	16	20	mΩ
		V _{GS} = 6V, I _D = 23A	–	18	22	
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250μA	2.0	–	4.0	V
Forward Transconductance ⁽¹⁾	g _{fs}	V _{DS} = 25V, I _D = 25A	17	78	–	S
Drain-Source Leakage Current	I _{DSS}	V _{DS} = 55V, V _{GS} = 0V	–	–	25	μA
Gate-Source Leakage	I _{GSS}	V _{GS} = ±20V, V _{DS} = 0V	–	–	±100	nA
Dynamic						
Total Gate Charge ⁽¹⁾	Q _g	V _{DS} = 44V, I _D = 25A, V _{GS} = 5V	–	29	40	nC
		V _{DS} = 44V, V _{GS} = 10V I _D = 25A	–	60	65	
Gate-Source Charge ⁽¹⁾	Q _{gs}	V _{DS} = 44V, V _{GS} = 10V I _D = 25A	–	11	–	nC
Gate-Drain (“Miller”) Charge ⁽¹⁾	Q _{gd}		–	13	–	
Turn-On Delay Time ⁽¹⁾	t _{d(on)}	V _{DD} = 28V I _D = 25A, R _G = 12Ω R _D = 1.1Ω, V _{GEN} = 10V	–	19	34	ns
Rise Time ⁽¹⁾	t _r		–	185	240	
Turn-Off Delay Time ⁽¹⁾	t _{d(off)}		–	85	119	
Fall Time ⁽¹⁾	t _f		–	165	210	
Input Capacitance	C _{iss}	V _{GS} = 0V	–	3223	–	pF
Output Capacitance	C _{oss}	V _{DS} = 25V	–	308	–	
Reverse Transfer Capacitance	C _{rss}	f = 1.0MHz	–	135	–	
Source-Drain Diode						
Continuous Source Current	I _S	–	–	–	49	A
Pulsed Source Current ⁽²⁾	I _{SM}	–	–	–	160	
Diode Forward Voltage ⁽¹⁾	V _{SD}	I _S = 25A, V _{GS} = 0V	–	0.93	1.3	V
Source-Drain Reverse Recovery Time ⁽¹⁾	t _{rr}	I _F = 25A, di/dt = 100A/μs	–	53	–	ns
Source-Drain Reverse Recovery Charge ⁽¹⁾	Q _{rr}		–	93	–	nC

Notes: (1) Pulse width ≤ 300μs; duty cycle ≤ 2%
 (2) Repetitive rating; pulse width limited by max. junction temperature



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Ratings and Characteristic Curves

Fig. 1 - Output Characteristics

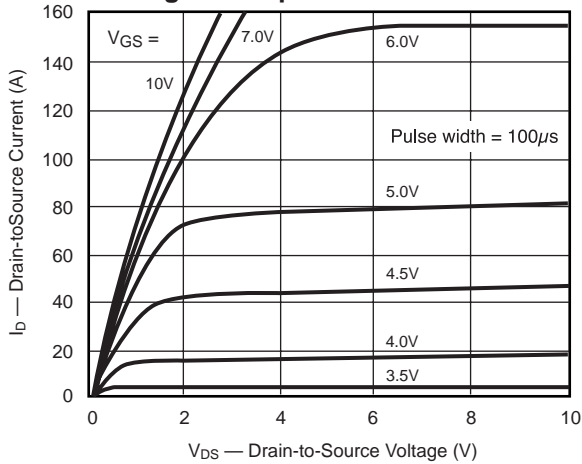


Fig. 2 - Transfer Characteristics

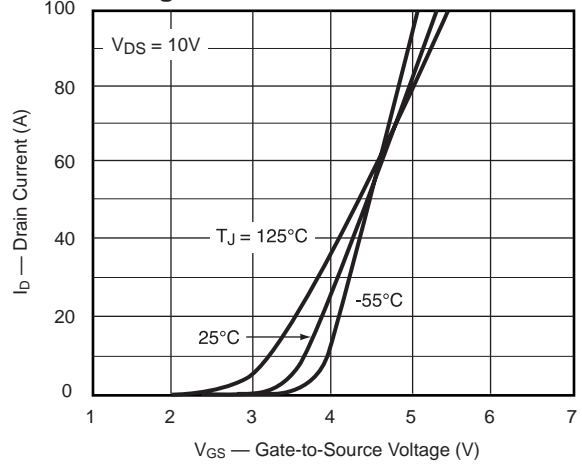


Fig. 3 - On Resistance vs. Drain Current

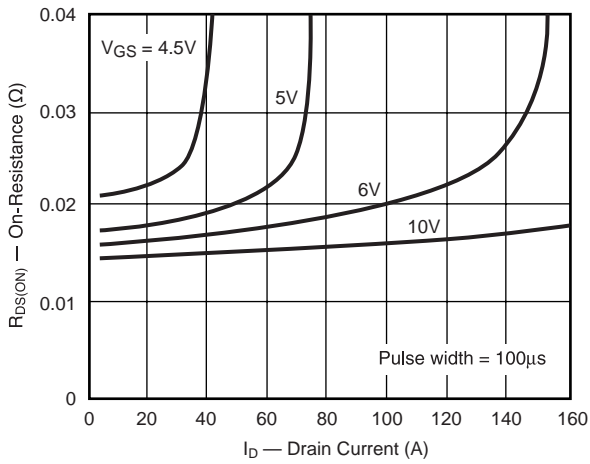


Fig. 4 - Capacitance

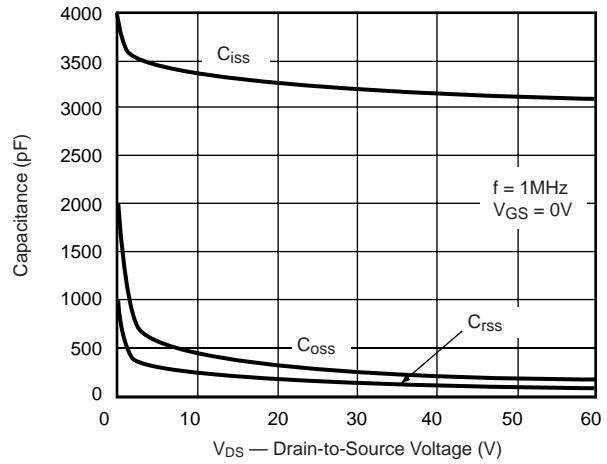
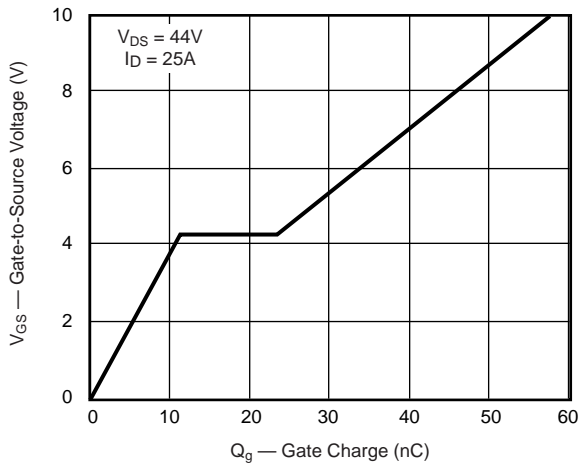


Fig. 5 - Gate Charge



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Ratings and Characteristic Curves

Fig. 6 - Source-Drain Diode Forward Voltage

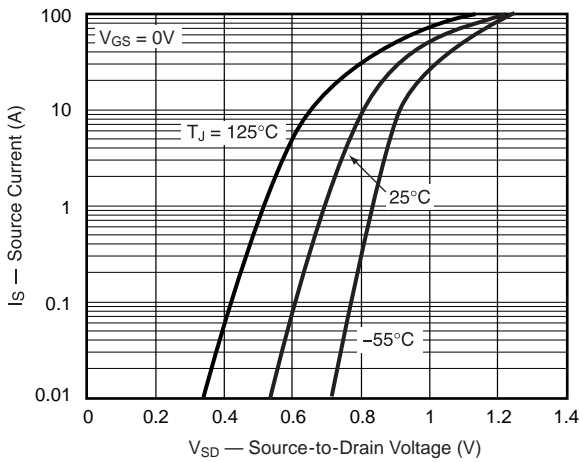


Fig. 7 - On-Resistance vs. Gate-to-Source Voltage

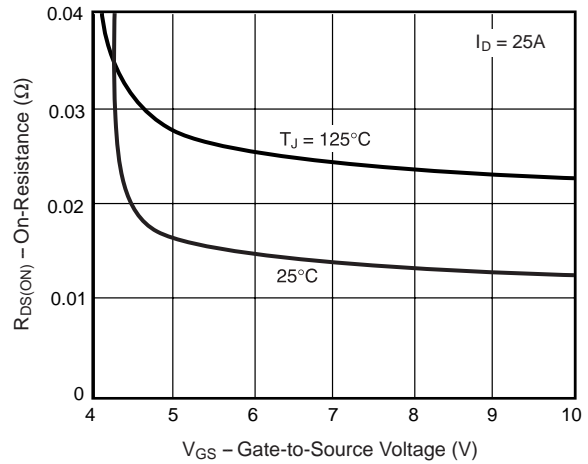


Fig. 8 - Breakdown Voltage vs. Junction Temperature

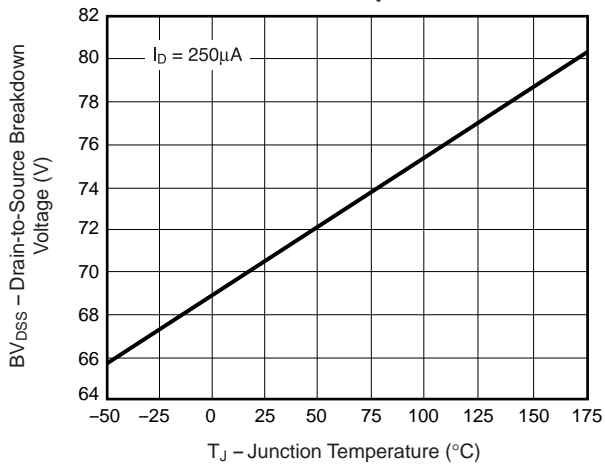
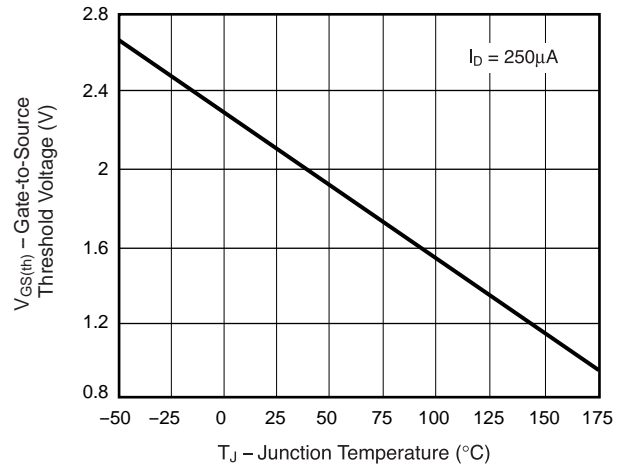


Fig. 9 - Threshold Voltage



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Ratings and Characteristic Curves

Fig. 10 – On-Resistance vs. Junction Temperature

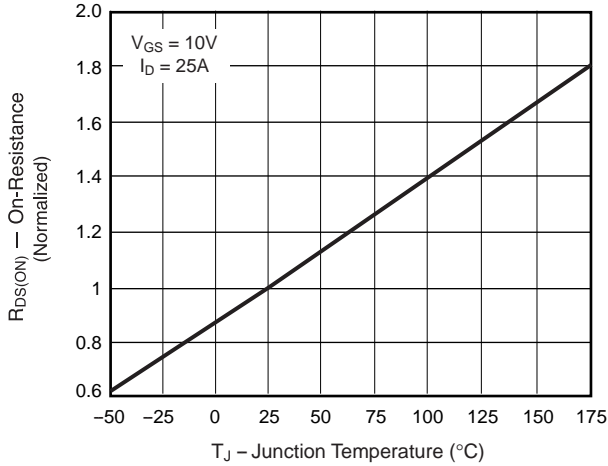


Fig. 11 – Thermal Impedance

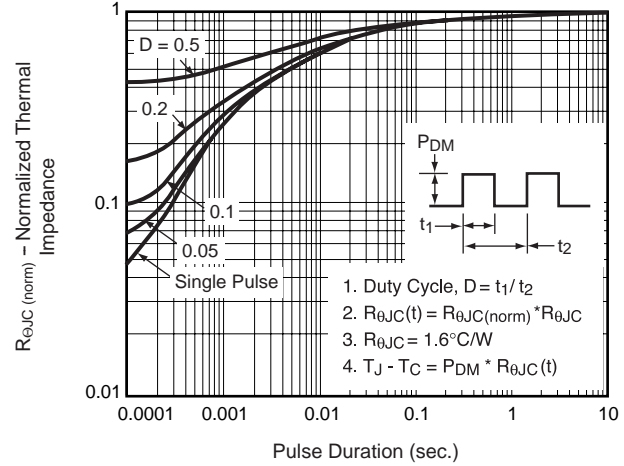


Fig. 12 – Power vs. Pulse Duration

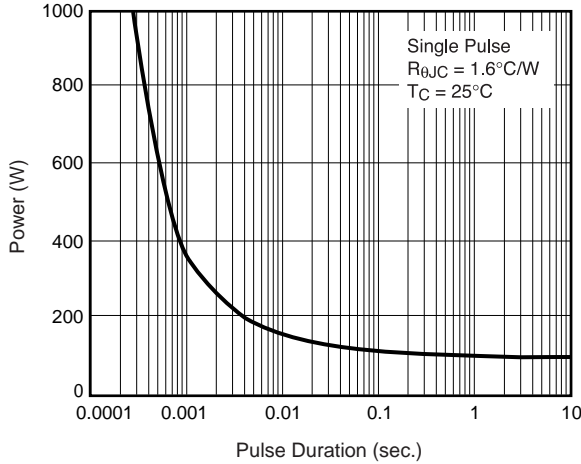


Fig. 13 – Maximum Safe Operating Area

