

N-Channel 120 V (D-S) 175 °C MOSFET

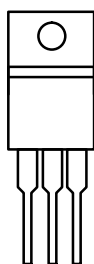
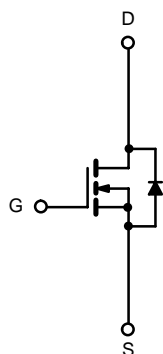
PRODUCT SUMMARY

V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A)
120	0.0022 at $V_{GS} = 10$ V	260 ^a

FEATURES

- TrenchFET[®] Power MOSFET
- New Package with Low Thermal Resistance
- 100 % R_g Tested


RoHS
 COMPLIANT

TO-220AB

 G D S
 Top View


N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS $T_C = 25$ °C, unless otherwise noted

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	120	V
Gate-Source Voltage	V_{GS}	± 20	
Continuous Drain Current ($T_J = 175$ °C)	I_D	260 ^a	A
		228 ^a	
Pulsed Drain Current	I_{DM}	860	
Avalanche Current	I_{AR}	210	mJ
Repetitive Avalanche Energy ^b	E_{AR}	2900	
Maximum Power Dissipation ^b	P_D	418 ^c	W
		6.17	
Operating Junction and Storage Temperature Range	T_J, T_{stg}	- 55 to 175	°C

THERMAL RESISTANCE RATINGS

Parameter	Symbol	Limit	Unit
Junction-to-Ambient	R_{thJA}	35	°C/W
Junction-to-Case (Drain)	R_{thJC}	0.3	

Notes:

a. Package limited.

 b. Duty cycle ≤ 1 %.

c. See SOA curve for voltage derating.

d. When mounted on 1" square PCB (FR-4 material).

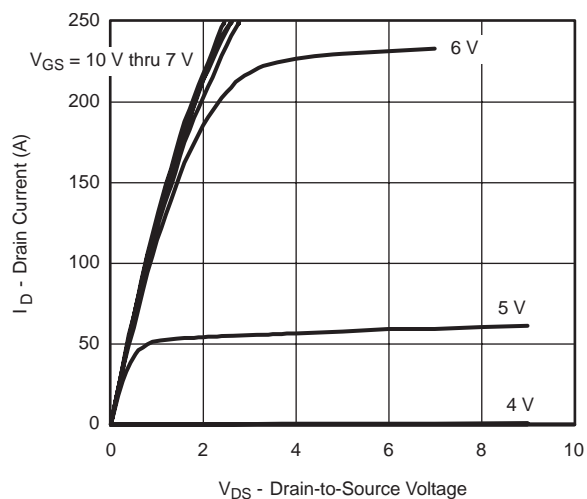
SPECIFICATIONS $T_J = 25\text{ }^{\circ}\text{C}$, unless otherwise noted						
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V_{DS}	$V_{DS} = 0\text{ V}, I_D = 250\text{ }\mu\text{A}$	120			V
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$	2		4	
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 100\text{ V}, V_{GS} = 0\text{ V}$			1	μA
		$V_{DS} = 100\text{ V}, V_{GS} = 0\text{ V}, T_J = 125\text{ }^{\circ}\text{C}$			50	
		$V_{DS} = 100\text{ V}, V_{GS} = 0\text{ V}, T_J = 175\text{ }^{\circ}\text{C}$			250	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} \geq 5\text{ V}, V_{GS} = 10\text{ V}$	260			A
Drain-Source On-State Resistance ^a	$R_{DS(on)}$	$V_{GS} = 10\text{ V}, I_D = 20\text{ A}$		0.0022	0.0026	Ω
		$V_{GS} = 10\text{ V}, I_D = 15\text{ A}, T_J = 125\text{ }^{\circ}\text{C}$			0.0045	
		$V_{GS} = 10\text{ V}, I_D = 15\text{ A}, T_J = 175\text{ }^{\circ}\text{C}$			0.0062	
Forward Transconductance ^a	g_{fs}	$V_{DS} = 15\text{ V}, I_D = 20\text{ A}$	65			S
Dynamic ^b						
Input Capacitance	C_{iss}	$V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$		8050		pF
Output Capacitance	C_{oss}			1130		
Reverse Transfer Capacitance	C_{rss}			238		
Total Gate Charge ^c	Q_g	$V_{DS} = 50\text{ V}, V_{GS} = 10\text{ V}, I_D = 15\text{ A}$		105	150	nC
Gate-Source Charge ^c	Q_{gs}			45		
Gate-Drain Charge ^c	Q_{gd}			24		
Gate Resistance	R_g		1.0		6.3	Ω
Turn-On Delay Time ^c	$t_{d(on)}$	$V_{DD} = 50\text{ V}, R_L = 0.6\text{ }\Omega$ $I_D \cong 15\text{ A}, V_{GEN} = 10\text{ V}, R_g = 2.5\text{ }\Omega$		20	33	ns
Rise Time ^c	t_r			115	180	
Turn-Off Delay Time ^c	$t_{d(off)}$			53	85	
Fall Time ^c	t_f			17	33	
Source-Drain Diode Ratings and Characteristics $T_C = 25\text{ }^{\circ}\text{C}$ ^b						
Continuous Current	I_S				260	A
Pulsed Current	I_{SM}				860	
Forward Voltage ^a	V_{SD}	$I_F = 85\text{ A}, V_{GS} = 0\text{ V}$		1.0	1.5	V
Reverse Recovery Time	t_{rr}	$I_F = 50\text{ A}, dI/dt = 100\text{ A}/\mu\text{s}$		75	153	ns
Peak Reverse Recovery Charge	$I_{RM(REC)}$			5.5	10	A
Reverse Recovery Charge	Q_{rr}			0.15	0.33	μC

Notes:

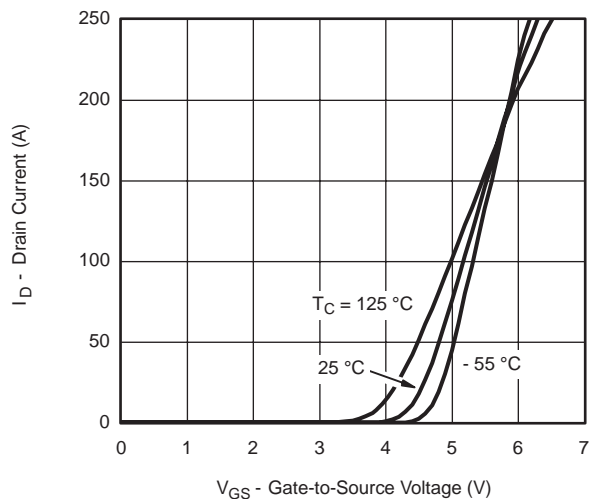
- Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.
- Guaranteed by design, not subject to production testing.
- Independent of operating temperature.

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

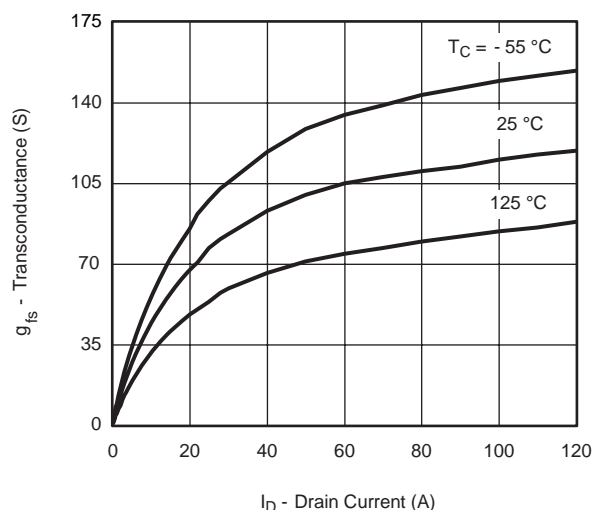
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



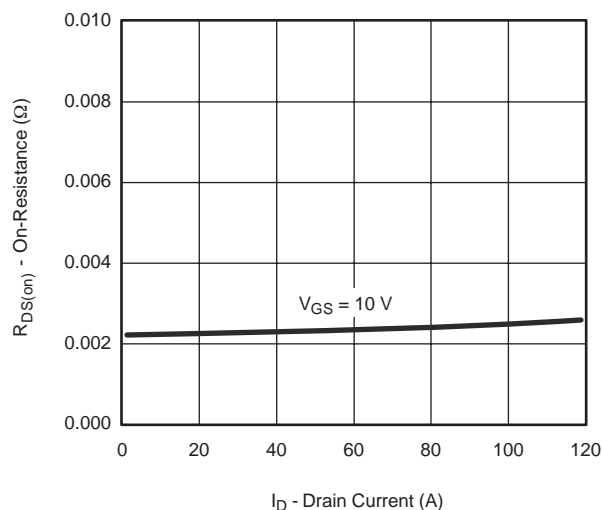
Output Characteristics



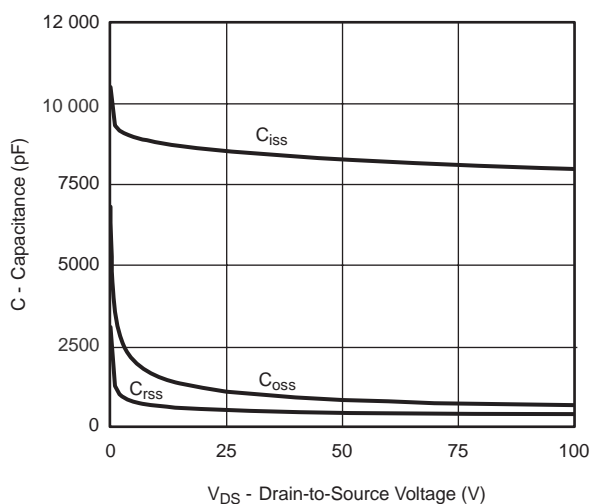
Transfer Characteristics



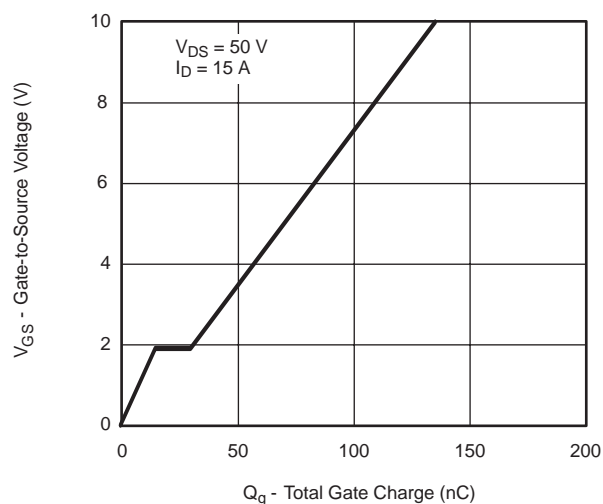
Transconductance



On-Resistance vs. Drain Current

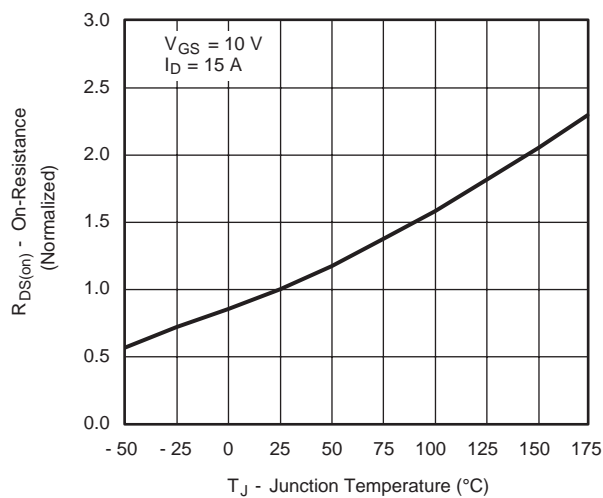


Capacitance

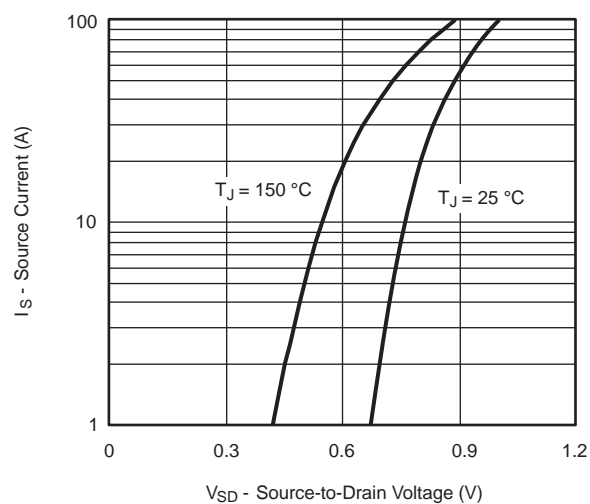


Gate Charge

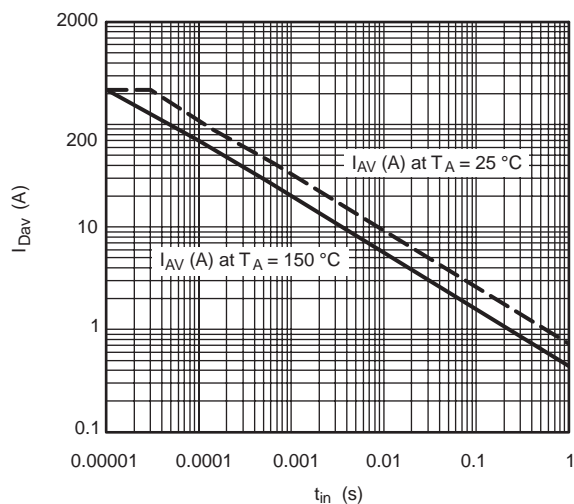
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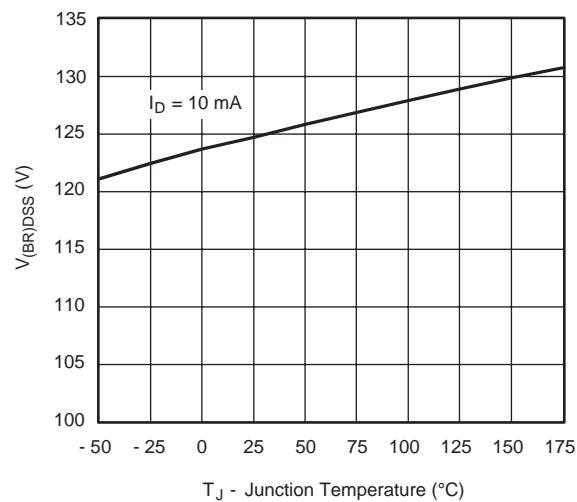
On-Resistance vs. Junction Temperature



Source-Drain Diode Forward Voltage

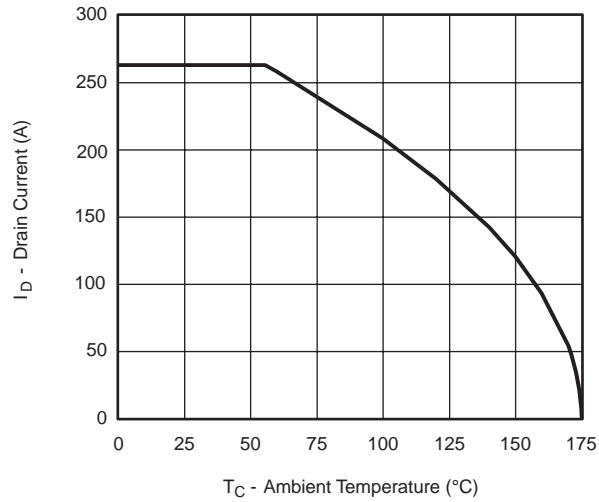


Avalanche Current vs. Time

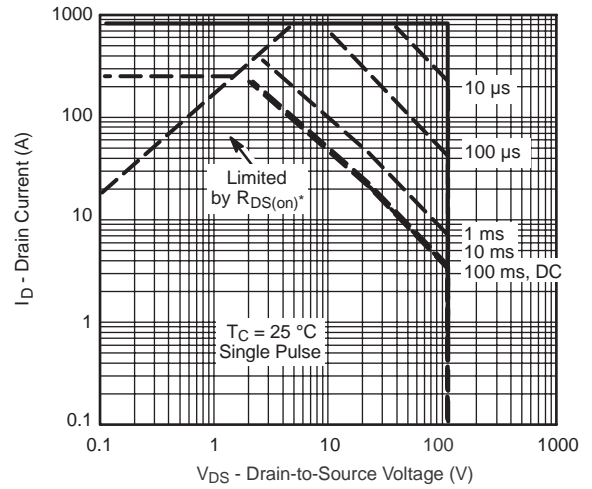


Drain Source Breakdown vs. Junction Temperature

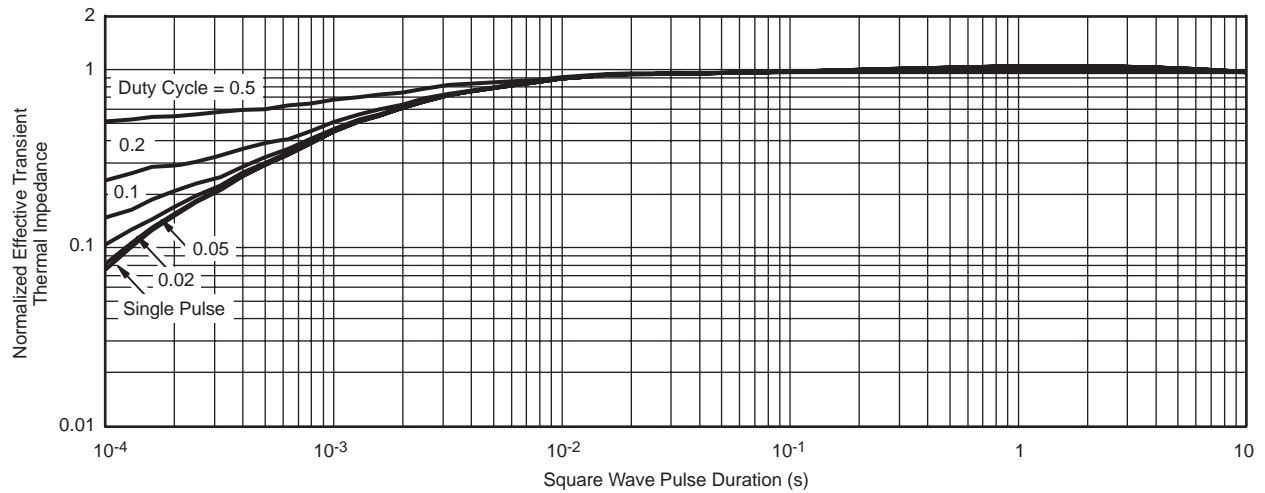
THERMAL RATINGS



**Maximum Avalanche and Drain Current
vs. Case Temperature**



Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Case

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