

N-Channel 100-V (D-S) MOSFET

PRODUCT SUMMARY

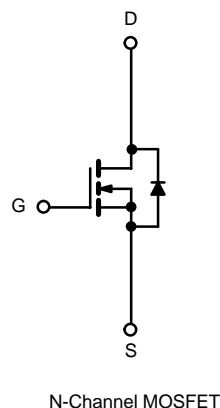
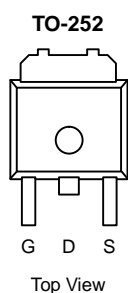
$V_{(BR)DSS}$ (V)	$r_{DS(on)}$ (Ω)	I_D (A)
100	0.033 at $V_{GS} = 10$ V	40
	0.043 at $V_{GS} = 4.5$ V	37.5

FEATURES

- DT-Trench Power MOSFET
- 175 °C Junction Temperature
- Low Thermal Resistance Package



Available

RoHS*
 COMPLIANT


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

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	± 20	
Continuous Drain Current ($T_J = 175$ °C)	I_D	40	A
		23	
Pulsed Drain Current	I_{DM}	122	
Avalanche Current	I_{AR}	37	mJ
Repetitive Avalanche Energy ^a	E_{AR}	66	
Maximum Power Dissipation ^a	P_D	109 ^b	W
		3.92	
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}	40	°C/W
Junction-to-Case (Drain)	R_{thJC}	1.3	

Notes:

 a. Duty cycle ≤ 1 %.

b. See SOA curve for voltage derating.

c. When Mounted on 1" square PCB (FR-4 material).

* Pb containing terminations are not RoHS compliant, exemptions may apply.

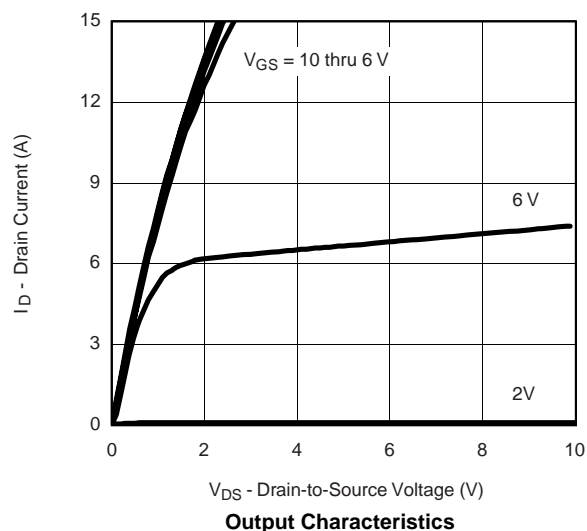
SPECIFICATIONS $T_J = 25\text{ }^{\circ}\text{C}$, unless otherwise noted						
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{SS} = 0\text{ V}$, $I_D = 250\text{ }\mu\text{A}$	100			V
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 250\text{ }\mu\text{A}$	0.8		1.8	
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
		$V_{DS} = 80\text{ V}$, $V_{GS} = 0\text{ V}$, $T_J = 125\text{ }^{\circ}\text{C}$			50	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} \geq 5\text{ V}$, $V_{GS} = 10\text{ V}$	40			A
Drain-Source On-State Resistance ^a	$r_{DS(on)}$	$V_{GS} = 10\text{ V}$, $I_D = 5\text{ A}$		0.033	0.040	Ω
		$V_{GS} = 4.5\text{ V}$, $I_D = 3\text{ A}$		0.043	0.055	
Forward Transconductance ^a	g_{fs}	$V_{DS} = 15\text{ V}$, $I_D = 15\text{ A}$	20			S
Dynamic ^b						
Input Capacitance	C_{iss}	$V_{GS} = 0\text{ V}$, $V_{DS} = 50\text{ V}$, $f = 1\text{ MHz}$		855		pF
Output Capacitance	C_{oss}			106		
Reverse Transfer Capacitance	C_{rss}			52		
Total Gate Charge ^c	Q_g	$V_{DS} = 50\text{ V}$, $V_{GS} = 10\text{ V}$, $I_D = 5\text{ A}$		28	40	nC
Gate-Source Charge ^c	Q_{gs}			11		
Gate-Drain Charge ^c	Q_{gd}			9		
Gate Resistance	R_G			1.7		Ω
Turn-On Delay Time ^c	$t_{d(on)}$	$V_{DD} = 50\text{ V}$, $R_L = 2.5\text{ }\Omega$ $I_D \cong 5\text{ A}$, $V_{GEN} = 10\text{ V}$, $R_G = 2.5\text{ }\Omega$		17		ns
Rise Time ^c	t_r			12		
Turn-Off Delay Time ^c	$t_{d(off)}$			30		
Fall Time ^c	t_f			12		
Source-Drain Diode Ratings and Characteristics $T_C = 25\text{ }^{\circ}\text{C}$ ^b						
Continuous Current	I_S				40	A
Pulsed Current	I_{SM}				125	
Forward Voltage ^a	V_{SD}	$I_F = 5\text{ A}$, $V_{GS} = 0\text{ V}$		1.0	1.5	V
Reverse Recovery Time	t_{rr}	$I_F = 5\text{ A}$, $di/dt = 100\text{ A}/\mu\text{s}$		67		ns
Peak Reverse Recovery Current	$I_{RM(REC)}$			5		A
Reverse Recovery Charge	Q_{rr}			35		nC

Notes:

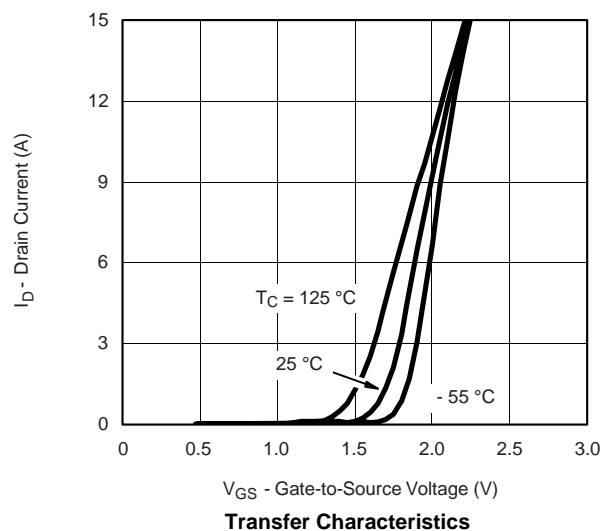
- Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$
- Guaranteed by design, not subject to production testing.
- Independent of operating temperature.

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.

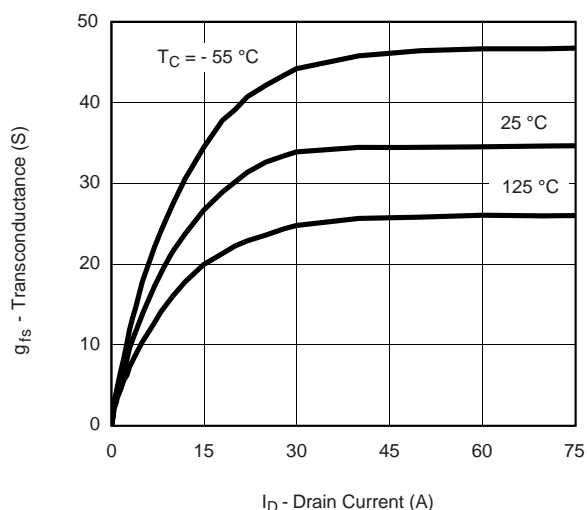
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



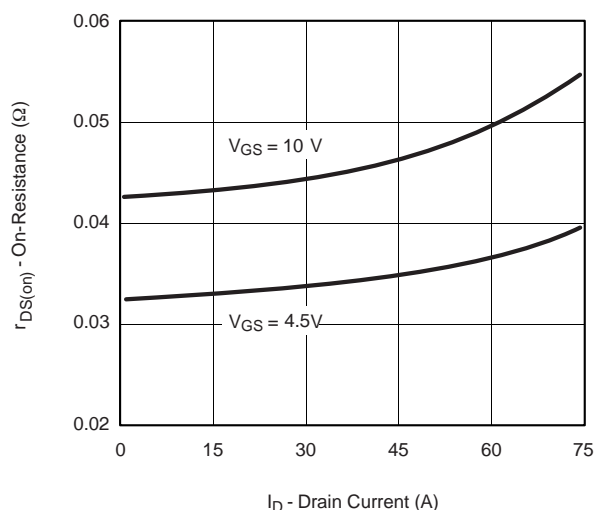
Output Characteristics



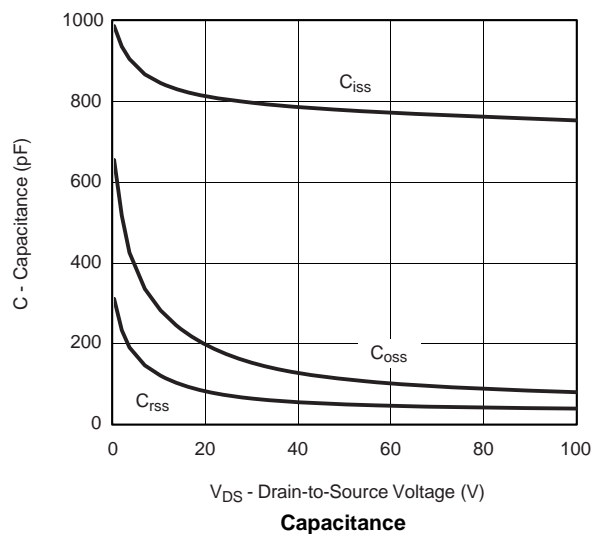
Transfer Characteristics



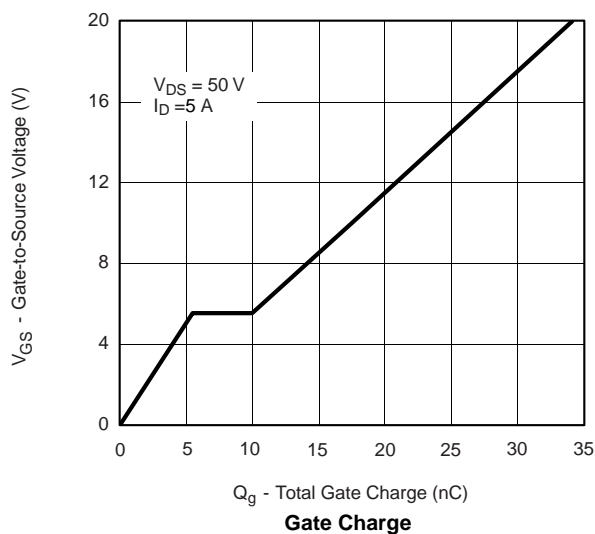
Transconductance



On-Resistance vs. Drain Current

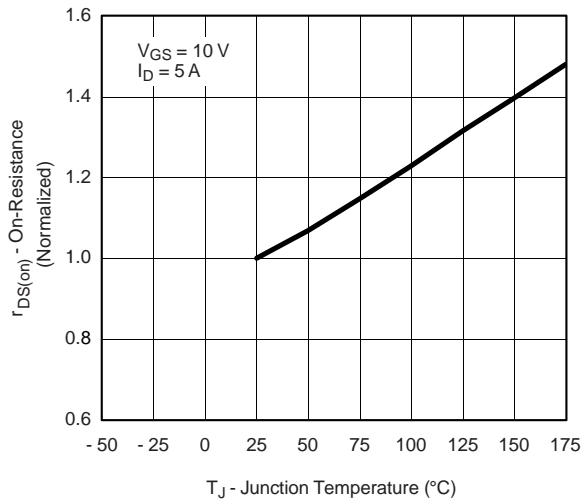


Capacitance

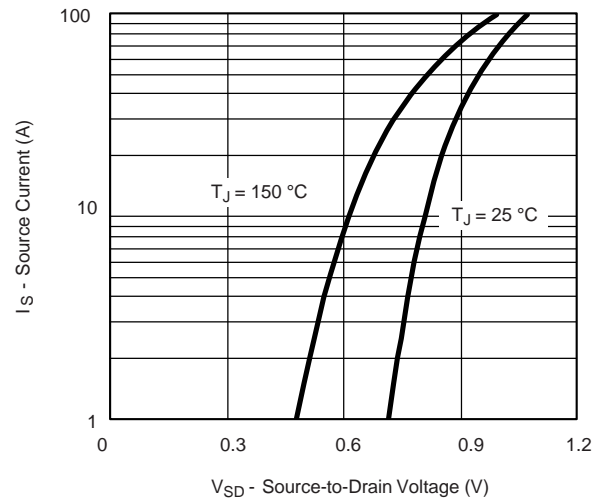


Gate Charge

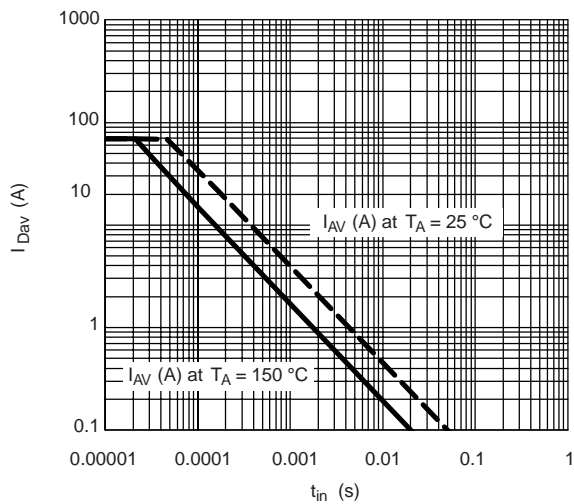
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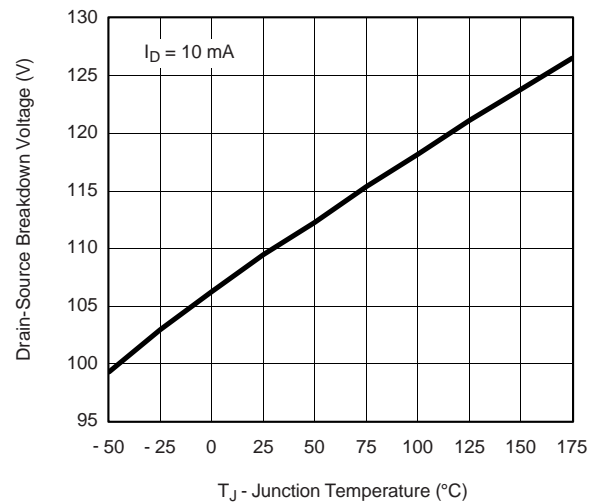
On-Resistance vs. Junction Temperature



Source-Drain Diode Forward Voltage

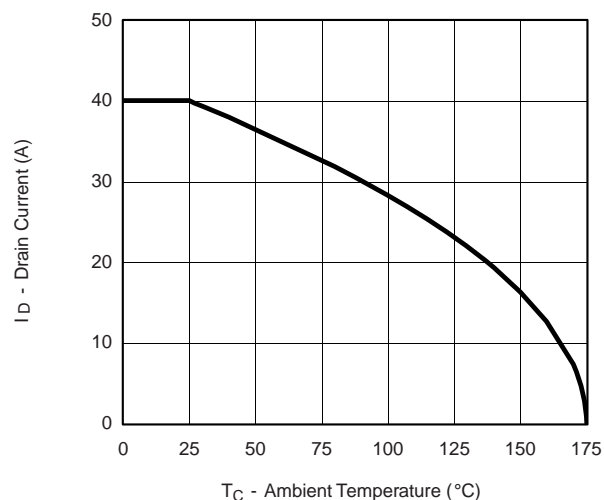


Avalanche Current vs. Time

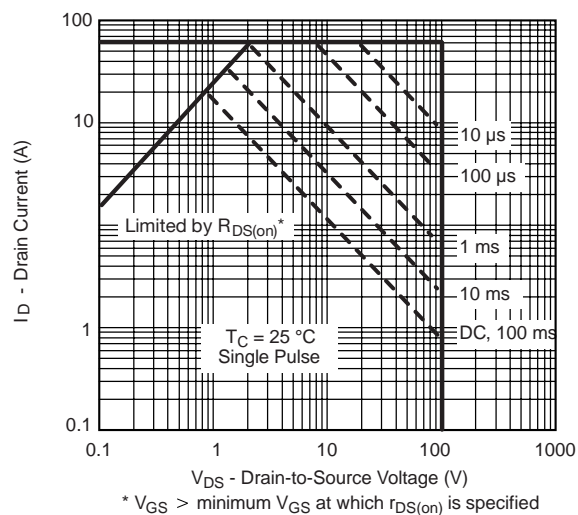


Drain-Source Breakdown Voltage vs. Junction Temperature

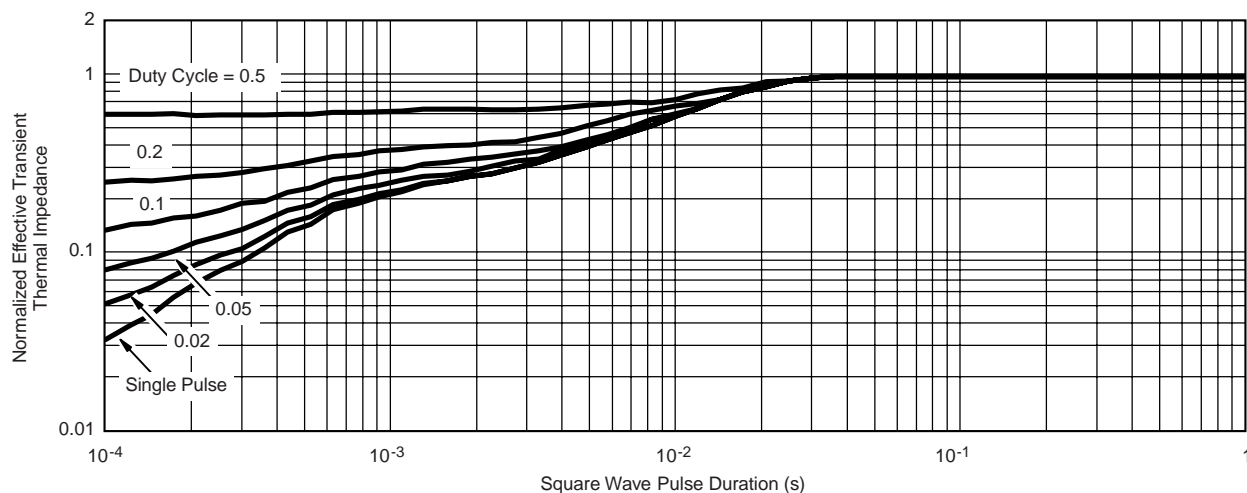
THERMAL RATINGS



Maximum Avalanche and Drain Current vs. Case Temperature



Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Case

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