N-Channel 75-V (D-S) MOSFET

PRODUCT SUMMARY		
$V_{(BR)DSS}$ (V)	$r_{DS(on)}$ (Ω)	I_D (A)
75	0.007 @ V_{GS} = 10 V	110

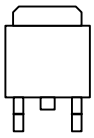
FEATURES

- TrenchFET® Power MOSFET
- New Low Thermal Resistance Package

APPLICATIONS

- Automotive
  - Boardnet 42-V EPS and ABS
  - Motor Drives
- High Current
- DC/DC Converters

TO-263



Top View

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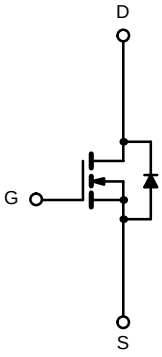


N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS (T_C = 25°C UNLESS OTHERWISE NOTED)				
Parameter		**Symbol**	**Limit**	**Unit**
Drain-Source Voltage		V_{DS}	75	V
Gate-Source Voltage		V_{GS}	±20	
Continuous Drain Current (T_J = 175°C)	T_C = 25°C	I_D	110	A
	T_C = 125°C		63	
Pulsed Drain Current		I_{DM}	350	
Avalanche Current		I_{AR}	75	
Repetitive Avalanche Energy[a]	L = 0.1 mH	E_{AR}	280	mJ
Maximum Power Dissipation[a]	T_C = 25°C	P_D	200[b]	W
	T_A = 25°C[d]		3.7	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55 to 175	°C

THERMAL RESISTANCE RATINGS				
Parameter		**Symbol**	**Limit**	**Unit**
Junction-to-Ambient	PCB Mount[c]	R_{thJA}	40	°C/W
Junction-to-Case		R_{thJC}	0.75	

Notes
a. Duty cycle ≤ 1%.
b. See SOA curve for voltage derating.
c. When mounted on 1" square PCB (FR-4 material).

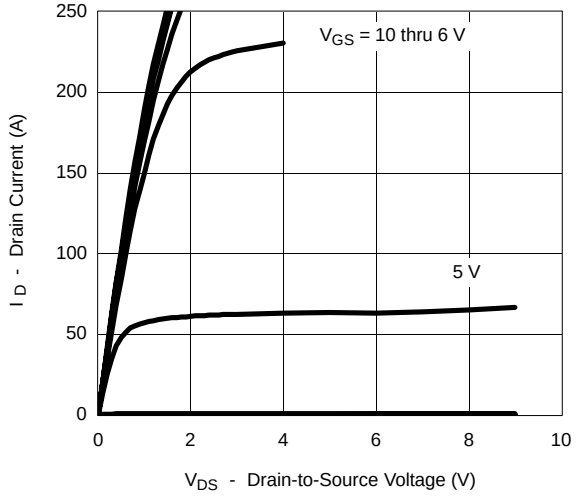
SPECIFICATIONS (T_J =25°C UNLESS OTHERWISE NOTED)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{DS} = 0 V, I_D = 250 μA	75			V
Gate-Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 μA	2.5		4.0	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±20 V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 60 V, V_{GS} = 0 V			1	μA
		V_{DS} = 60 V, V_{GS} = 0 V, T_J = 125°C			50	
		V_{DS} = 60 V, V_{GS} = 0 V, T_J = 175°C			250	
On-State Drain Current[a]	$I_{D(on)}$	V_{DS} ≥ 5 V, V_{GS} = 10 V	120			A
Drain-Source On-State Resistance[a]	$r_{DS(on)}$	V_{GS} = 10 V, I_D = 30 A		0.0055	0.007	Ω
		V_{GS} = 10 V, I_D = 30 A, T_J = 125°C			0.013	
		V_{GS} = 10 V, I_D = 30 A, T_J = 175°C			0.017	
Forward Transconductance[a]	g_{fs}	V_{DS} = 15 V, I_D = 30 A	30			S
Dynamic[b]						
Input Capacitance	C_{iss}	V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz		5250		pF
Output Capacitance	C_{oss}			700		
Reverse Transfer Capacitance	C_{rss}			310		
Total Gate Charge[c]	Q_g	V_{DS} = 35 V, V_{GS} = 10 V, I_D = 110 A		90	165	nC
Gate-Source Charge[c]	Q_{gs}			24		
Gate-Drain Charge[c]	Q_{gd}			27		
Turn-On Delay Time[c]	$t_{d(on)}$	V_{DD} = 35 V, R_L = 0.4 Ω I_D ≅ 85 A, V_{GEN} = 10 V, R_G = 2.5 Ω		20	30	ns
Rise Time[c]	t_r			100	150	
Turn-Off Delay Time[c]	$t_{d(off)}$			45	70	
Fall Time[c]	t_f			75	115	
Source-Drain Diode Ratings and Characteristics (T_C = 25°C)[b]						
Continuous Current	I_S				110	A
Pulsed Current	I_{SM}				350	
Forward Voltage[a]	V_{SD}	I_F = 110 A, V_{GS} = 0 V		1.0	1.5	V
Reverse Recovery Time	t_{rr}	I_F = 85 A, di/dt = 100 A/μs		75	120	ns
Peak Reverse Recovery Current	$I_{RM(REC)}$			3.5	7	A
Reverse Recovery Charge	Q_{rr}			0.13	0.30	μC

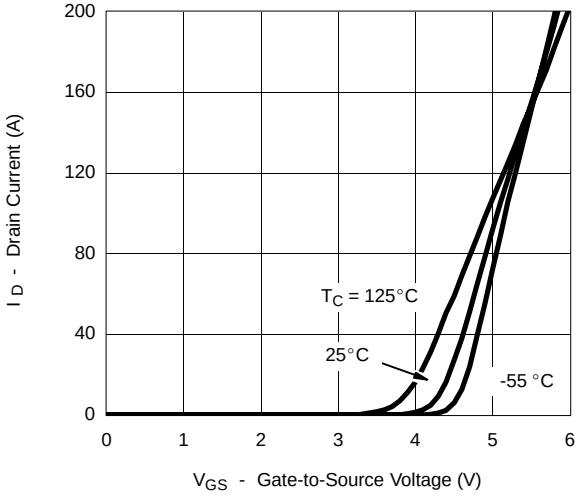
Notes
a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.
b. Guaranteed by design, not subject to production testing.
c. Independent of operating temperature.

TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

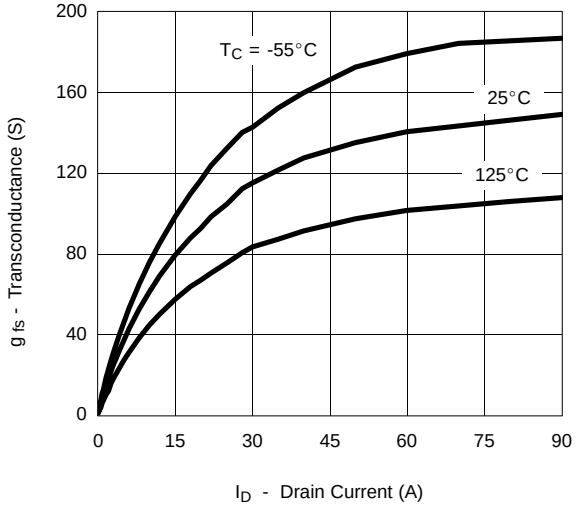
Output Characteristics



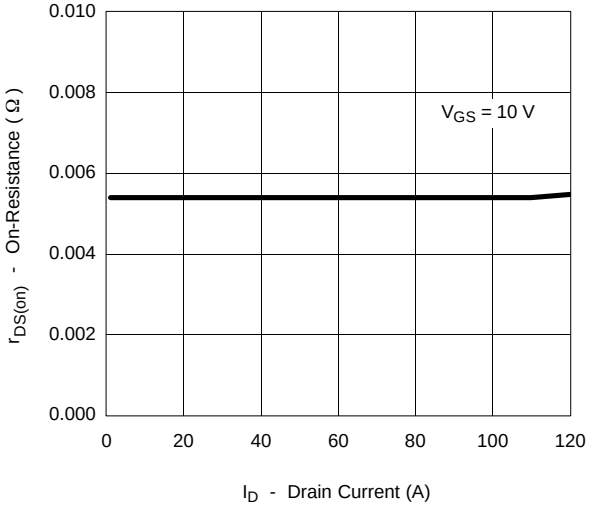
Transfer Characteristics



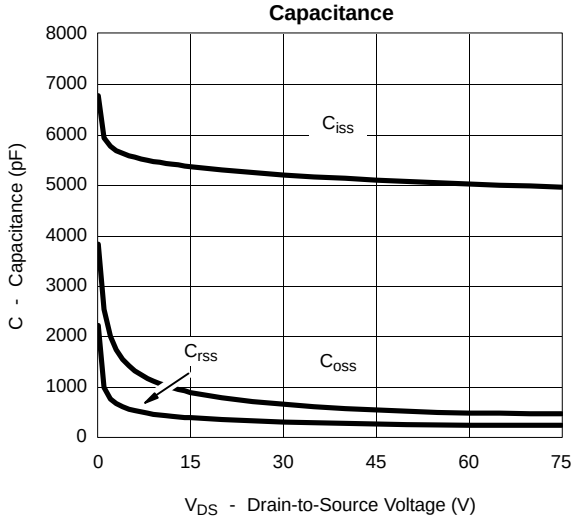
Transconductance



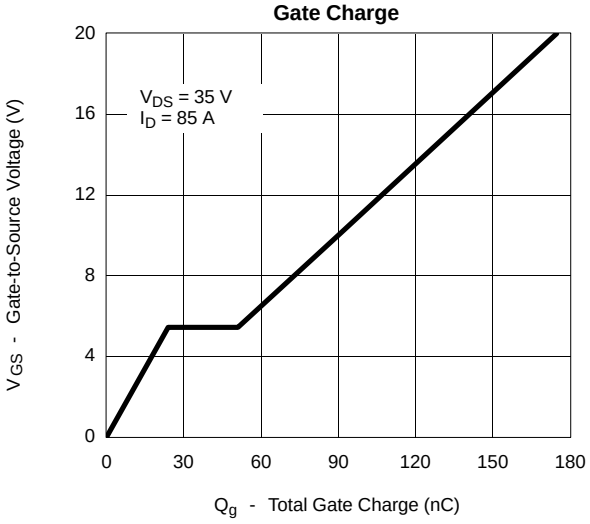
On-Resistance vs. Drain Current



Capacitance

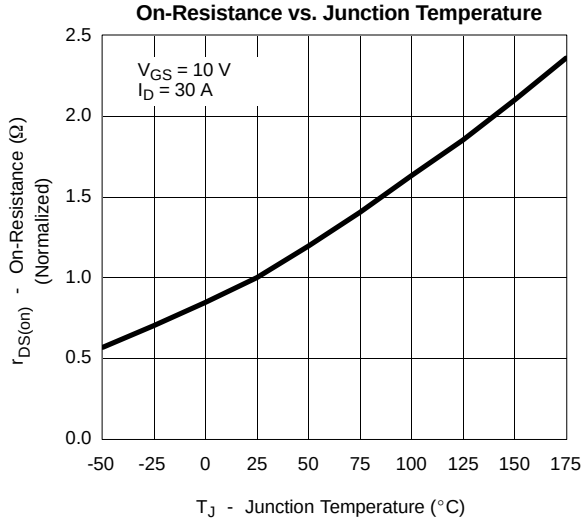


Gate Charge

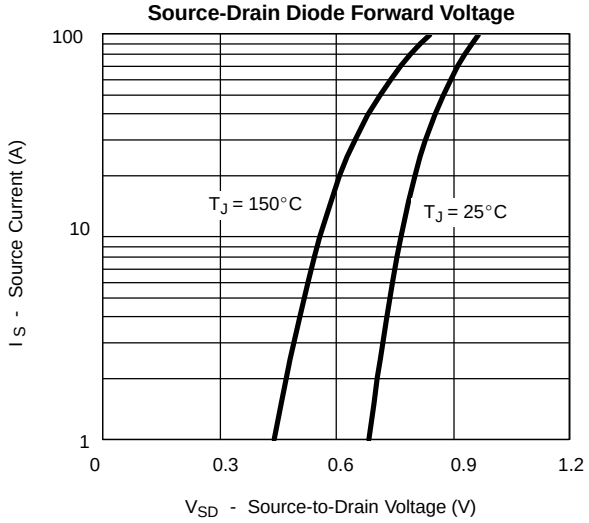


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

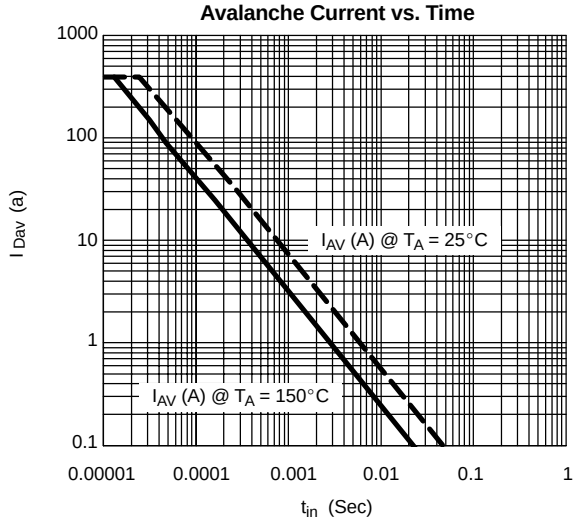
On-Resistance vs. Junction Temperature



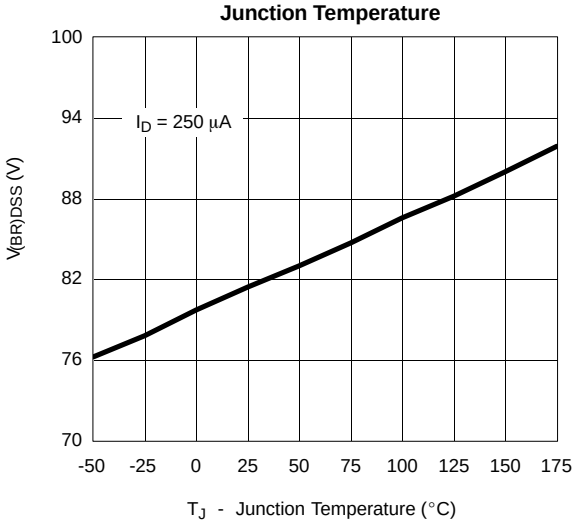
Source-Drain Diode Forward Voltage



Avalanche Current vs. Time

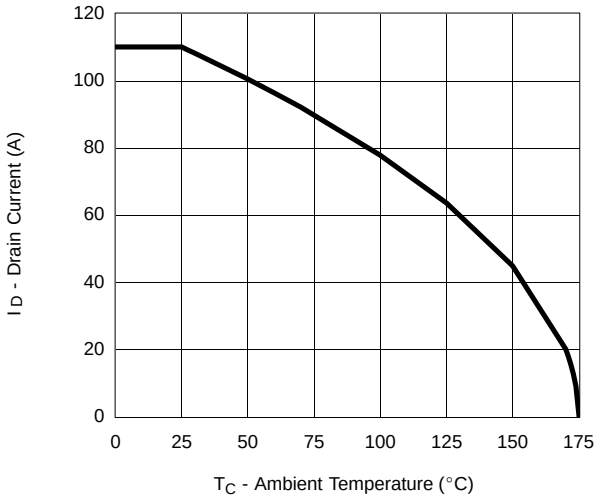


Drain Source Breakdown vs. Junction Temperature

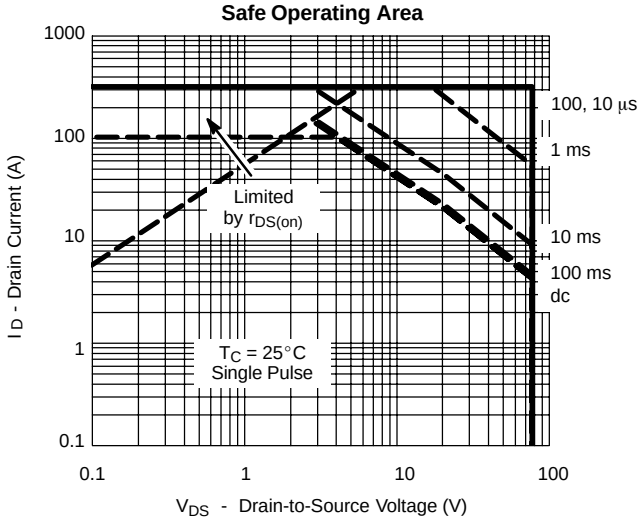


THERMAL RATINGS

Maximum Avalanche and Drain Current vs. Case Temperature



Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Case

