N-Channel 150-V (D-S) 175°C MOSFET

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PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
150	0.095 @ V_{GS} = 10 V	18
	0.100 @ V_{GS} = 6 V	17.5

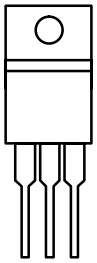
FEATURES

- TrenchFET® Power MOSFETS
- 175°C Junction Temperature

APPLICATIONS

- 42-V Automotive Bus

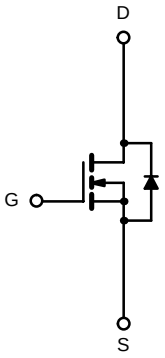
TO-220AB



Top View

SUP18N15-95

DRAIN connected to TAB



N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS (T_C = 25°C UNLESS OTHERWISE NOTED)				
Parameter		**Symbol**	**Limit**	**Unit**
Drain-Source Voltage		V_{DS}	150	V
Gate-Source Voltage		V_{GS}	±20	
Continuous Drain Current (T_J = 175°C)	T_C = 25°C	I_D	18	A
	T_C = 125°C		10.3	
Pulsed Drain Current		I_{DM}	25	
Avalanche Current		I_{AR}	15	
Repetitive Avalanche Energy[a]	L = 0.1 mH	E_{AR}	16.2	mJ
Maximum Power Dissipation[a]	T_C = 25°C	P_D	88[b]	W
Operating Junction and Storage Temperature Range		T_J, T_{stg}	–55 to 175	°C

THERMAL RESISTANCE RATINGS			
Parameter	**Symbol**	**Limit**	**Unit**
Junction-to-Ambient (Free Air)	R_{thJA}	85	°C/W
Junction-to-Case	R_{thJC}	1.7	

Notes
a. Duty cycle ≤ 1%.
b. See SOA curve for voltage derating.

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SPECIFICATIONS (T_J = 25°C UNLESS OTHERWISE NOTED)

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Parameter	Symbol	Test Condition	Min	Typ[a]	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0 V, I_D = 250 μA	150			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 μA	2			
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±20 V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 120 V, V_{GS} = 0 V			1	μA
		V_{DS} = 120 V, V_{GS} = 0 V, T_J = 125°C			50	
		V_{DS} = 120 V, V_{GS} = 0 V, T_J = 175°C			250	
On-State Drain Current[b]	$I_{D(on)}$	V_{DS} = 5 V, V_{GS} = 10 V	25			A
Drain-Source On-State Resistance[b]	$r_{DS(on)}$	V_{GS} = 10 V, I_D = 15 A		0.077	0.095	Ω
		V_{GS} = 10 V, I_D = 15 A, T_J = 125°C			0.190	
		V_{GS} = 10 V, I_D = 15 A, T_J = 175°C			0.250	
		V_{GS} = 6 V, I_D = 10 A		0.081	0.100	
Forward Transconductance[b]	g_{fs}	V_{DS} = 15 V, I_D = 15 A		25		S
Dynamic[a]						
Input Capacitance	C_{iss}	V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz		900		pF
Output Capacitance	C_{oss}			115		
Reverse Transfer Capacitance	C_{rss}			70		
Total Gate Charge[c]	Q_g	V_{DS} = 75 V, V_{GS} = 10 V, I_D = 15 A		20	25	nC
Gate-Source Charge[c]	Q_{gs}			5.5		
Gate-Drain Charge[c]	Q_{gd}			7		
Turn-On Delay Time[c]	$t_{d(on)}$	V_{DD} = 75 V, R_L = 5 Ω I_D ≅ 15 A, V_{GEN} = 10 V, R_G = 2.5 Ω		8	12	ns
Rise Time[c]	t_r			35	55	
Turn-Off Delay Time[c]	$t_{d(off)}$			17	25	
Fall Time[c]	t_f			30	45	
Source-Drain Diode Ratings and Characteristics (T_C = 25°C)[b]						
Continuous Current	I_S				15	A
Pulsed Current	I_{SM}				25	
Forward Voltage[a]	V_{SD}	I_F = 15 A, V_{GS} = 0 V		0.9	1.5	V
Reverse Recovery Time	t_{rr}	I_F = 15 A, di/dt = 100 A/μs		55	85	ns
Peak Reverse Recovery Current	$I_{RM(REC)}$			5	8	A
Reverse Recovery Charge	Q_{rr}			0.13	0.34	μC

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

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TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

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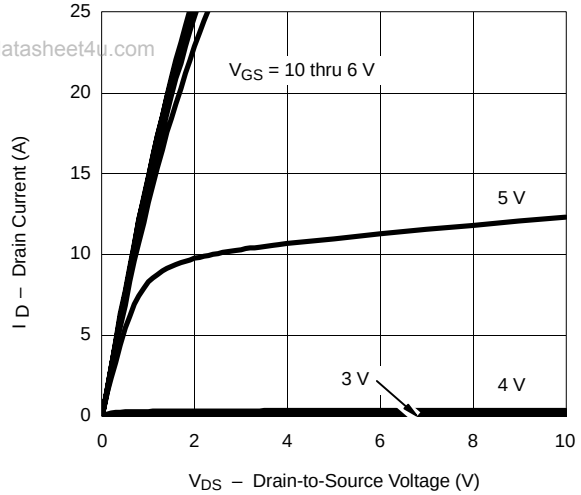
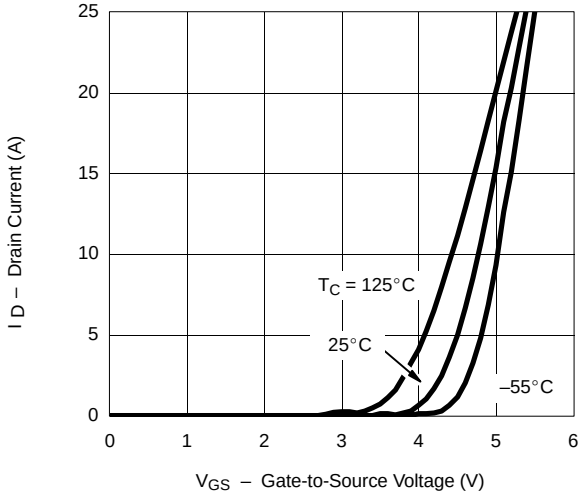
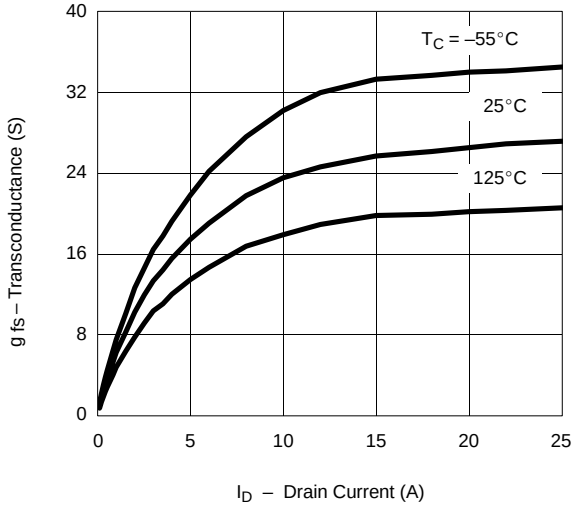
Output Characteristics



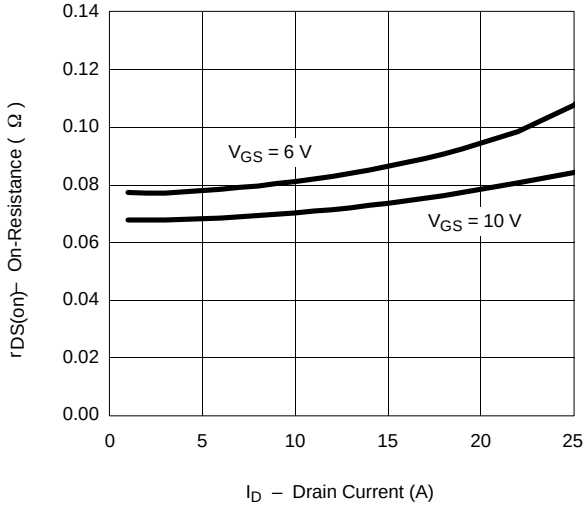
Transfer Characteristics



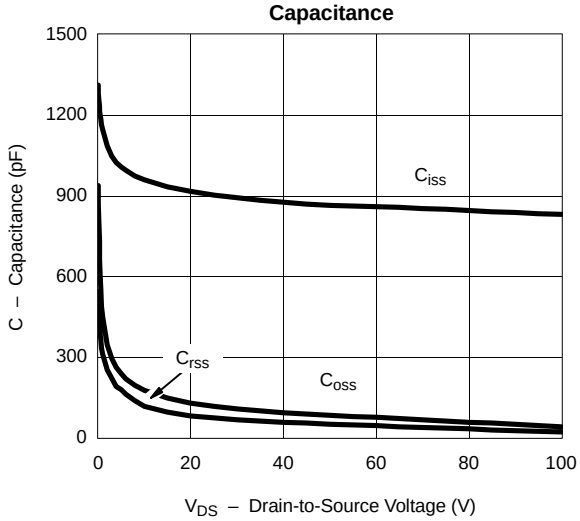
Transconductance



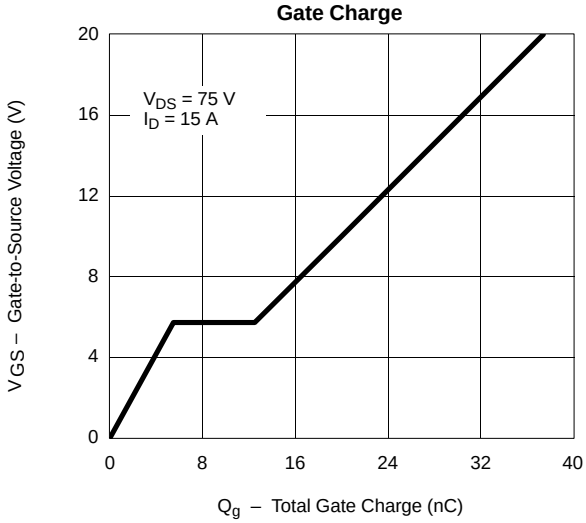
On-Resistance vs. Drain Current



Capacitance



Gate Charge



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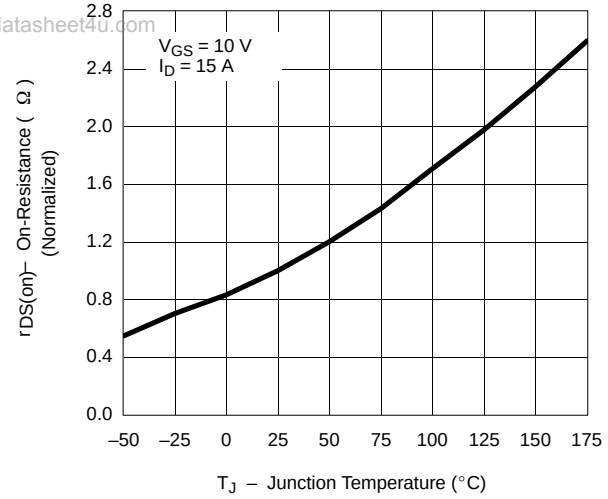
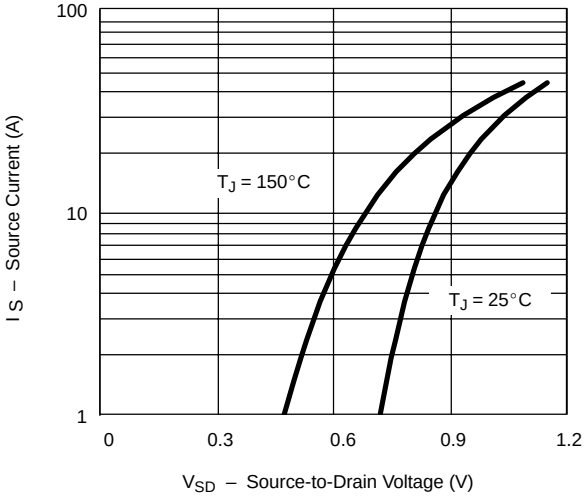
TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

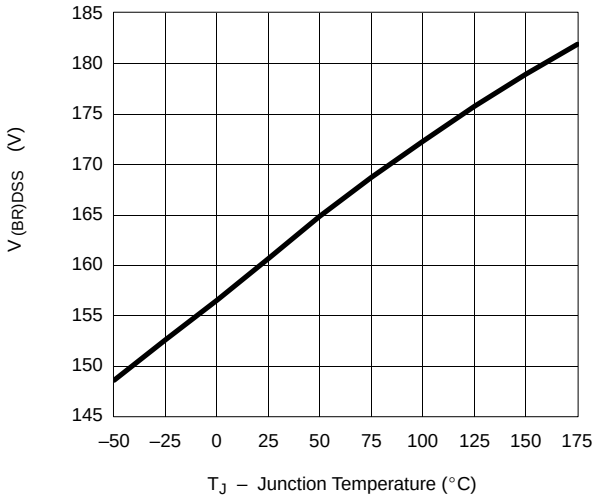
On-Resistance vs. Junction Temperature



Source-Drain Diode Forward Voltage



Drain-Source Voltage Breakdown vs. Junction Temperature



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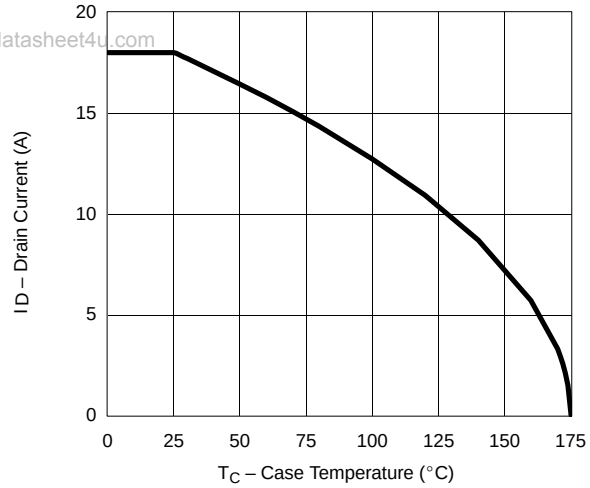
THERMAL RATINGS

Maximum Avalanche Drain Current vs. Case Temperature



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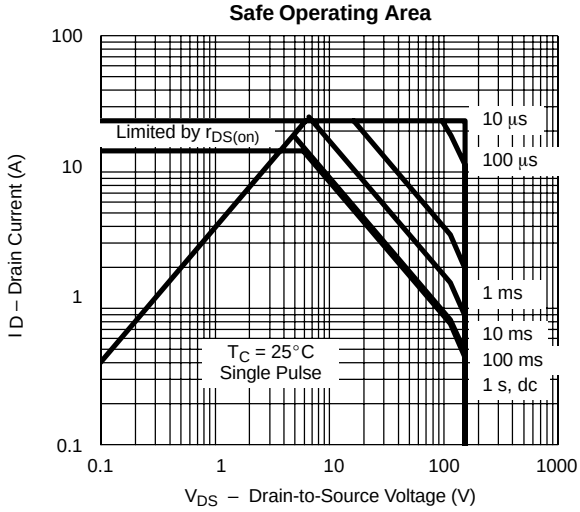
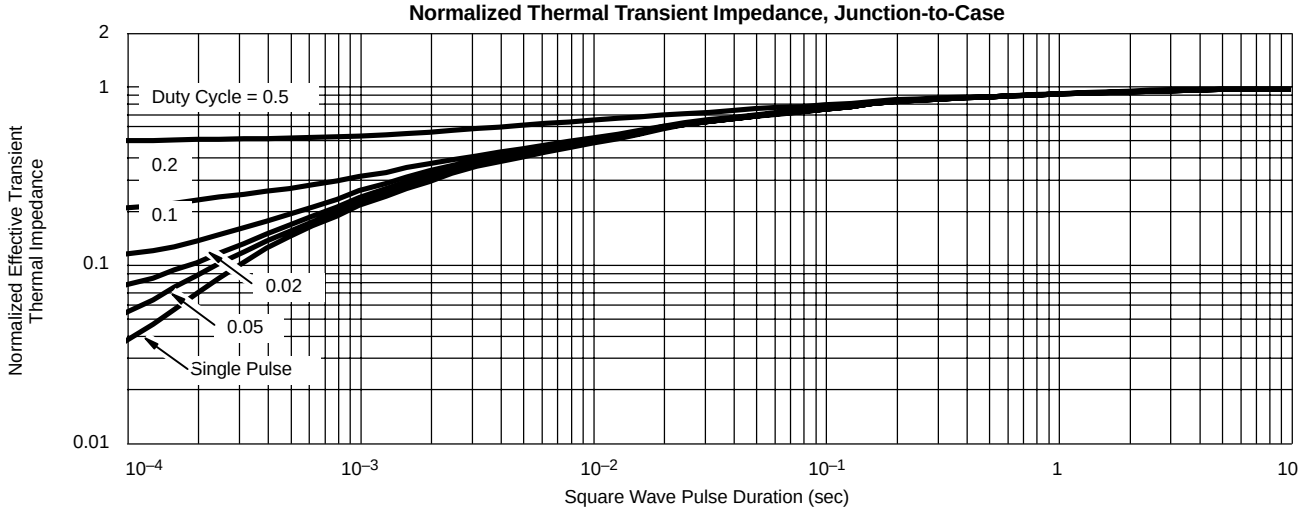
Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Case



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