

N-Channel 150-V (D-S) 175°C MOSFET

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

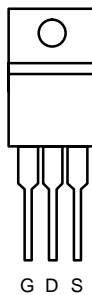
FEATURES

- TrenchFET® Power MOSFETS
- 175°C Junction Temperature

APPLICATIONS

- 42-V Automotive Bus

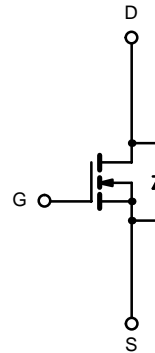
TO-220AB



Top View

SUP18N15-95

DRAIN connected to TAB



N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS ($T_C = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)				
Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	150	V
Gate-Source Voltage		V_{GS}	± 20	
Continuous Drain Current ($T_J = 175^\circ\text{C}$)	$T_C = 25^\circ\text{C}$	I_D	18	A
	$T_C = 125^\circ\text{C}$		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	$T_C = 25^\circ\text{C}$	P_D	88 ^b	W
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55 to 175	$^\circ\text{C}$

THERMAL RESISTANCE RATINGS				
Parameter		Symbol	Limit	Unit
Junction-to-Ambient (Free Air)		R_{thJA}	85	$^\circ\text{C/W}$
Junction-to-Case		R_{thJC}	1.7	

Notes

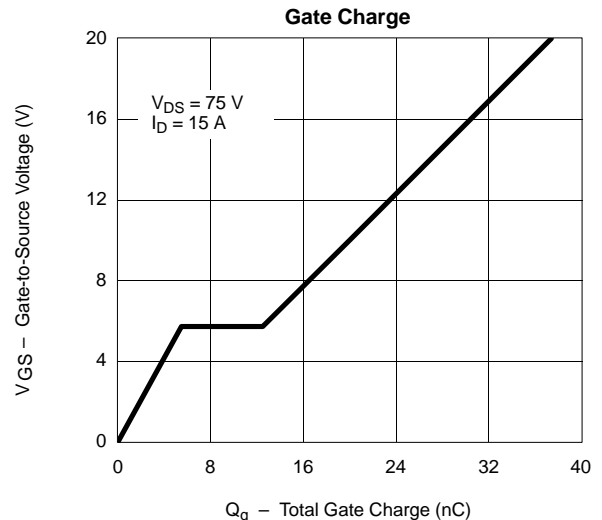
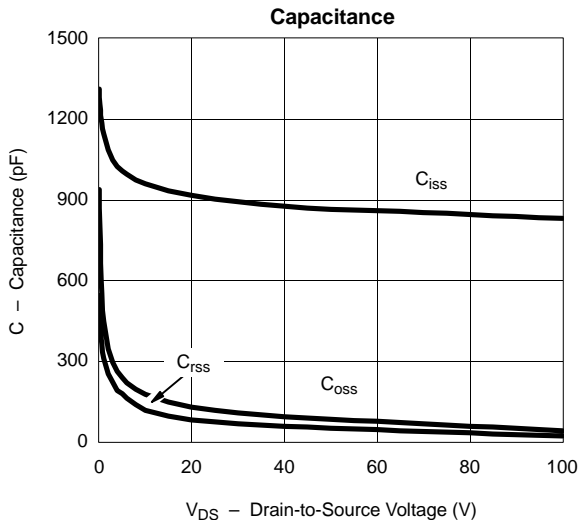
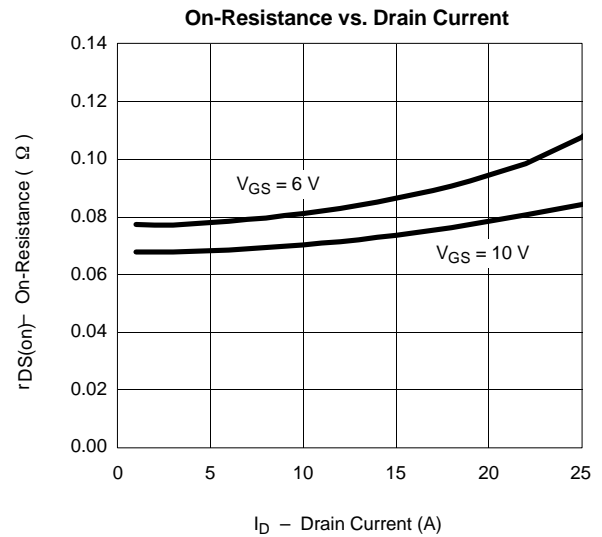
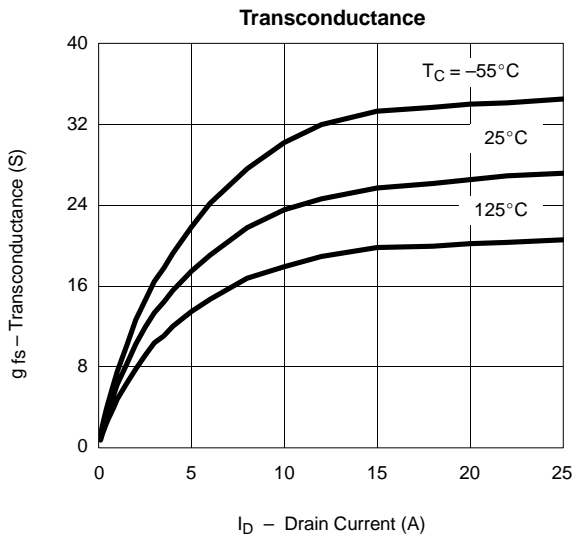
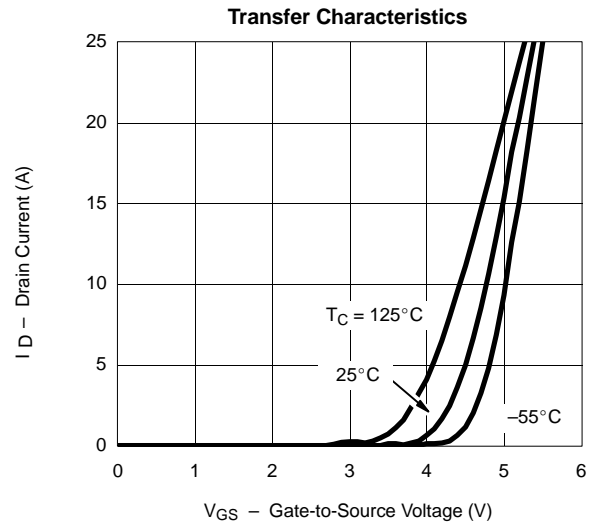
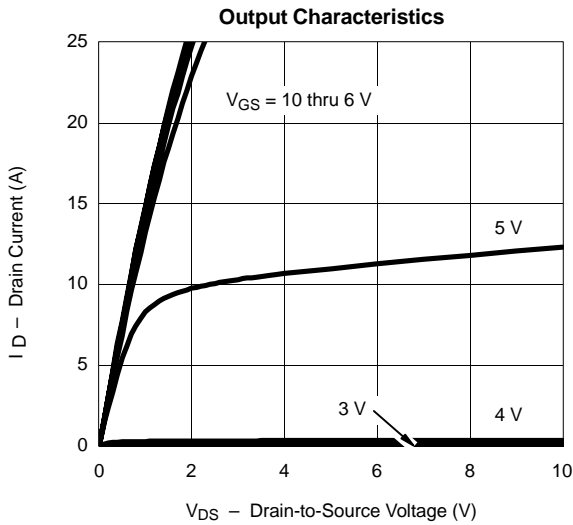
- Duty cycle $\leq 1\%$.
- See SOA curve for voltage derating.

SPECIFICATIONS (T _J = 25 °C UNLESS OTHERWISE NOTED)						
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

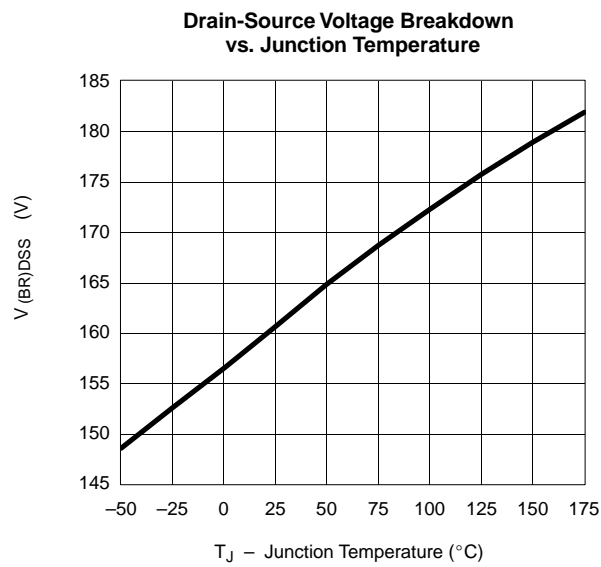
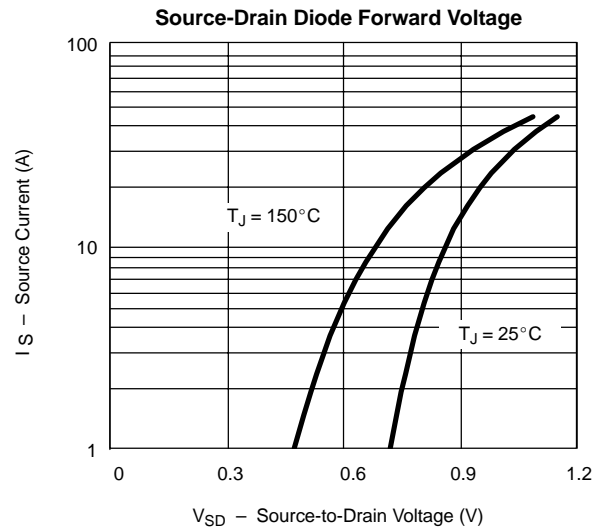
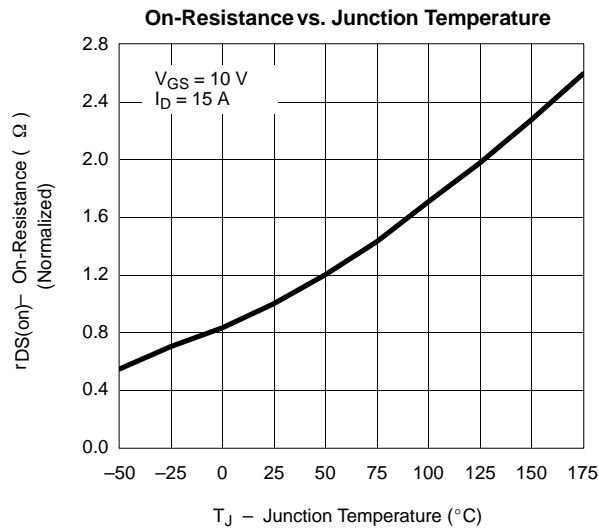
Notes:

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

TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)



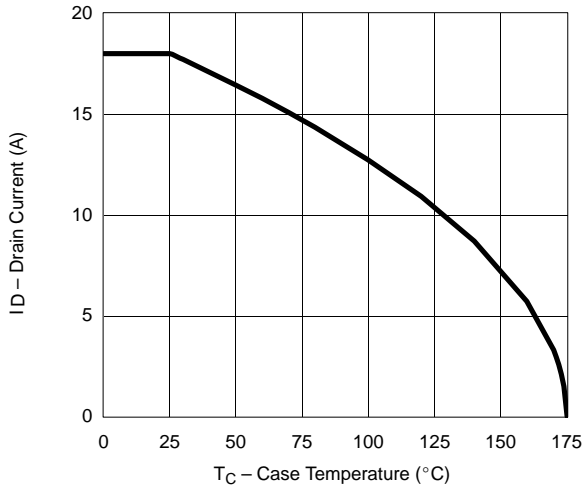
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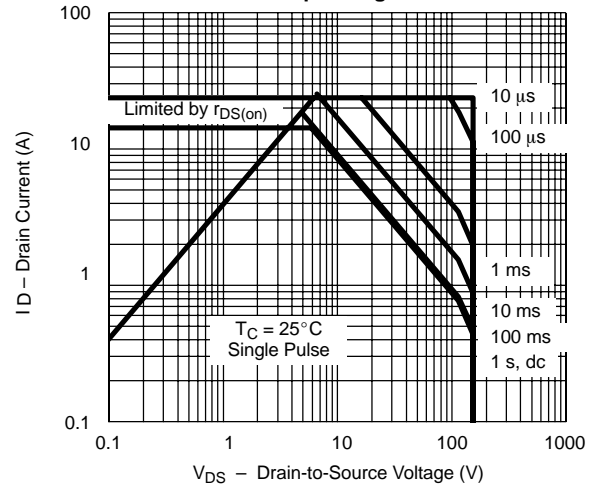


THERMAL RATINGS

Maximum Avalanche Drain Current vs. Case Temperature



Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Case

