



## N-Channel 150-V (D-S) 175°C MOSFET

<b>PRODUCT SUMMARY</b>		
$V_{DS}$ (V)	$r_{DS(on)}$ ( $\Omega$ )	$I_D$ (A)
150	0.095 @ $V_{GS} = 10$ V	18
	0.100 @ $V_{GS} = 6$ V	17.5

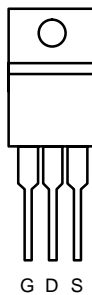
### FEATURES

- TrenchFET® Power MOSFETS
- 175°C Junction Temperature

### APPLICATIONS

- 42-V Automotive Bus

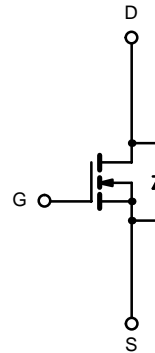
TO-220AB



Top View

SUP18N15-95

DRAIN connected to TAB



N-Channel MOSFET

<b>ABSOLUTE MAXIMUM RATINGS (<math>T_C = 25^\circ\text{C}</math> UNLESS OTHERWISE NOTED)</b>				
Parameter		Symbol	Limit	Unit
Drain-Source Voltage		$V_{DS}$	150	V
Gate-Source Voltage		$V_{GS}$	$\pm 20$	
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 <sup>a</sup>	$L = 0.1$ mH	$E_{AR}$	16.2	mJ
Maximum Power Dissipation <sup>a</sup>	$T_C = 25^\circ\text{C}$	$P_D$	88 <sup>b</sup>	W
Operating Junction and Storage Temperature Range		$T_J, T_{stg}$	-55 to 175	$^\circ\text{C}$

<b>THERMAL RESISTANCE RATINGS</b>				
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.

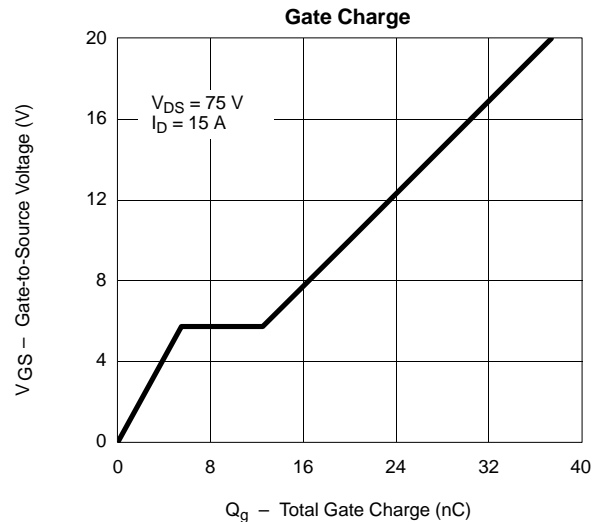
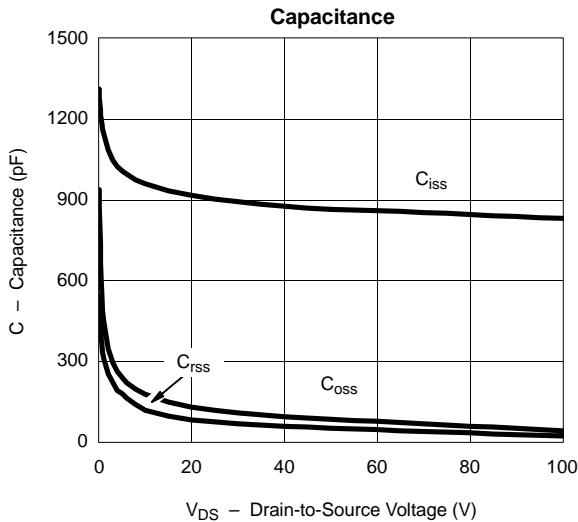
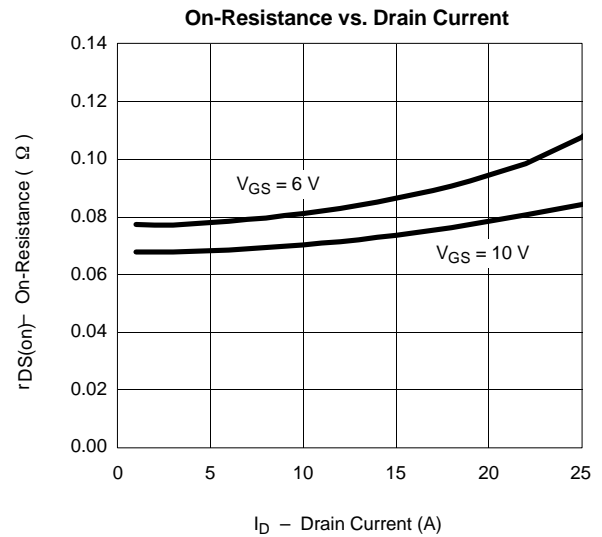
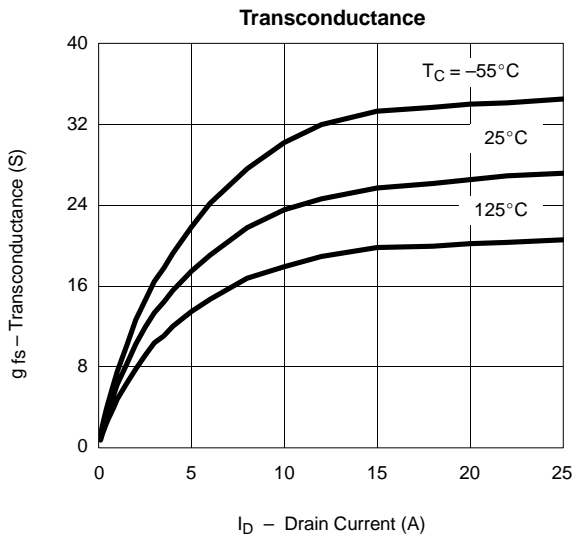
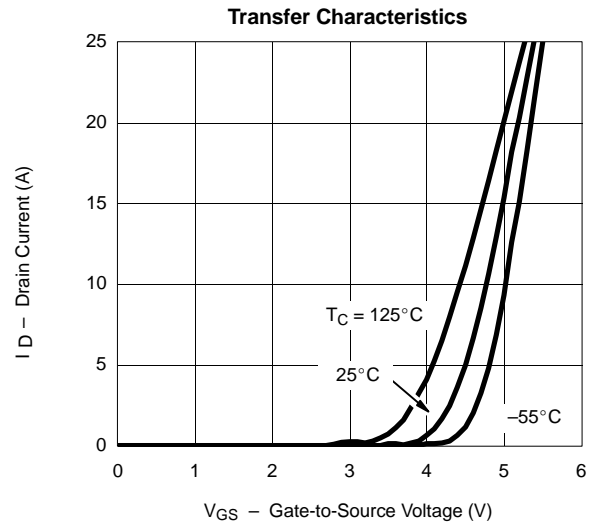
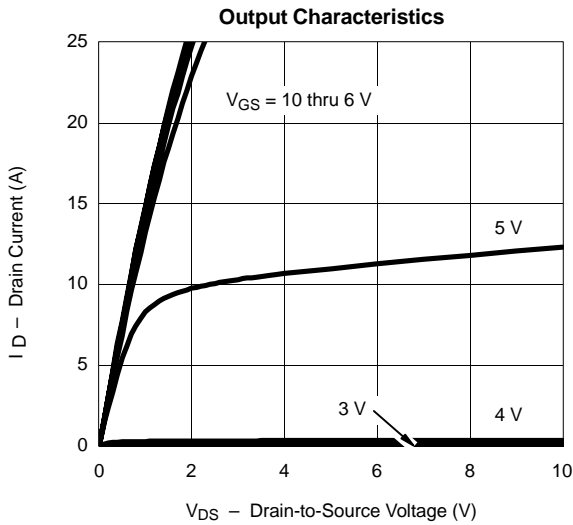
SPECIFICATIONS (T <sub>J</sub> = 25 °C UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Condition	Min	Typ <sup>a</sup>	Max	Unit
<b>Static</b>						
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0 V, I <sub>D</sub> = 250 μA	150			V
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250 μA	2			
Gate-Body Leakage	I <sub>GSS</sub>	V <sub>DS</sub> = 0 V, V <sub>GS</sub> = ± 20 V			± 100	nA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = 120 V, V <sub>GS</sub> = 0 V			1	μA
		V <sub>DS</sub> = 120 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 125 °C			50	
		V <sub>DS</sub> = 120 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 175 °C			250	
On-State Drain Current <sup>b</sup>	I <sub>D(on)</sub>	V <sub>DS</sub> = 5 V, V <sub>GS</sub> = 10 V	25			A
Drain-Source On-State Resistance <sup>b</sup>	r <sub>DS(on)</sub>	V <sub>GS</sub> = 10 V, I <sub>D</sub> = 15 A		0.077	0.095	Ω
		V <sub>GS</sub> = 10 V, I <sub>D</sub> = 15 A, T <sub>J</sub> = 125 °C			0.190	
		V <sub>GS</sub> = 10 V, I <sub>D</sub> = 15 A, T <sub>J</sub> = 175 °C			0.250	
		V <sub>GS</sub> = 6 V, I <sub>D</sub> = 10 A		0.081	0.100	
Forward Transconductance <sup>b</sup>	g <sub>fs</sub>	V <sub>DS</sub> = 15 V, I <sub>D</sub> = 15 A		25		S
<b>Dynamic<sup>a</sup></b>						
Input Capacitance	C <sub>iss</sub>	V <sub>GS</sub> = 0 V, V <sub>DS</sub> = 25 V, f = 1 MHz		900		pF
Output Capacitance	C <sub>oss</sub>			115		
Reverse Transfer Capacitance	C <sub>rss</sub>			70		
Total Gate Charge <sup>c</sup>	Q <sub>g</sub>	V <sub>DS</sub> = 75 V, V <sub>GS</sub> = 10 V, I <sub>D</sub> = 15 A		20	25	nC
Gate-Source Charge <sup>c</sup>	Q <sub>gs</sub>			5.5		
Gate-Drain Charge <sup>c</sup>	Q <sub>gd</sub>			7		
Turn-On Delay Time <sup>c</sup>	t <sub>d(on)</sub>	V <sub>DD</sub> = 75 V, R <sub>L</sub> = 5 Ω I <sub>D</sub> ≅ 15 A, V <sub>GEN</sub> = 10 V, R <sub>G</sub> = 2.5 Ω		8	12	ns
Rise Time <sup>c</sup>	t <sub>r</sub>			35	55	
Turn-Off Delay Time <sup>c</sup>	t <sub>d(off)</sub>			17	25	
Fall Time <sup>c</sup>	t <sub>f</sub>			30	45	
<b>Source-Drain Diode Ratings and Characteristics (T<sub>C</sub> = 25 °C)<sup>b</sup></b>						
Continuous Current	I <sub>S</sub>				15	A
Pulsed Current	I <sub>SM</sub>				25	
Forward Voltage <sup>a</sup>	V <sub>SD</sub>	I <sub>F</sub> = 15 A, V <sub>GS</sub> = 0 V		0.9	1.5	V
Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> = 15 A, di/dt = 100 A/μs		55	85	ns
Peak Reverse Recovery Current	I <sub>RM(REC)</sub>			5	8	A
Reverse Recovery Charge	Q <sub>rr</sub>			0.13	0.34	μC

Notes:

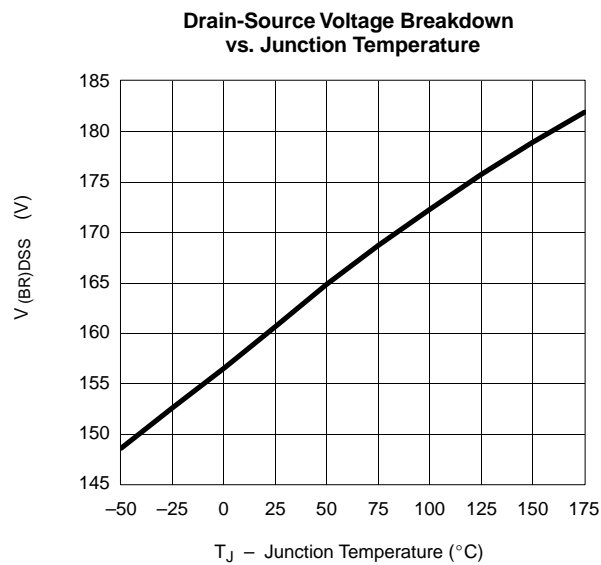
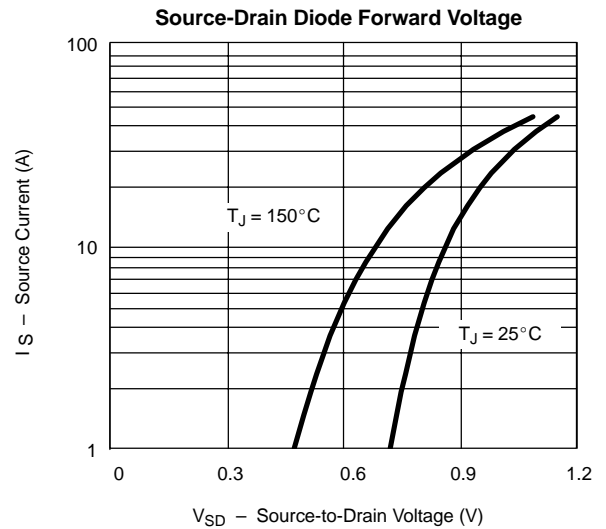
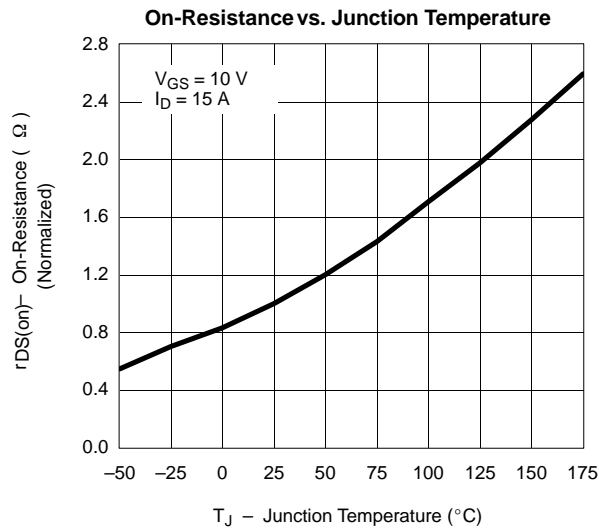
- a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.
- c. Guaranteed by design, not subject to production testing.
- b. Independent of operating temperature.



**TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)**



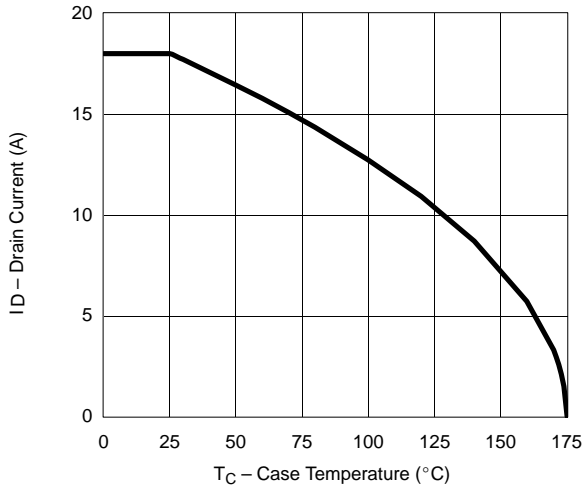
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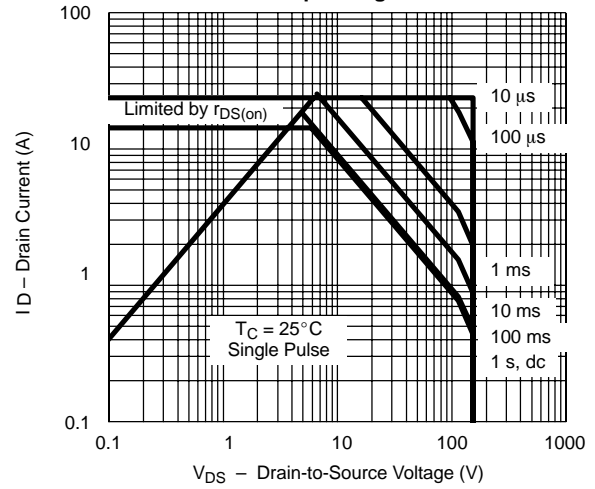


**THERMAL RATINGS**

Maximum Avalanche Drain Current  
vs. Case Temperature



Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Case

