

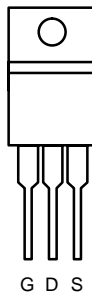


N-Channel 150-V (D-S) 175°C MOSFET

PRODUCT SUMMARY

V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
150	0.052 @ $V_{GS} = 10$ V	28
	0.060 @ $V_{GS} = 6$ V	26

TO-220AB



Top View

SUP28N15-52

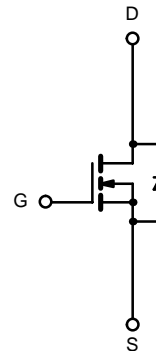
DRAIN connected to TAB

FEATURES

- TrenchFET® Power MOSFET
- 175°C Junction Temperature
- PWM Optimized

APPLICATIONS

- Primary Side Switch



N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	150	V
Gate-Source Voltage		V_{GS}	± 20	
Continuous Drain Current ($T_J = 175^\circ\text{C}$) ^b	$T_C = 25^\circ\text{C}$	I_D	28	A
	$T_C = 125^\circ\text{C}$		16	
Pulsed Drain Current		I_{DM}	50	
Continuous Source Current (Diode Conduction)		I_S	28	
Avalanche Current		I_{AR}	25	mJ
Repetitive Avalanche Energy (Duty Cycle $\leq 1\%$)		E_{AR}	31	
Maximum Power Dissipation	$T_C = 25^\circ\text{C}$	P_D	120 ^b	W
	$T_A = 25^\circ\text{C}$ (mounted) ^a		3.75 ^a	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55 to 175	$^\circ\text{C}$

THERMAL RESISTANCE RATINGS

Parameter		Symbol	Typical	Unit
Junction-to-Ambient ^a	PCB Mount ^a	R_{thJA}	40	$^\circ\text{C/W}$
	Free Air		62.5	
Junction-to-Case (Drain)		R_{thJC}	1.25	

Notes

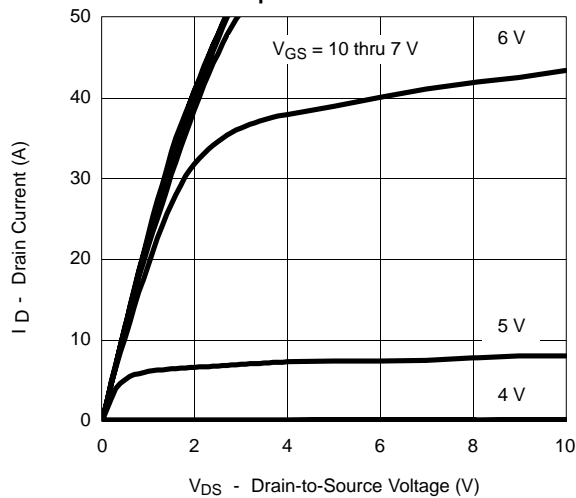
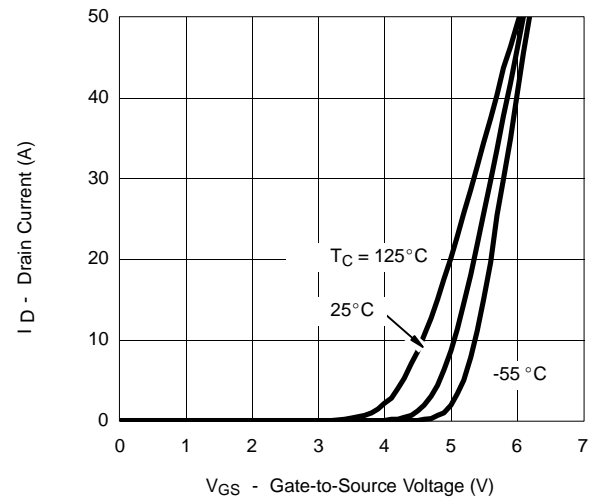
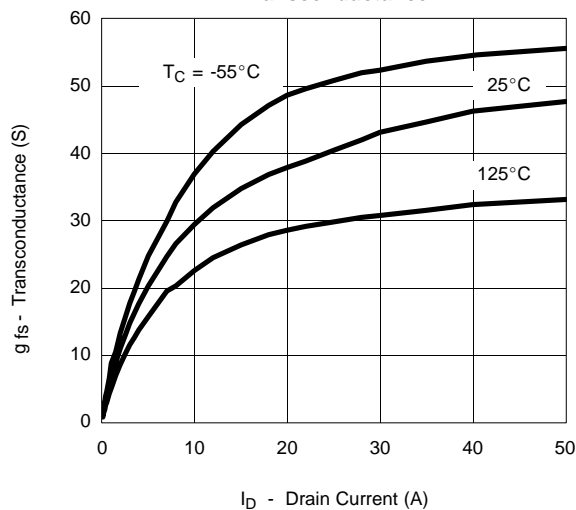
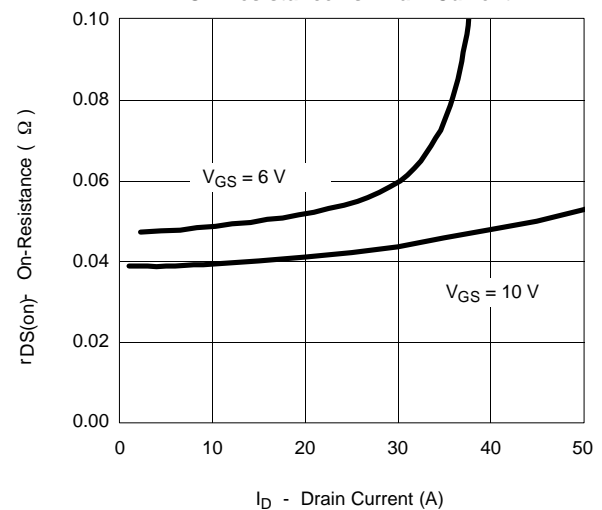
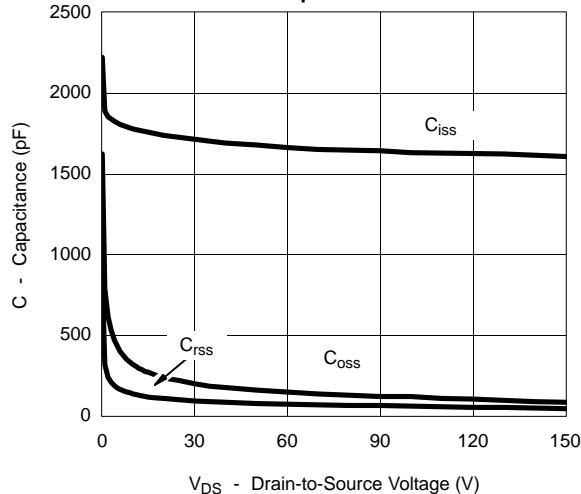
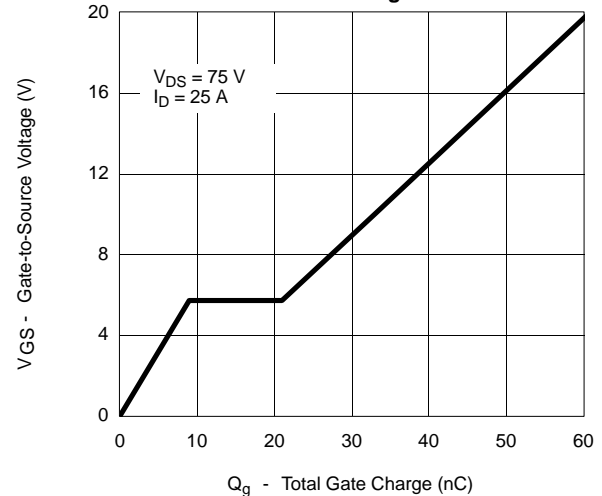
- a. Surface Mounted on 1" x 1" FR4 Board.
b. See SOA curve for voltage derating.

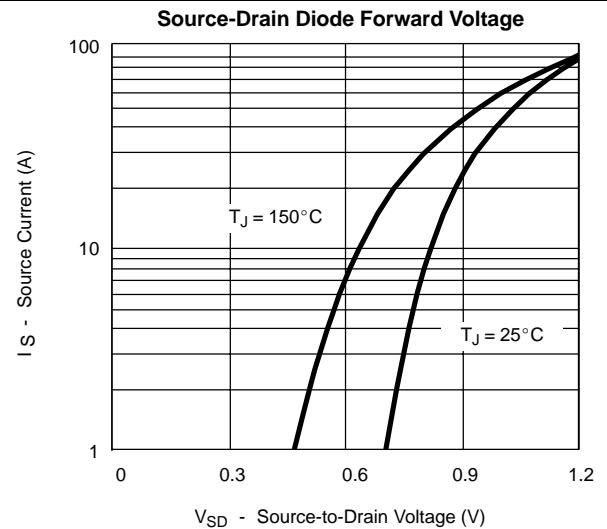
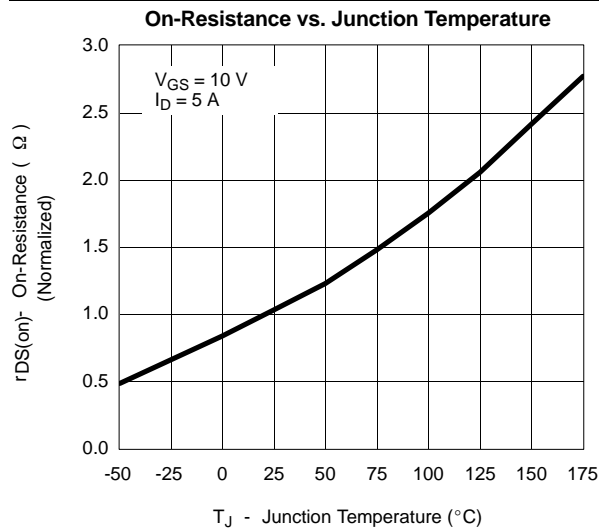
SPECIFICATIONS ($T_J = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)

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		4.5	
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	50			A
Drain-Source On-State Resistance ^b	r _{DS(on)}	V _{GS} = 10 V, I _D = 5 A		0.042	0.052	Ω
		V _{GS} = 10 V, I _D = 5 A, T _J = 125°C			0.109	
		V _{GS} = 10 V, I _D = 5 A, T _J = 175°C			0.145	
		V _{GS} = 6 V, I _D = 5 A		0.047	0.060	
Forward Transconductance ^b	g _{fs}	V _{DS} = 15 V, I _D = 25 A		40		S
Dynamic ^a						
Input Capacitance	C _{iss}	V _{GS} = 0 V, V _{DS} = 25 V, F = 1 MHz		1725		pF
Output Capacitance	C _{oss}			216		
Reverse Transfer Capacitance	C _{rss}			100		
Total Gate Charge ^c	Q _g	V _{DS} = 75 V, V _{GS} = 10 V, I _D = 28 A		33	40	nC
Gate-Source Charge ^c	Q _{gs}			9		
Gate-Drain Charge ^c	Q _{gd}			12		
Turn-On Delay Time ^c	t _{d(on)}	V _{DD} = 50 V, R _L = 3 Ω I _D ≅ 28 A, V _{GEN} = 10 V, R _G = 2.5 Ω		15	25	ns
Rise Time ^c	t _r			70	100	
Turn-Off Delay Time ^c	t _{d(off)}			25	40	
Fall Time ^c	t _f			60	40	
Source-Drain Diode Ratings and Characteristic (T _C = 25°C)						
Pulsed Current	I _{SM}				50	A
Diode Forward Voltage ^b	V _{SD}	I _F = 25 A, V _{GS} = 0 V		0.9	1.5	V
Source-Drain Reverse Recovery Time	t _{rr}	I _F = 28 A, di/dt = 100 A/μs		95	140	ns

Notes

- a. Guaranteed by design, not subject to production testing.
b. Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.
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)**THERMAL RATINGS**