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SUP60N10-16L Vishay Siliconix

N-Channel 100-V (D-S) 175°C MOSFET

PRODUCT SUMMARY

$V_{(BR)DSS}$ (V)	$r_{DS(on)}$ (Ω)	I_D (A)
100	0.016 @ $V_{GS} = 10$ V	60
	0.018 @ $V_{GS} = 4.5$ V	56

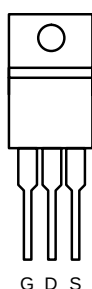
FEATURES

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

APPLICATIONS

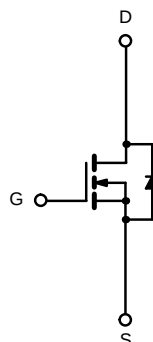
- DC/DC Primary Side Switch

TO-220AB



Top View
SUP60N10-16L

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}	100	V
Gate-Source Voltage	V_{GS}	± 20	
Continuous Drain Current ($T_J = 175^\circ\text{C}$)	I_D	60	A
		35	
Pulsed Drain Current	I_{DM}	100	
Avalanche Current	I_{AR}	40	
Repetitive Avalanche Energy ^a	E_{AR}	80	mJ
Maximum Power Dissipation ^a		150 ^b	
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}	62.5	$^\circ\text{C/W}$
Junction-to-Case	R_{thJC}	1.0	

Notes

- Duty cycle $\leq 1\%$.
- See SOA curve for voltage derating.
- When mounted on 1" square PCB (FR-4 material).



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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 _{GS} = 0 V, I _D = 250 μA	100			V
Gate-Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250 μA	1		3	
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ± 20 V			± 100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 80 V, V _{GS} = 0 V			1	μA
		V _{DS} = 80 V, V _{GS} = 0 V, T _J = 125 °C			50	
		V _{DS} = 80 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	100			A
Drain-Source On-State Resistance ^a	r _{DS(on)}	V _{GS} = 10 V, I _D = 30 A		0.0125	0.016	Ω
		V _{GS} = 4.5 V, I _D = 20 A		0.014	0.018	
		V _{GS} = 10 V, I _D = 30 A, T _J = 125 °C			0.030	
		V _{GS} = 10 V, I _D = 30 A, T _J = 175 °C			0.040	
Forward Transconductance ^a	g _{fs}	V _{DS} = 15 V, I _D = 30 A	25			S
Dynamic ^b						
Input Capacitance	C _{iss}	V _{GS} = 0 V, V _{DS} = 25 V, f = 1 MHz		3820		pF
Output Capacitance	C _{oss}			450		
Reverse Transfer Capacitance	C _{rss}			210		
Total Gate Charge ^c	Q _g	V _{DS} = 50 V, V _{GS} = 10 V, I _D = 60 A		73	110	nC
Gate-Source Charge ^c	Q _{gs}			15		
Gate-Drain Charge ^c	Q _{gd}			20		
Gate Resistance	R _G			1.5		Ω
Turn-On Delay Time ^c	t _{d(on)}	V _{DD} = 50 V, R _L = 0.83 Ω I _D ≅ 60 A, V _{GEN} = 10 V, R _G = 2.5 Ω		12	25	ns
Rise Time ^c	t _r			90	135	
Turn-Off Delay Time ^c	t _{d(off)}			55	85	
Fall Time ^c	t _f			130	195	
Source-Drain Diode Ratings and Characteristics (T _C = 25 °C) ^b						
Continuous Current	I _S				60	A
Pulsed Current	I _{SM}				100	
Forward Voltage ^a	V _{SD}	I _F = 60 A, V _{GS} = 0 V		1.0	1.5	V
Reverse Recovery Time	t _{rr}	I _F = 50 A, di/dt = 100 A/μs		62	100	ns
Peak Reverse Recovery Current	I _{RM(REC)}			3.1	5	A
Reverse Recovery Charge	Q _{rr}				0.10	0.25

Notes

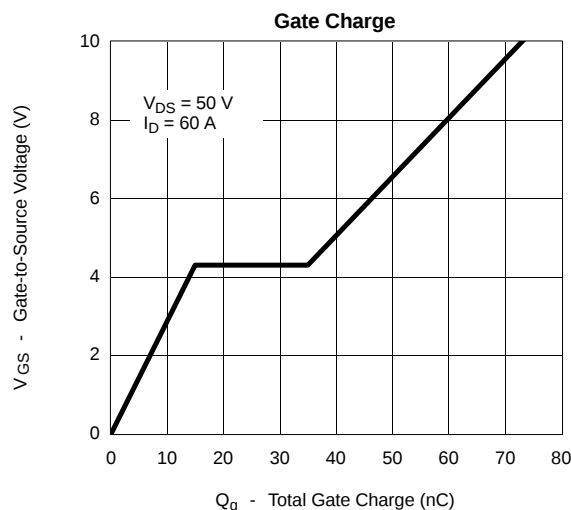
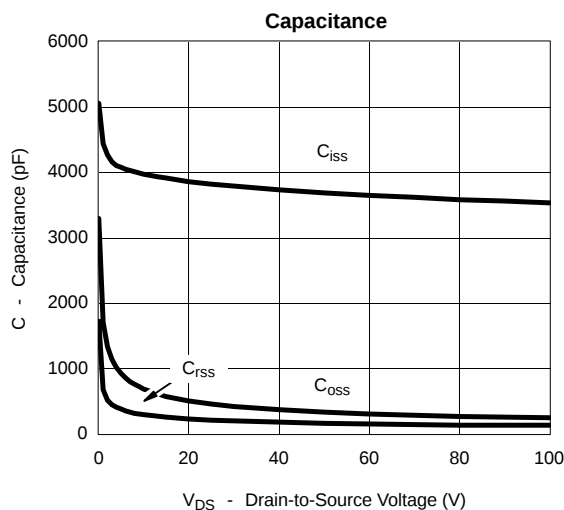
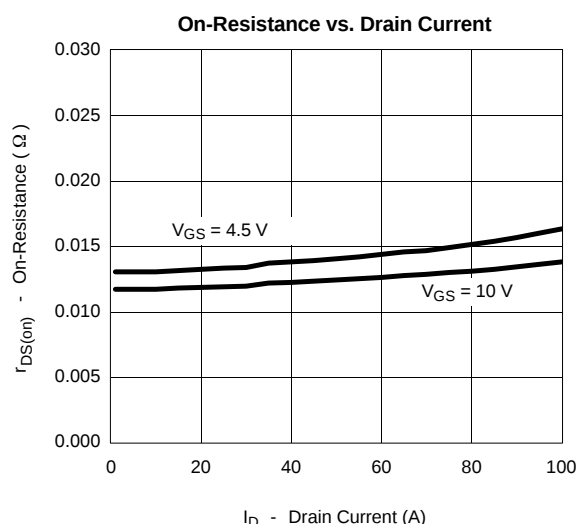
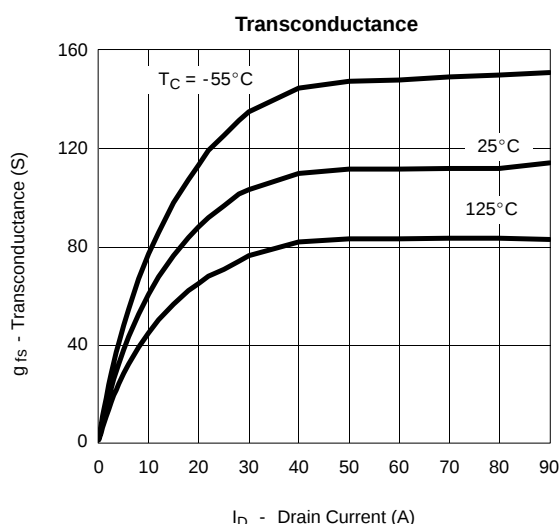
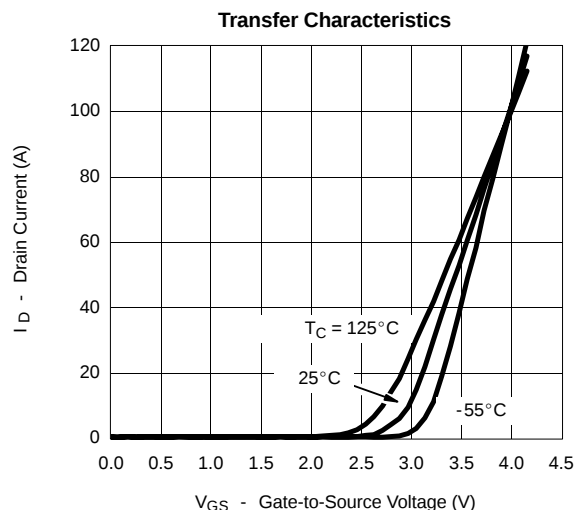
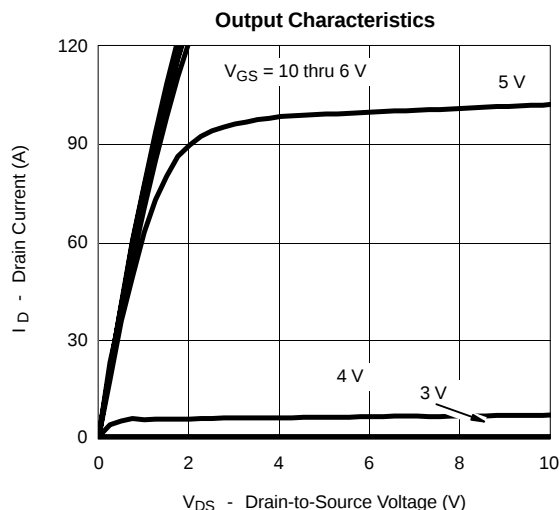
- Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.
- Guaranteed by design, not subject to production testing.
- Independent of operating temperature.



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TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)

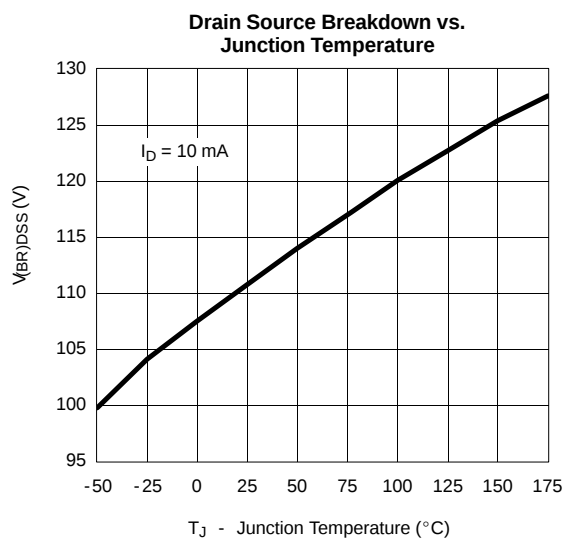
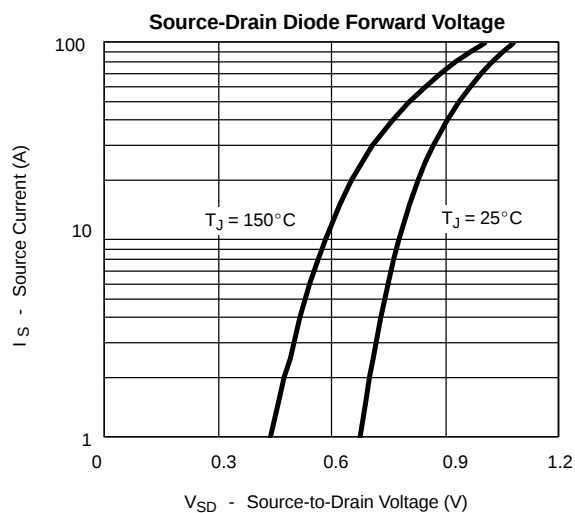
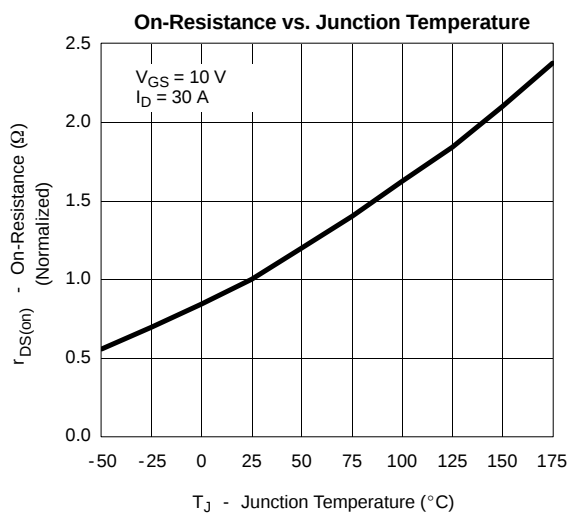


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TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)



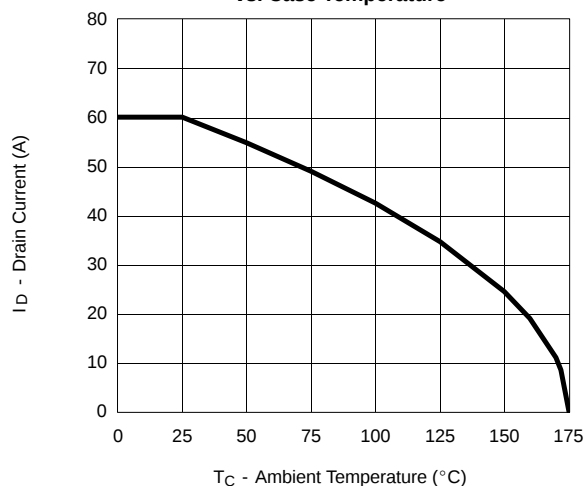


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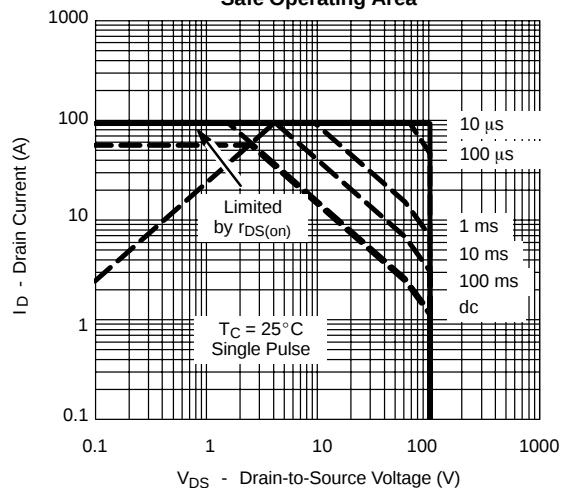
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THERMAL RATINGS

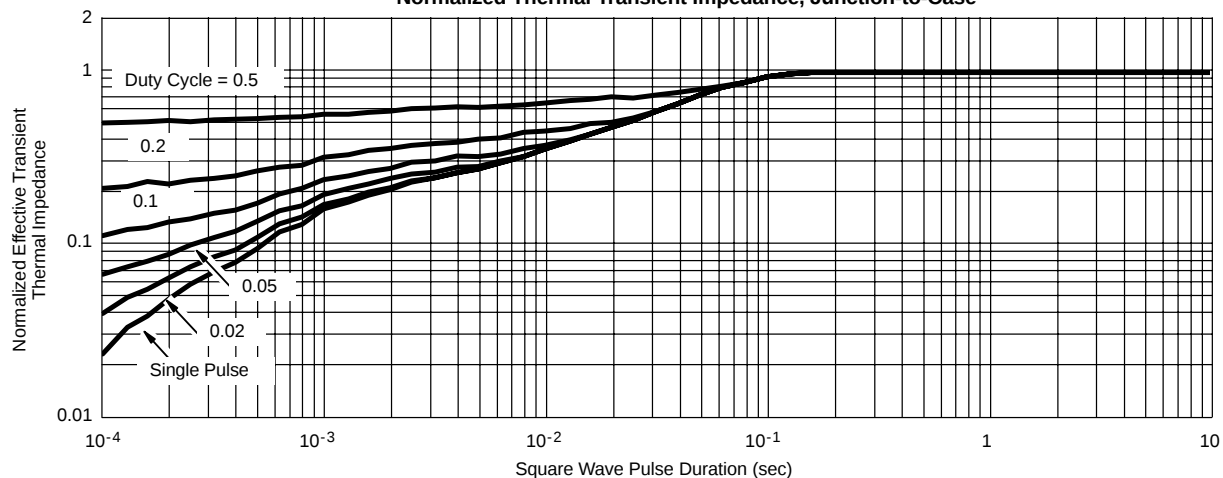
Maximum Avalanche and Drain Current
vs. Case Temperature



Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Case





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