

N-Channel 150 V (D-S) 175 °C MOSFET

PRODUCT SUMMARY

V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A)
150	0.095 at $V_{GS} = 10$ V	15
	0.100 at $V_{GS} = 6$ V	15

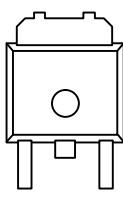
FEATURES

- TrenchFET® Power MOSFETs
- 175 °C Junction Temperature
- 100 % R_g Tested
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912



RoHS
COMPLIANT

TO-252



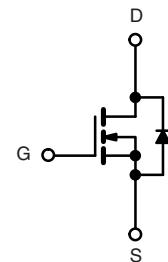
Drain Connected to Tab

Top View

Ordering Information: SUD15N15-95-E3 (Lead (Pb) free)

APPLICATIONS

- Primary Side Switch



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) ^b	I_D	15	
		8.7	
Pulsed Drain Current	I_{DM}	25	A
Continuous Source Current (Diode Conduction)	I_S	15	
Avalanche Current	I_{AR}	15	
Repetitive Avalanche Energy (Duty Cycle ≤ 1 %)	E_{AR}	11.3	mJ
Maximum Power Dissipation	P_D	62 ^b	W
		2.7 ^a	
Operating Junction and Storage Temperature Range	T_J, T_{stg}	- 55 to 175	°C

THERMAL RESISTANCE RATINGS

Parameter	Symbol	Typical	Maximum	Unit
Junction-to-Ambient ^a	R_{thJA}	16	20	°C/W
		45	55	
Junction-to-Case	R_{thJC}	2	2.4	

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 Conditions	Min.	Typ. ^a	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V_{DS}	$V_{GS} = 0 \text{ V}$, $I_D = 250 \mu\text{A}$	150			V
Gate Threshold Voltage	$V_{GS(\text{th})}$	$V_{DS} = V_{GS}$, $I_D = 250 \mu\text{A}$	2			
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0 \text{ V}$, $V_{GS} = \pm 20 \text{ V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 120 \text{ V}$, $V_{GS} = 0 \text{ V}$		1		μA
		$V_{DS} = 120 \text{ V}$, $V_{GS} = 0 \text{ V}$, $T_J = 125^\circ\text{C}$		50		
		$V_{DS} = 120 \text{ V}$, $V_{GS} = 0 \text{ V}$, $T_J = 175^\circ\text{C}$		250		
On-State Drain Current ^b	$I_{D(\text{on})}$	$V_{DS} = 5 \text{ V}$, $V_{GS} = 10 \text{ V}$	25			A
Drain-Source On-State Resistance ^b	$R_{DS(\text{on})}$	$V_{GS} = 10 \text{ V}$, $I_D = 15 \text{ A}$		0.077	0.095	Ω
		$V_{GS} = 10 \text{ V}$, $I_D = 15 \text{ A}$, $T_J = 125^\circ\text{C}$			0.190	
		$V_{GS} = 10 \text{ V}$, $I_D = 15 \text{ A}$, $T_J = 175^\circ\text{C}$			0.250	
		$V_{GS} = 6 \text{ V}$, $I_D = 10 \text{ A}$		0.081	0.100	
Forward Transconductance ^b	g_{fs}	$V_{DS} = 15 \text{ V}$, $I_D = 15 \text{ A}$		25		S
Dynamic^a						
Input Capacitance	C_{iss}	$V_{GS} = 0 \text{ V}$, $V_{DS} = 25 \text{ V}$, $f = 1 \text{ MHz}$		900		pF
Output Capacitance	C_{oss}			115		
Reverse Transfer Capacitance	C_{rss}			70		
Total Gate Charge ^c	Q_g	$V_{DS} = 75 \text{ V}$, $V_{GS} = 10 \text{ V}$, $I_D = 15 \text{ A}$		20	25	nC
Gate-Source Charge ^c	Q_{gs}			5.5		
Gate-Drain Charge ^c	Q_{gd}			7		
Gate Resistance	R_g		1		3.2	Ω
Turn-On Delay Time ^c	$t_{d(\text{on})}$	$V_{DD} = 75 \text{ V}$, $R_L = 5 \Omega$ $I_D \geq 15 \text{ A}$, $V_{GEN} = 10 \text{ V}$, $R_G = 2.5 \Omega$		8	12	ns
Rise Time ^c	t_r			35	55	
Turn-Off Delay Time ^c	$t_{d(\text{off})}$			17	25	
Fall Time ^c	t_f			30	45	
Source-Drain Diode Ratings and Characteristic ($T_C = 25^\circ\text{C}$)						
Pulsed Current	I_{SM}				25	A
Diode Forward Voltage ^b	V_{SD}	$I_F = 15 \text{ A}$, $V_{GS} = 0 \text{ V}$		0.9	1.5	V
Source-Drain Reverse Recovery Time	t_{rr}	$I_F = 15 \text{ A}$, $dl/dt = 100 \text{ A}/\mu\text{s}$		55	85	ns

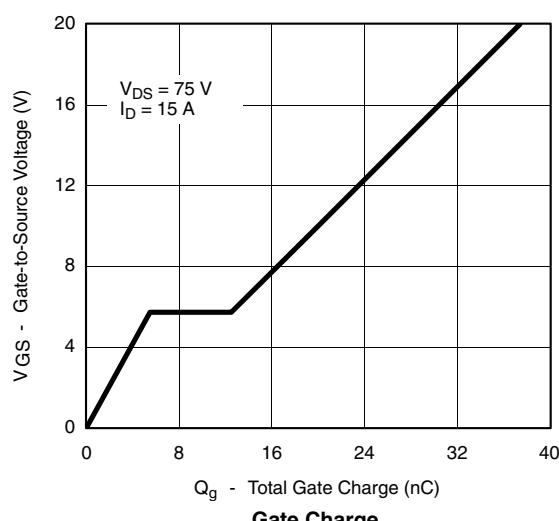
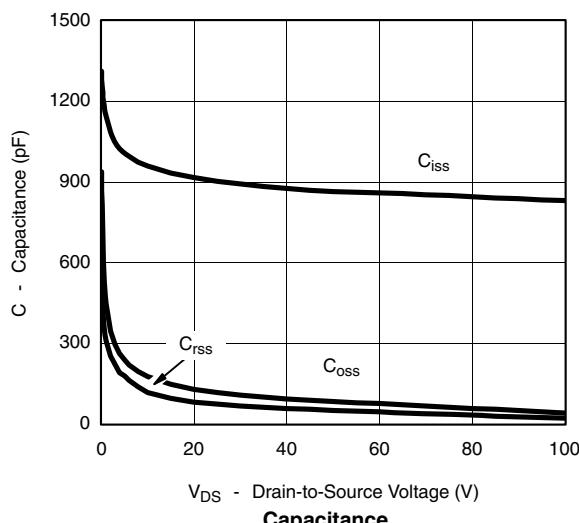
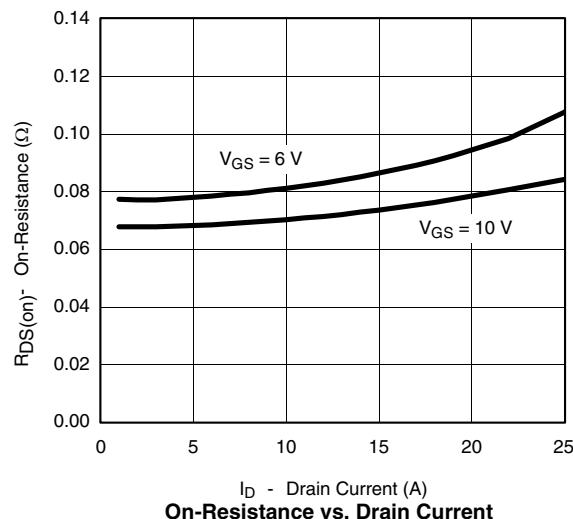
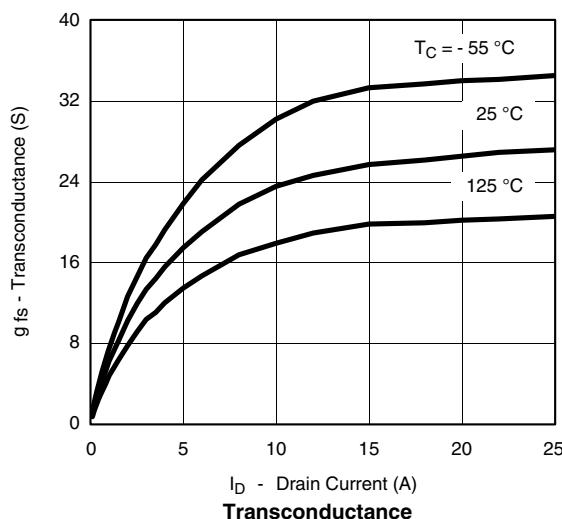
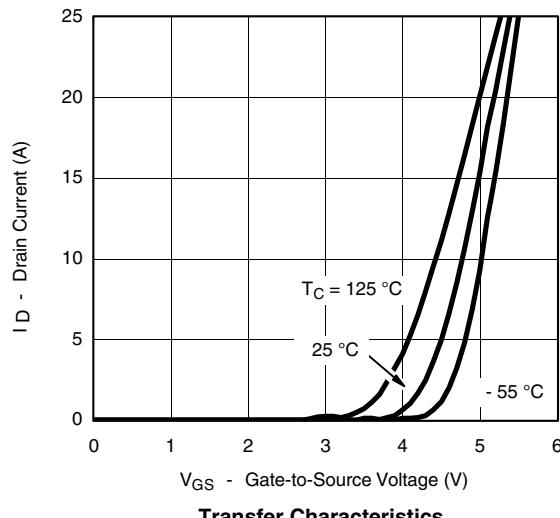
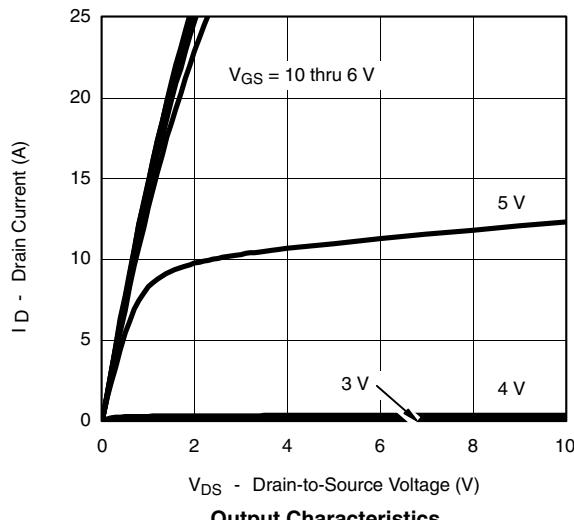
Notes:

a. Guaranteed by design, not subject to production testing.

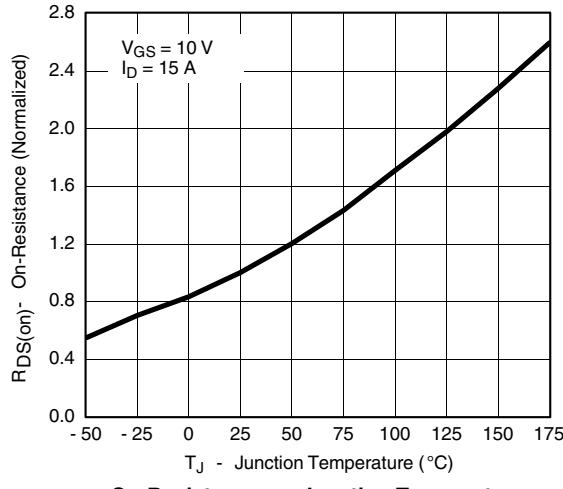
b. Pulse test; pulse width $\leq 300 \mu\text{s}$, duty cycle $\leq 2\%$.

c. Independent of operating temperature.

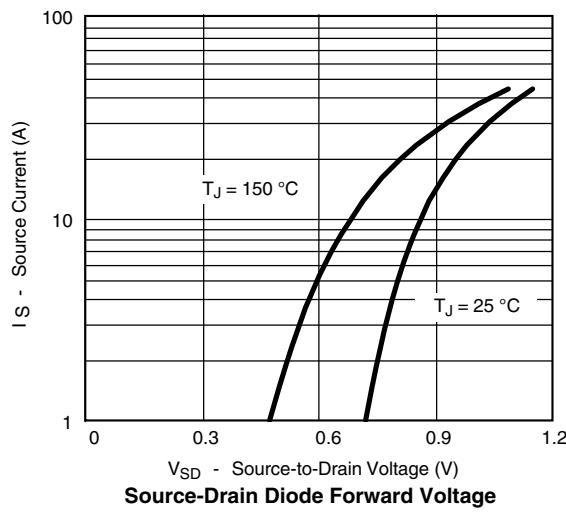
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

TYPICAL CHARACTERISTICS (25 °C unless noted)


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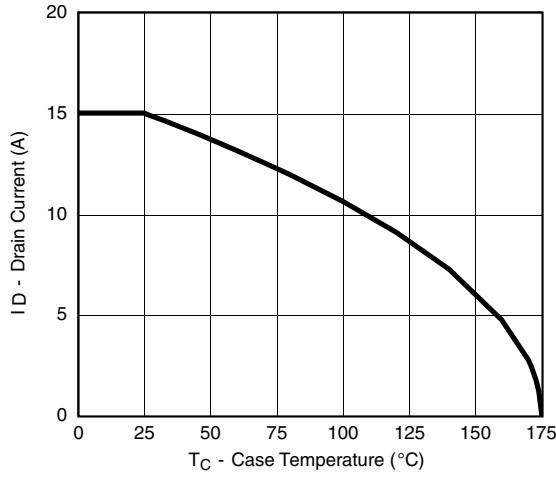


On-Resistance vs. Junction Temperature

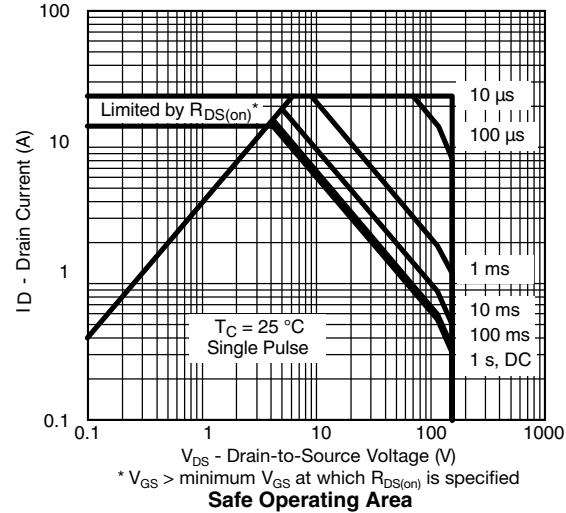


Source-Drain Diode Forward Voltage

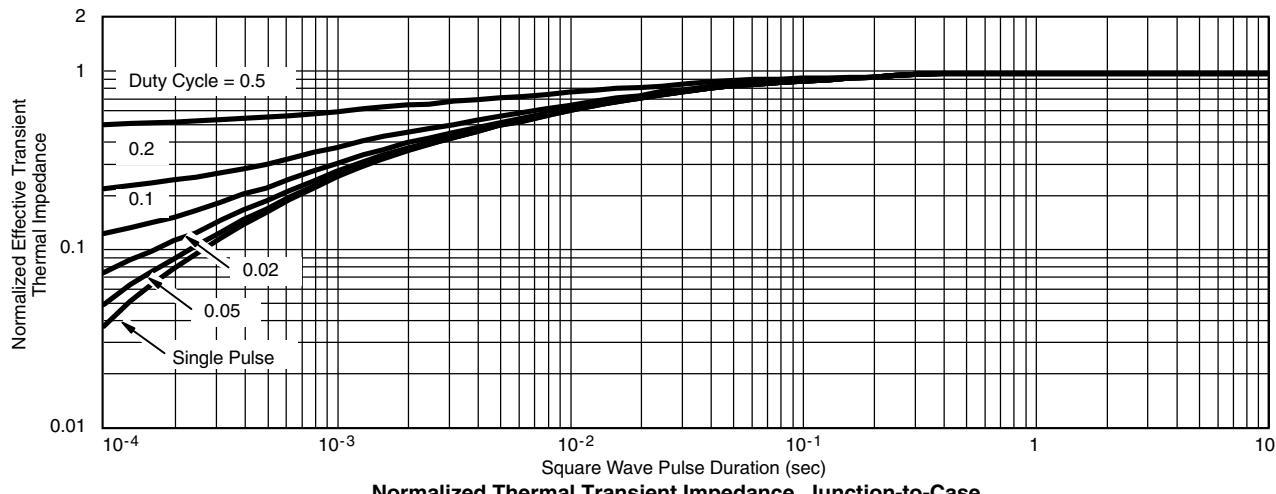
THERMAL RATINGS



Maximum Avalanche Drain Current vs. Case Temperature



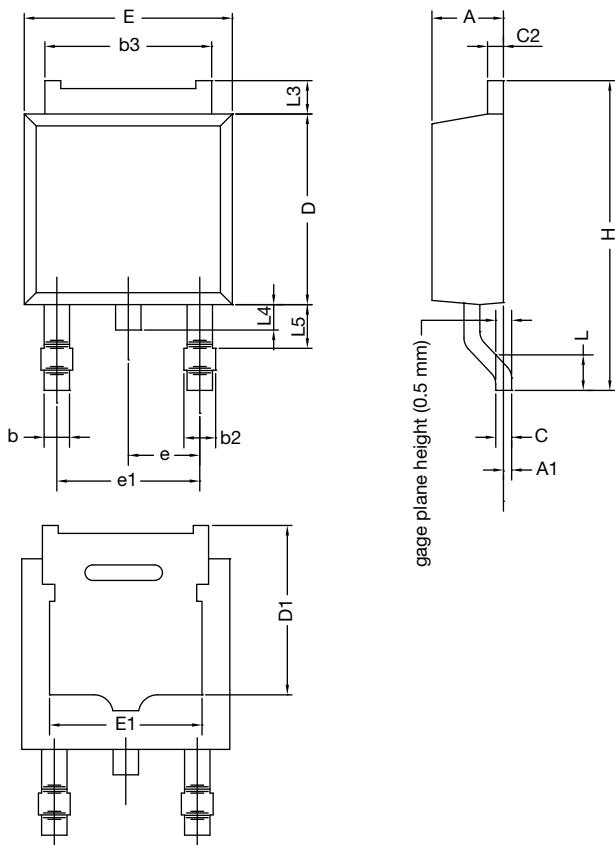
* V_{GS} > minimum V_{GS} at which $R_{DS(on)}$ is specified
Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Case

Vishay Siliconix maintains worldwide manufacturing capability. Products may be manufactured at one of several qualified locations. Reliability data for Silicon Technology and Package Reliability represent a composite of all qualified locations. For related documents such as package/tape drawings, part marking, and reliability data, see www.vishay.com/ppg?71641.

TO-252AA CASE OUTLINE

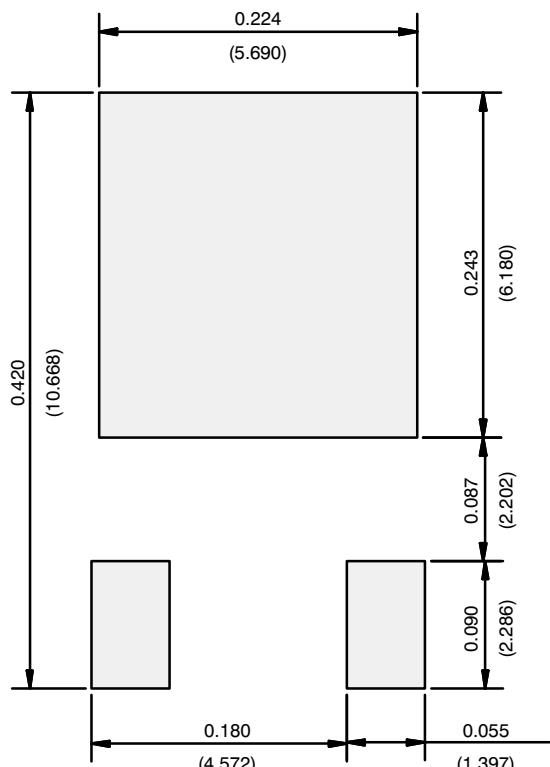


DIM.	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	2.18	2.38	0.086	0.094
A1	-	0.127	-	0.005
b	0.64	0.88	0.025	0.035
b2	0.76	1.14	0.030	0.045
b3	4.95	5.46	0.195	0.215
C	0.46	0.61	0.018	0.024
C2	0.46	0.89	0.018	0.035
D	5.97	6.22	0.235	0.245
D1	5.21	-	0.205	-
E	6.35	6.73	0.250	0.265
E1	4.32	-	0.170	-
H	9.40	10.41	0.370	0.410
e	2.28 BSC		0.090 BSC	
e1	4.56 BSC		0.180 BSC	
L	1.40	1.78	0.055	0.070
L3	0.89	1.27	0.035	0.050
L4	-	1.02	-	0.040
L5	1.14	1.52	0.045	0.060

ECN: X12-0247-Rev. M, 24-Dec-12
DWG: 5347

Note

- Dimension L3 is for reference only.

RECOMMENDED MINIMUM PADS FOR DPAK (TO-252)

Recommended Minimum Pads
Dimensions in Inches/(mm)

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