

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

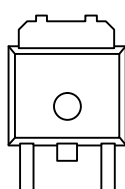


RoHS
COMPLIANT

APPLICATIONS

- Primary Side Switch

TO-252

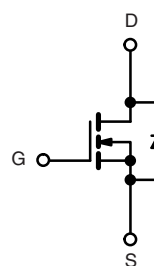


G D S

Top View

Drain Connected to Tab

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



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	A
		8.7	
Pulsed Drain Current	I_{DM}	25	
Continuous Source Current (Diode Conduction)	I_S	15	
Avalanche Current	I_{AR}	15	mJ
Repetitive Avalanche Energy (Duty Cycle ≤ 1 %)	E_{AR}	11.3	
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.

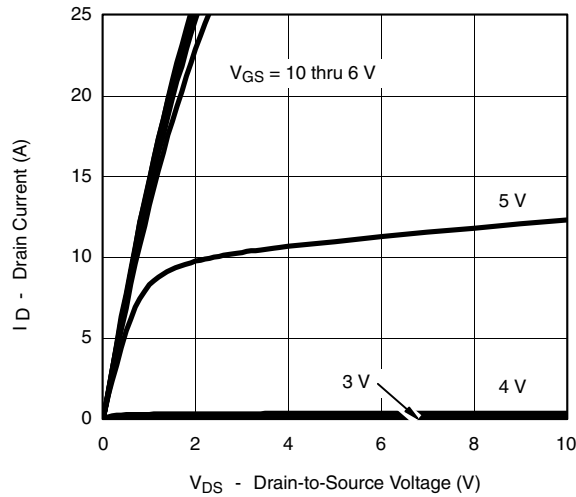
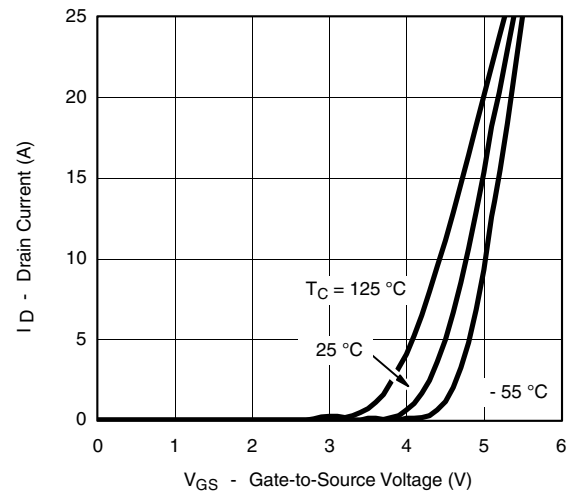
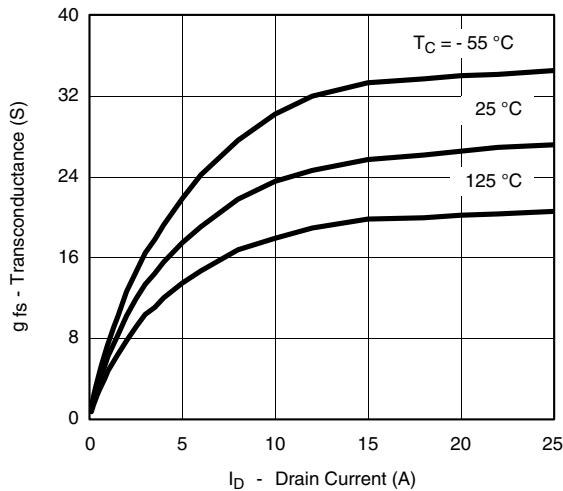
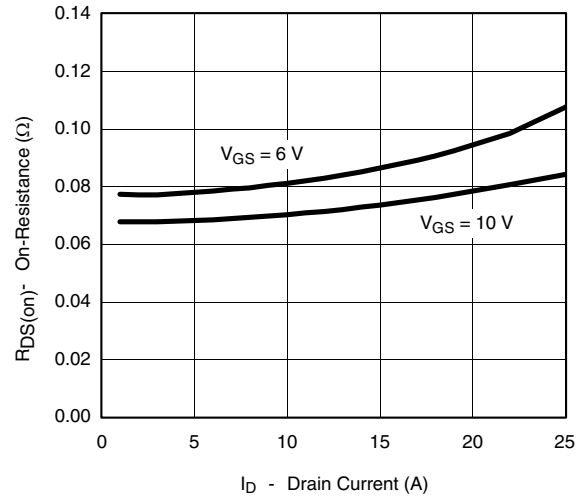
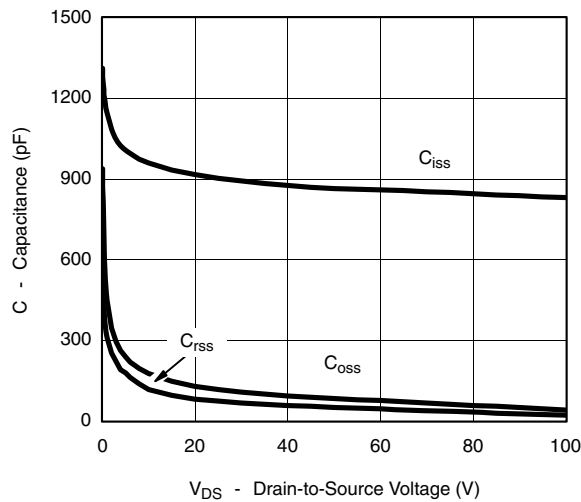
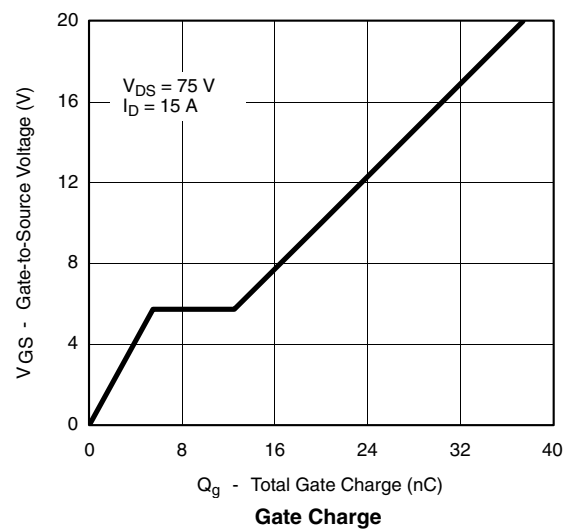
b. See SOA curve for voltage derating.

SPECIFICATIONS (T _J = 25 °C, unless otherwise noted)						
Parameter	Symbol	Test Conditions	Min.	Typ. ^a	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V _{DS}	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		
Gate Resistance	R _g		1		3.2	Ω
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 Characteristic (T _C = 25 °C)						
Pulsed Current	I _{SM}				25	A
Diode Forward Voltage ^b	V _{SD}	I _F = 15 A, V _{GS} = 0 V		0.9	1.5	V
Source-Drain Reverse Recovery Time	t _{rr}	I _F = 15 A, dI/dt = 100 A/μs		55	85	ns

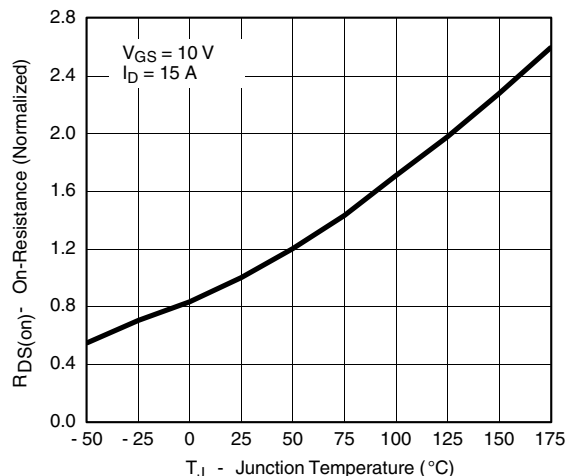
Notes:

- 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.

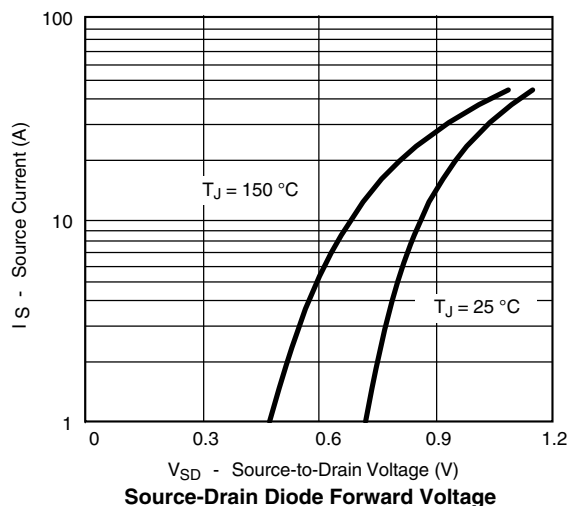
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure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

TYPICAL CHARACTERISTICS (25 °C unless noted)

Output Characteristics

Transfer Characteristics

Transconductance

On-Resistance vs. Drain Current

Capacitance

Gate Charge

TYPICAL CHARACTERISTICS (25 °C unless noted)

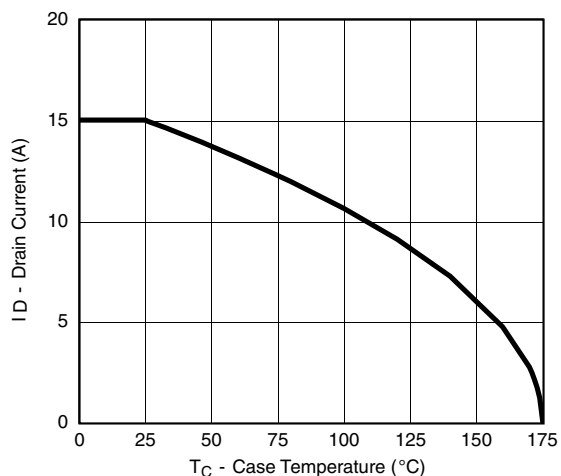


On-Resistance vs. Junction Temperature

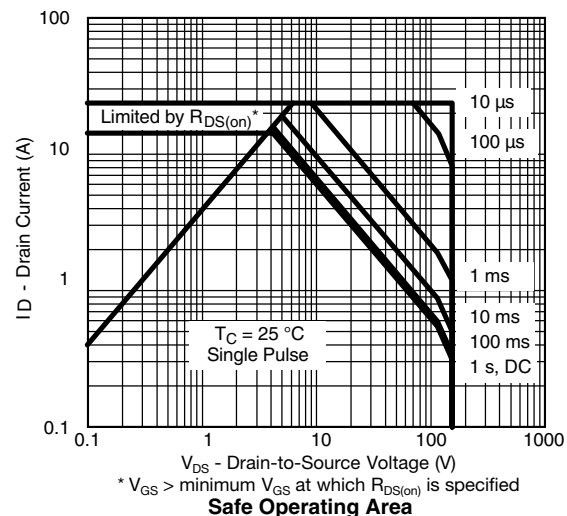


Source-Drain Diode Forward Voltage

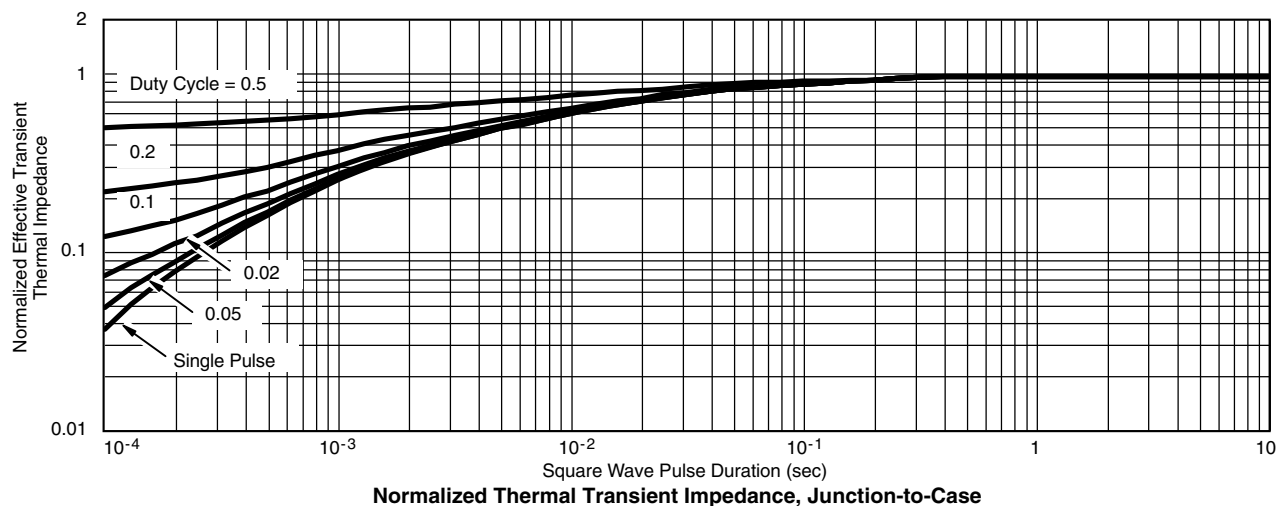
THERMAL RATINGS



Maximum Avalanche Drain Current vs. Case Temperature



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

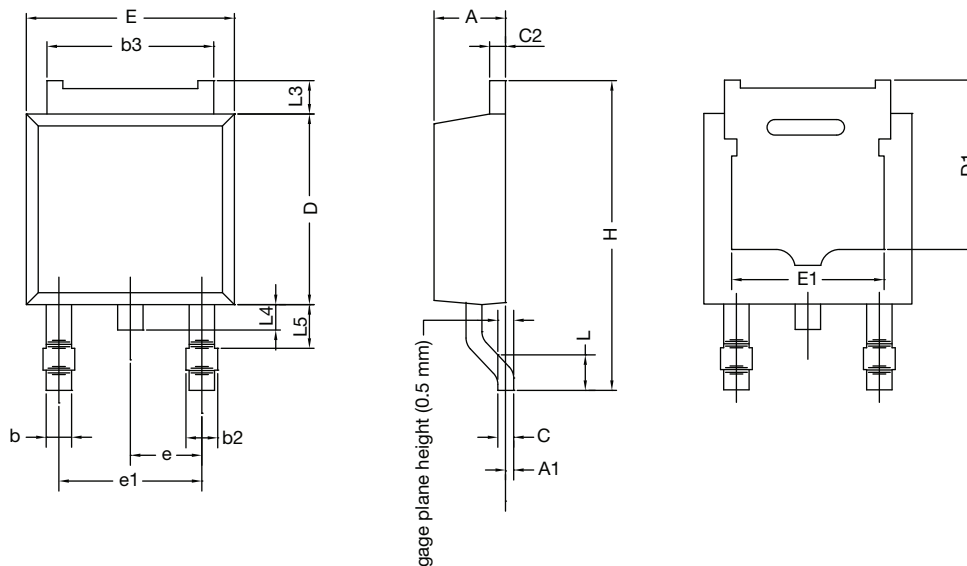


Normalized Thermal Transient Impedance, Junction-to-Case

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

VERSION 1: FACILITY CODE = Y



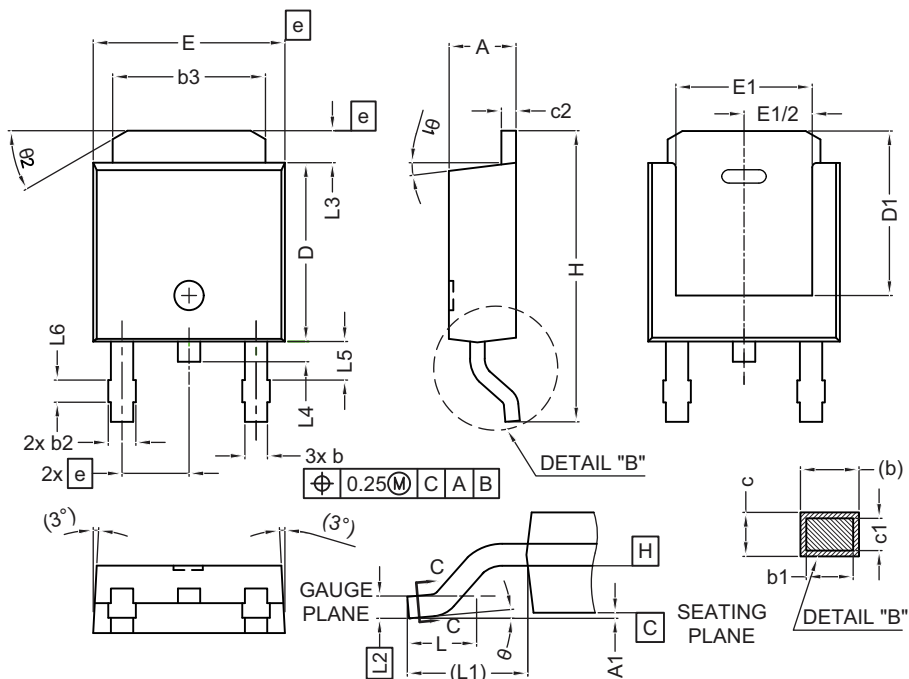
MILLIMETERS		
DIM.	MIN.	MAX.
A	2.18	2.38
A1	-	0.127
b	0.64	0.88
b2	0.76	1.14
b3	4.95	5.46
C	0.46	0.61
C2	0.46	0.89
D	5.97	6.22
D1	4.10	-
E	6.35	6.73
E1	4.32	-
H	9.40	10.41
e	2.28 BSC	
e1	4.56 BSC	
L	1.40	1.78
L3	0.89	1.27
L4	-	1.02
L5	1.01	1.52

Note

- Dimension L3 is for reference only



VERSION 2: FACILITY CODE = N



DIM.	MILLIMETERS	
	MIN.	MAX.
A	2.18	2.39
A1	-	0.13
b	0.65	0.89
b1	0.64	0.79
b2	0.76	1.13
b3	4.95	5.46
c	0.46	0.61
c1	0.41	0.56
c2	0.46	0.60
D	5.97	6.22
D1	5.21	-
E	6.35	6.73
E1	4.32	-
e	2.29 BSC	
H	9.94	10.34

DIM.	MILLIMETERS	
	MIN.	MAX.
L	1.50	1.78
L1	2.74 ref.	
L2	0.51 BSC	
L3	0.89	1.27
L4	-	1.02
L5	1.14	1.49
L6	0.65	0.85
θ	0°	10°
θ_1	0°	15°
θ_2	25°	35°

Notes

- Dimensioning and tolerance confirm to ASME Y14.5M-1994
- All dimensions are in millimeters. Angles are in degrees
- Heat sink side flash is max. 0.8 mm
- Radius on terminal is optional

ECN: E22-0399-Rev. R, 03-Oct-2022
DWG: 5347

RECOMMENDED MINIMUM PADS FOR DPAK (TO-252)



Recommended Minimum Pads
Dimensions in Inches/(mm)

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