N-Channel 100 V (D-S) MOSFET

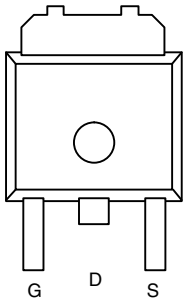
PRODUCT SUMMARY			
V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A)	Q_g (Typ)
100	0.200 at V_{GS} = 10 V	6.5	2.7
	0.225 at V_{GS} = 4.5 V	6	

FEATURES

- TrenchFET® Power MOSFETs
- Material categorization:
  For definitions of compliance please see www.vishay.com/doc?99912

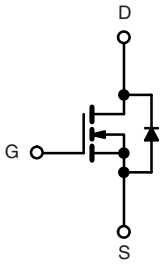
RoHS COMPLIANT
HALOGEN FREE

TO-252



Drain Connected to Tab

Top View



N-Channel MOSFET

Order Number:
SUD06N10-225L-GE3 (Lead (Pb)-free and Halogen-free)

ABSOLUTE MAXIMUM RATINGS (T_A = 25 °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 = 150 °C)[b]	T_C = 25 °C	I_D	6.5	A
	T_C = 125 °C		2.9	
Pulsed Drain Current		I_{DM}	8	
Continuous Source Current (Diode Conduction)		I_S	6.5	
Avalanche Current		I_{AR}	5	
Repetitive Avalanche Energy (Duty Cycle ≤ 1 %)	L = 0.1 mH	E_{AR}	1.25	mJ
Maximum Power Dissipation	T_C = 25 °C	P_D	16.7[b]	W
	T_A = 25 °C		1.25[a]	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	- 55 to 150	°C

THERMAL RESISTANCE RATINGS					
Parameter		**Symbol**	**Typical**	**Maximum**	**Unit**
Junction-to-Ambient[a]	t ≤ 10 sec	R_{thJA}	40	50	°C/W
	Steady State		80	100	
Junction-to-Case		R_{thJC}	6	7.5	

Notes:
a. Surface mounted on 1" x 1" FR4 board.
b. See SOA curve for voltage derating.

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SPECIFICATIONS (T_A = 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	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} = 100 V, V_{GS} = 0 V			1	µA
		V_{DS} = 100 V, V_{GS} = 0 V, T_J = 125 °C			50	
On-State Drain Current[b]	$I_{D(on)}$	V_{DS} = 5 V, V_{GS} = 10 V	8			A
Drain-Source On-State Resistance[b]	$R_{DS(on)}$	V_{GS} = 10 V, I_D = 3 A		0.160	0.200	Ω
		V_{GS} = 10 V, I_D = 3 A, T_J = 125 °C			0.350	
		V_{GS} = 4.5 V, I_D = 1 A		0.180	0.225	
Forward Transconductance[b]	g_{fs}	V_{DS} = 15 V, I_D = 3 A		8.5		S
Dynamic[a]						
Input Capacitance	C_{iss}	V_{GS} = 0 V, V_{DS} = 25 V, F = 1 MHz		240		pF
Output Capacitance	C_{oss}			42		
Reverse Transfer Capacitance	C_{rss}			17		
Total Gate Charge[c]	Q_g	V_{DS} = 50 V, V_{GS} = 5 V, I_D = 6.5 A		2.7	4	nC
Gate-Source Charge[c]	Q_{gs}			0.6		
Gate-Drain Charge[c]	Q_{gd}			0.7		
Turn-On Delay Time[c]	$t_{d(on)}$	V_{DD} = 50 V, R_L = 7.5 Ω I_D ≅ 6.5 A, V_{GEN} = 10 V, R_g = 2.5 Ω		7	11	ns
Rise Time[c]	t_r			8	12	
Turn-Off Delay Time[c]	$t_{d(off)}$			8	12	
Fall Time[c]	t_f			9	14	
Source-Drain Diode Ratings and Characteristics (T_C = 25 °C)						
Pulsed Current	I_{SM}				8	A
Diode Forward Voltage[b]	V_{SD}	I_F = 6.5 A, V_{GS} = 0 V		0.9	1.3	V
Source-Drain Reverse Recovery Time	t_{rr}	I_F = 6.5 A, dI/dt = 100 A/µs		35	60	ns

Notes:
a. Guaranteed by design, not subject to production testing.
b. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 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.

For technical questions, contact: pmostechsupport@vishay.com

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S13-0193-Rev. A, 28-Jan-13

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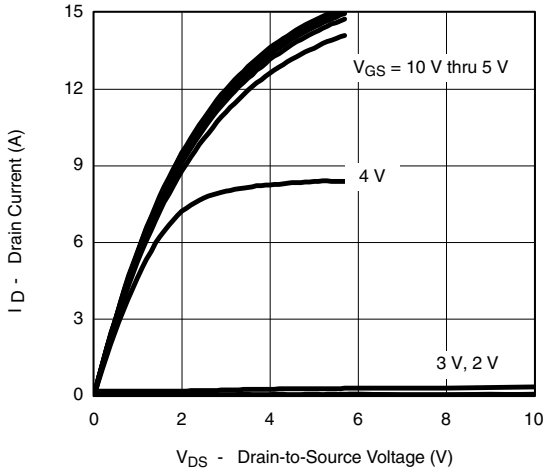
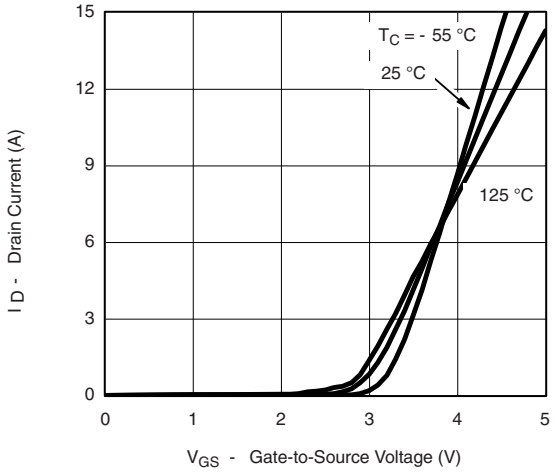
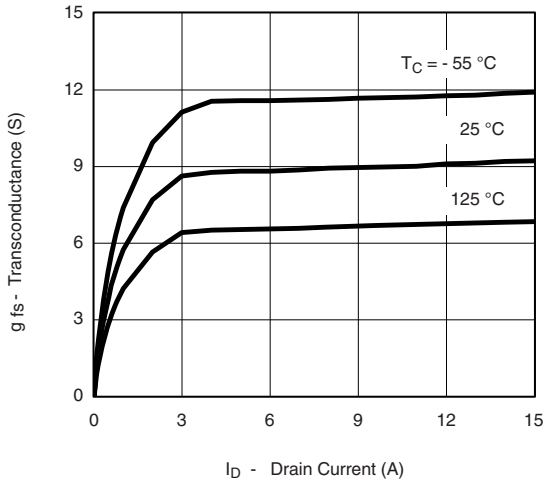
TYPICAL CHARACTERISTICS (T_A = 25 °C, unless otherwise noted)



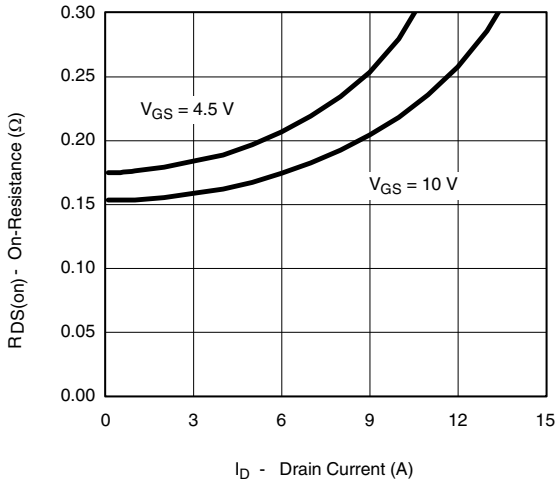
Output Characteristics



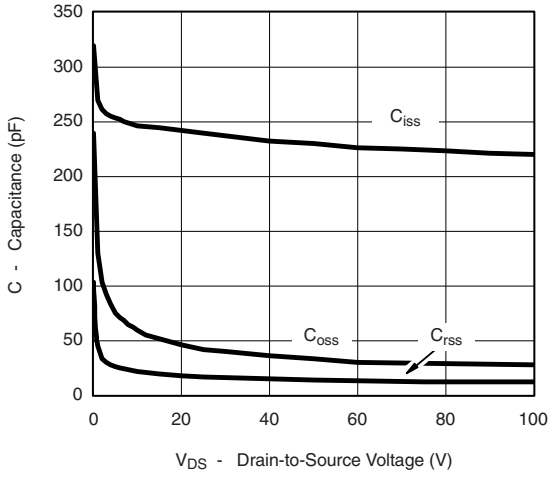
Transfer Characteristics



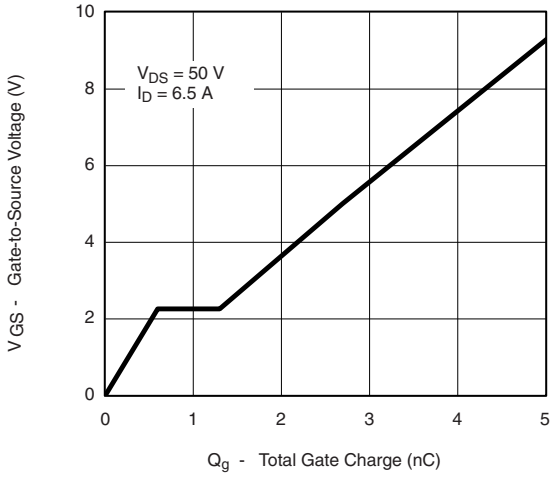
Transconductance



On-Resistance vs. Drain Current



Capacitance



Gate Charge

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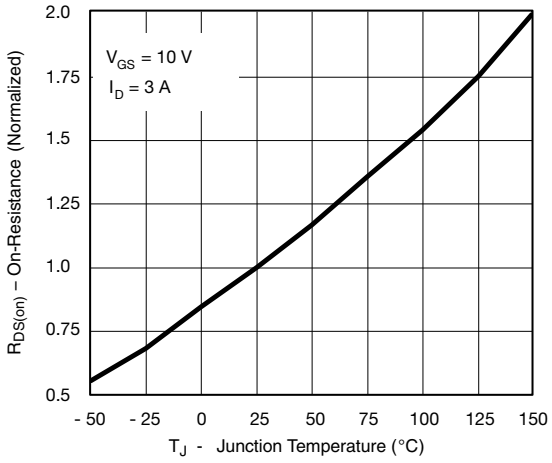
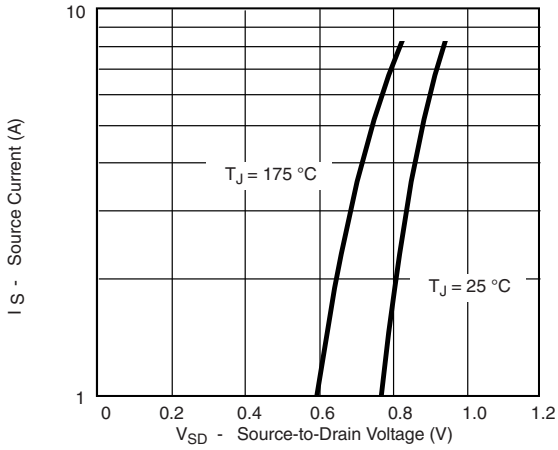
TYPICAL CHARACTERISTICS (T_A = 25 °C, unless otherwise noted)

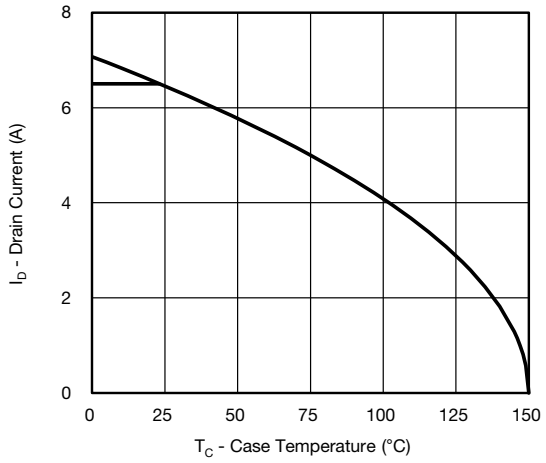


On-Resistance vs. Junction Temperature

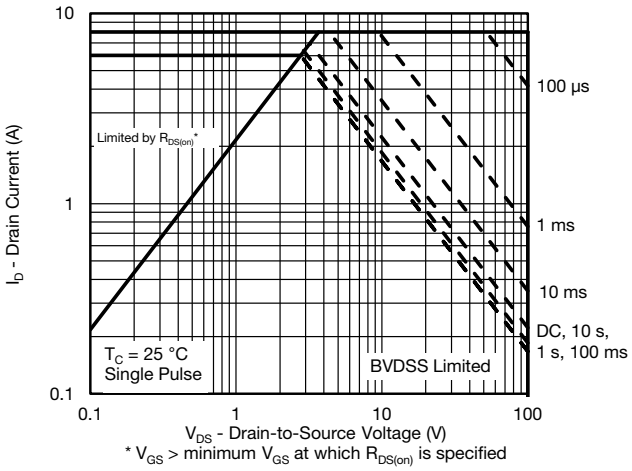


Source-Drain Diode Forward Voltage

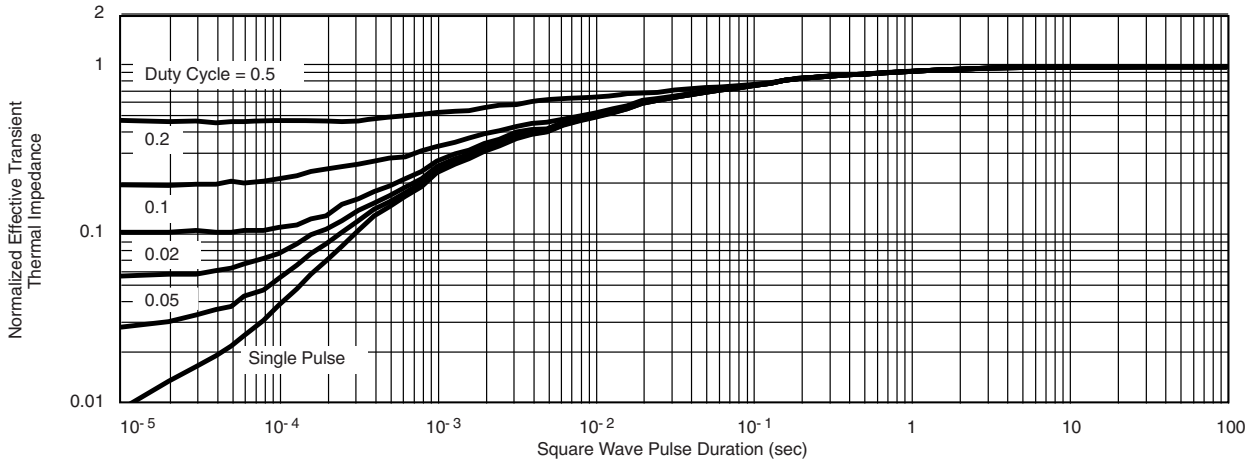
THERMAL RATINGS



Maximum Avalanche Drain Current vs. Case Temperature



Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Case

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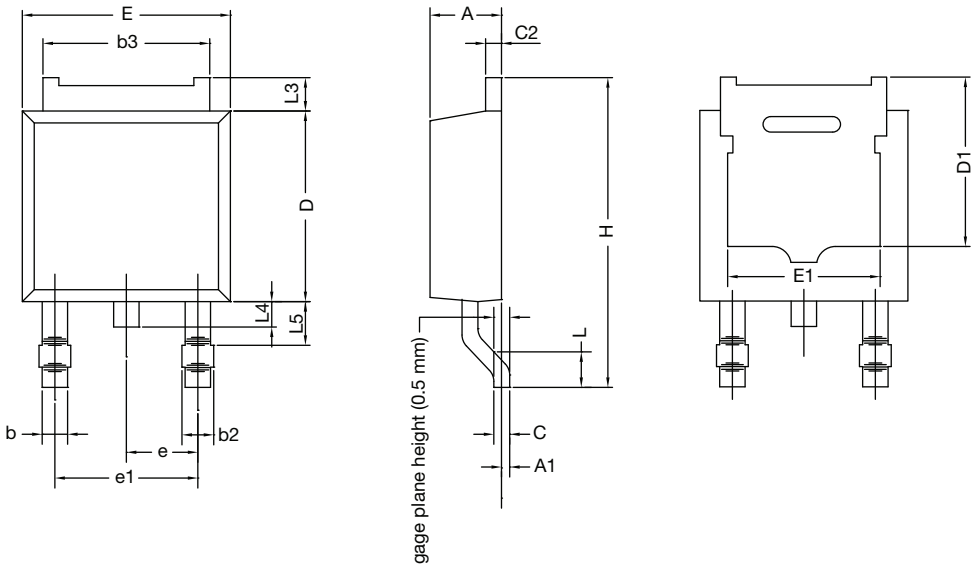
TO-252AA Case Outline

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

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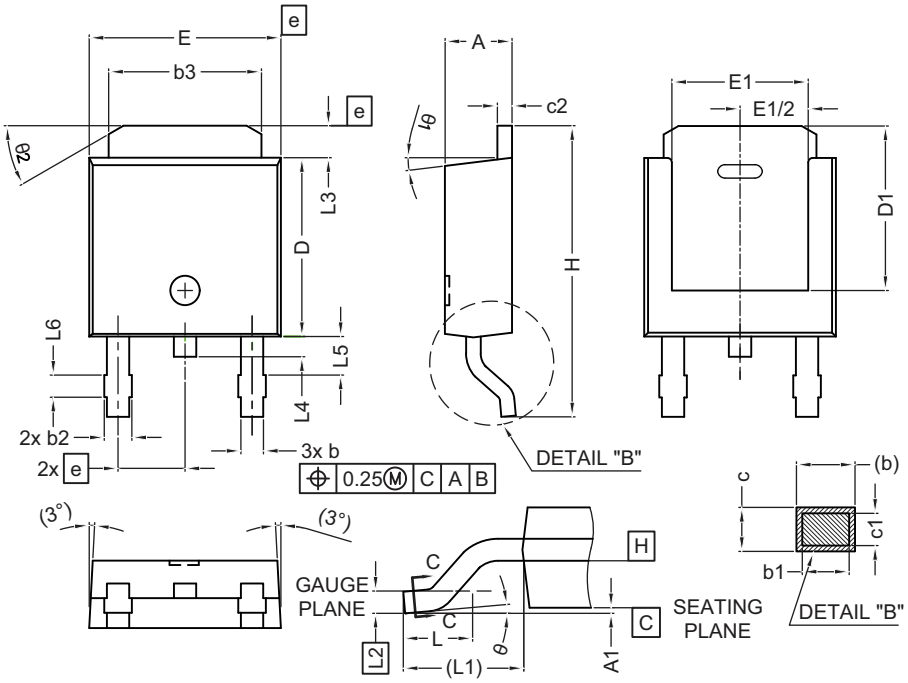
VERSION 2: FACILITY CODE = N



	MILLIMETERS	
DIM.	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

	MILLIMETERS	
DIM.	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°
θ1	0°	15°
θ2	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

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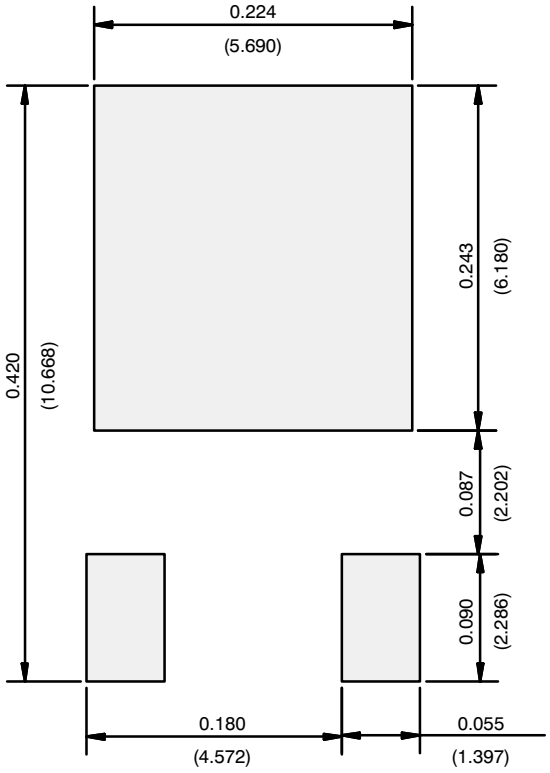
RECOMMENDED MINIMUM PADS FOR DPAK (TO-252)



Recommended Minimum Pads
Dimensions in Inches/(mm)

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APPLICATION NOTE

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