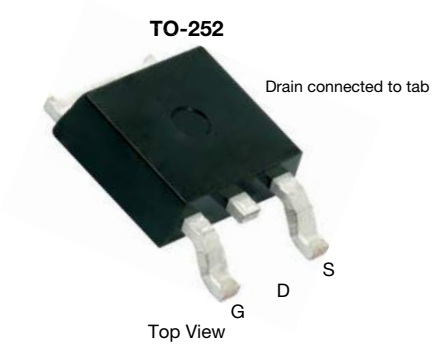
N-Channel 30 V (D-S) MOSFET

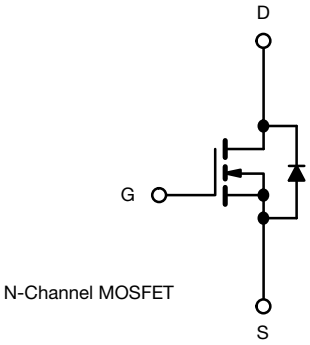
PRODUCT SUMMARY		
V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A) [a]
30	0.0120 at V_{GS} = 10 V	16.8
	0.0175 at V_{GS} = 4.5 V	13.9

FEATURES

- TrenchFET® power MOSFET
- 100 % R_g and UIS tested
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

RoHS COMPLIANT
HALOGEN FREE





Ordering Information:
SUD50N03-12P-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}	30	V
Gate-Source Voltage		V_{GS}	± 20	
Continuous Drain Current [a]	T_A = 25 °C	I_D	16.8	A
	T_A = 100 °C		10.6	
Pulsed Drain Current		I_{DM}	40	
Continuous Source Current (Diode Conduction) [a]		I_S	3.6	
Avalanche Current	L = 0.1 mH	I_{AS}	30	
Single Pulse Avalanche Energy		E_{AS}	45	mJ
Maximum Power Dissipation	T_C = 25 °C	P_D	39	W
	T_A = 25 °C		5.4 [a]	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55 to +150	°C

THERMAL RESISTANCE RATINGS					
PARAMETER		SYMBOL	TYPICAL	MAXIMUM	UNIT
Maximum Junction-to-Ambient [a]	t ≤ 10 s	R_{thJA}	18	23	°C/W
	Steady State		40	50	
Maximum Junction-to-Case		R_{thJC}	2.6	3.2	

Note

a. Surface mounted on FR4 board, t ≤ 10 s.

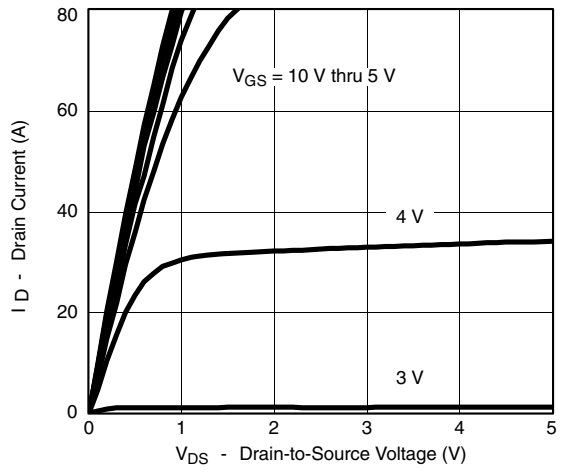
SPECIFICATIONS (T_J = 25 °C, unless otherwise noted)						
PARAMETER	**SYMBOL**	**TEST CONDITIONS**	**MIN.**	**TYP. [a]**	**MAX.**	**UNIT**
Static						
Drain-Source Breakdown Voltage	V_{DS}	V_{GS} = 0 V, I_D = 250 µA	30	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 µA	1	-	3	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ± 20 V	-	-	± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 24 V, V_{GS} = 0 V	-	-	1	µA
		V_{DS} = 24 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	40	-	-	A
Drain-Source On-State Resistance [b]	$R_{DS(on)}$	V_{GS} = 10 V, I_D = 20 A	-	0.0100	0.0120	Ω
		V_{GS} = 10 V, I_D = 20 A, T_J = 125 °C	-	-	0.0170	
		V_{GS} = 4.5 V, I_D = 15 A	-	0.0138	0.0175	
Forward Transconductance [b]	g_{fs}	V_{DS} = 15 V, I_D = 20 A	15	-	-	S
Dynamic [a]						
Input Capacitance	C_{iss}	V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz	-	1600	-	pF
Output Capacitance	C_{oss}		-	285	-	
Reverse Transfer Capacitance	C_{rss}		-	140	-	
Total Gate Charge [c]	Q_g	V_{DS} = 15 V, V_{GS} = 10 V, I_D = 50 A	-	28	42	nC
Gate-Source Charge [c]	Q_{gs}		-	6	-	
Gate-Drain Charge [c]	Q_{gd}		-	5	-	
Gate Resistance	R_g	f = 1 MHz	0.3	1.5	3.0	Ω
Turn-On Delay Time [c]	$t_{d(on)}$	V_{DD} = 15 V, R_L = 0.3 Ω I_D ≅ 50 A, V_{GEN} = 10 V, R_g = 2.5 Ω	-	9	15	ns
Rise Time [c]	t_r		-	15	25	
Turn-Off Delay Time [c]	$t_{d(off)}$		-	20	30	
Fall Time [c]	t_f		-	12	20	
Source-Drain Diode Ratings and Characteristics (T_C = 25 °C)						
Pulsed Current	I_{SM}		-	-	100	A
Diode Forward Voltage [b]	V_{SD}	I_F = 40 A, V_{GS} = 0 V	-	1.2	1.5	V
Source-Drain Reverse Recovery Time	t_{rr}	I_F = 50 A, dI/dt = 100 A/µs	-	25	70	ns

Notes

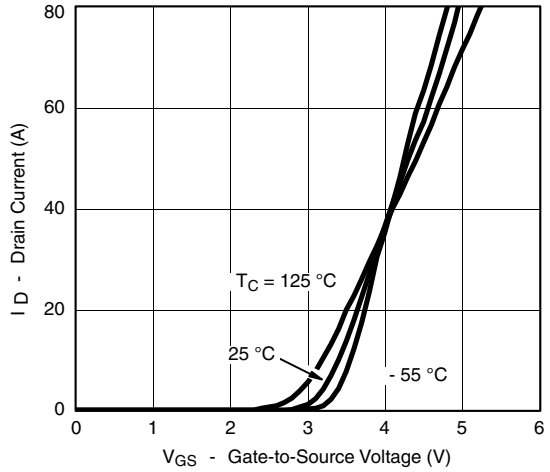
a. Guaranteed by design, not subject to production testing.
b. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2 %.
c. Independent of operating temperature.

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.

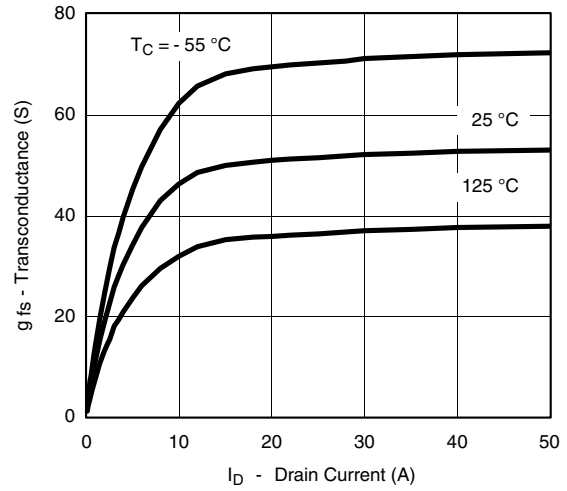
TYPICAL CHARACTERISTICS (25 °C unless noted)



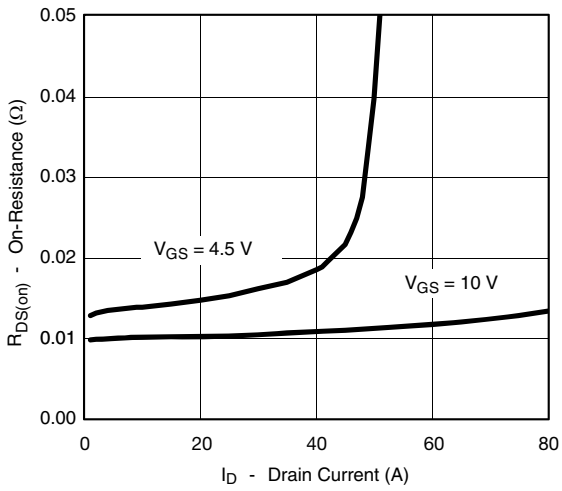
Output Characteristics



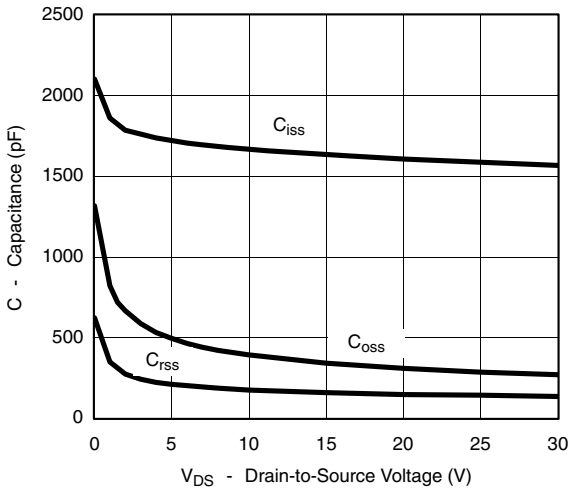
Transfer Characteristics



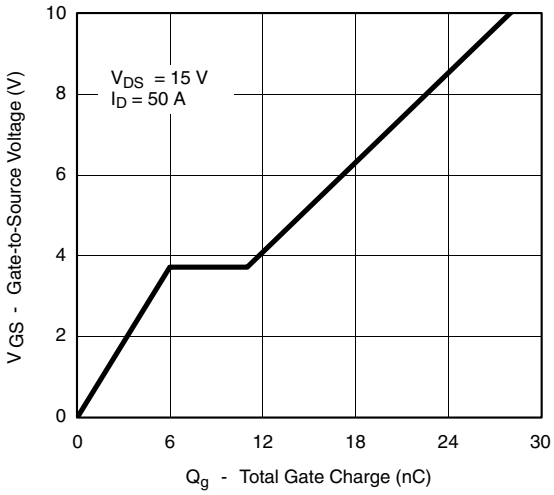
Transconductance



On-Resistance vs. Drain Current

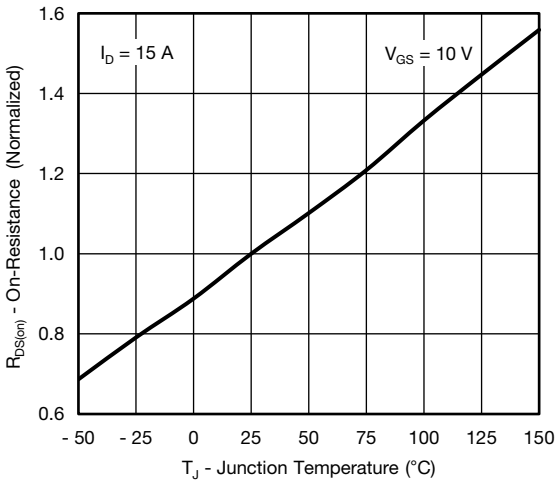


Capacitance

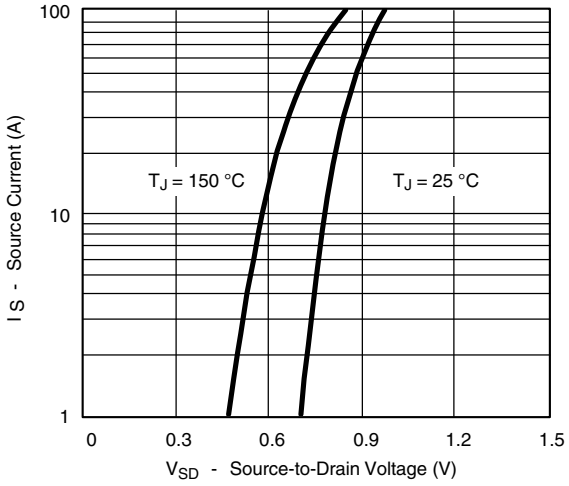


Gate Charge

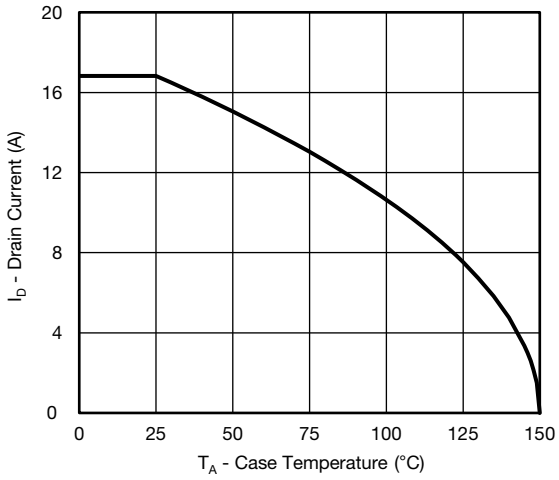
THERMAL RATINGS



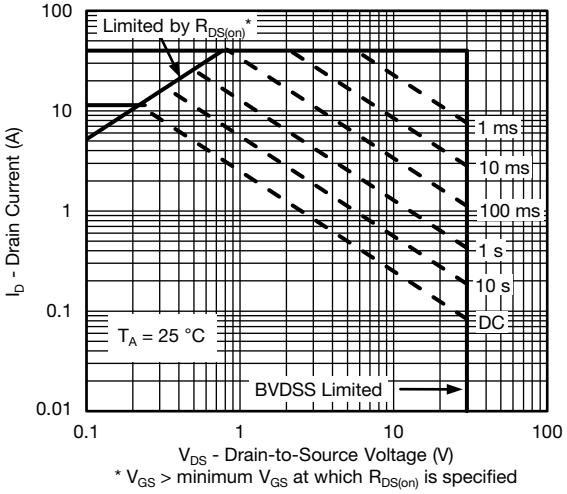
On-Resistance vs. Junction Temperature



Source-Drain Diode Forward Voltage

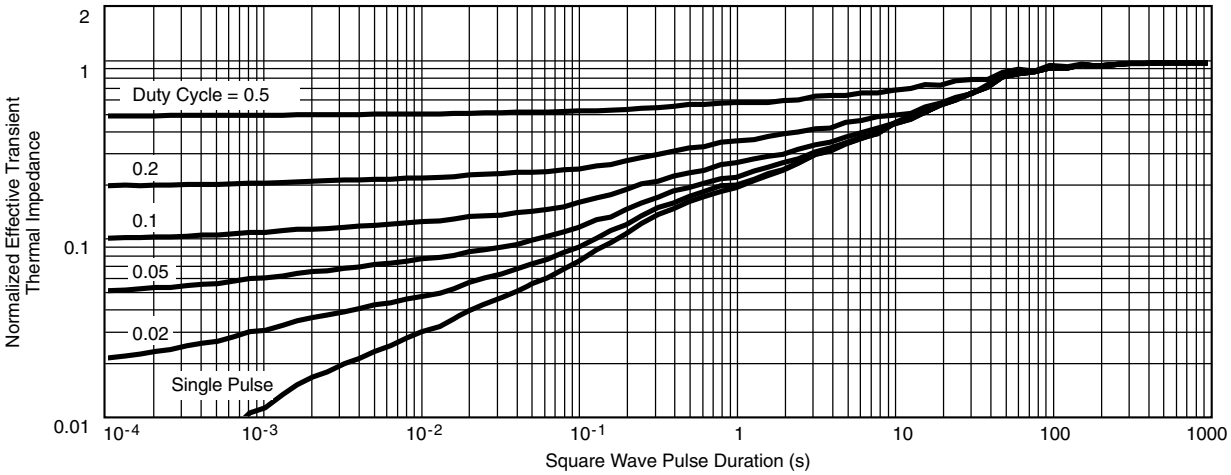


Maximum Drain Current vs. Ambient Temperature

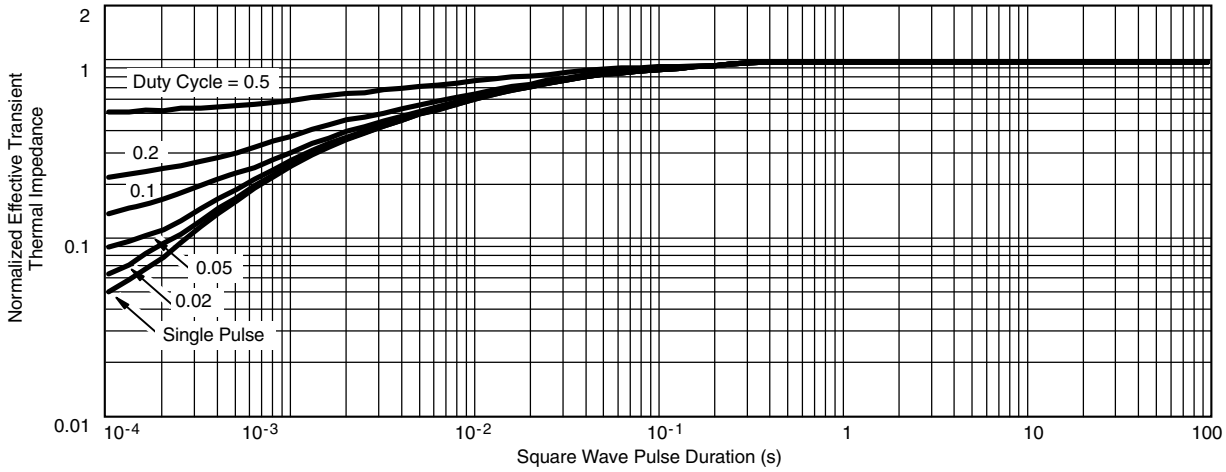


Safe Operating Area

THERMAL RATINGS



Normalized Thermal Transient Impedance, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Case

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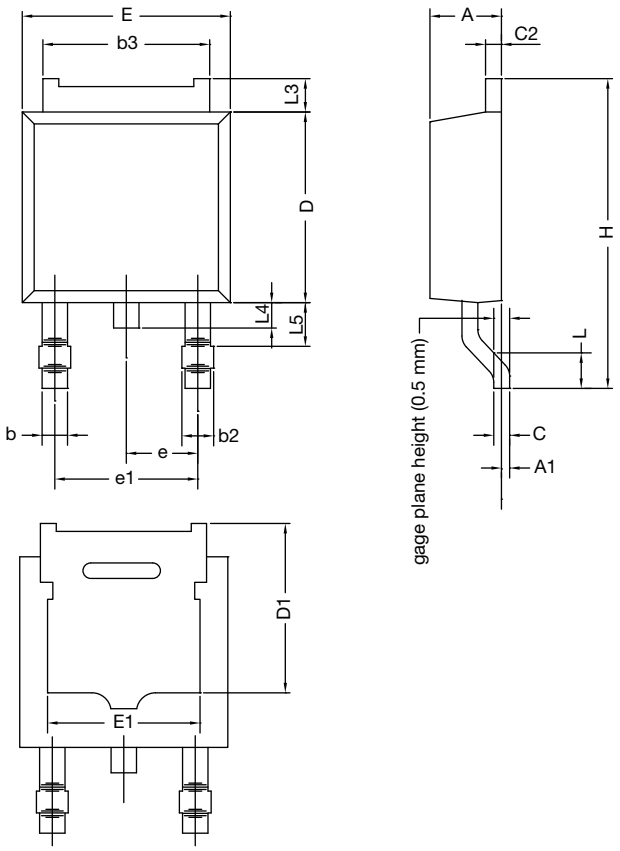
TO-252AA Case Outline

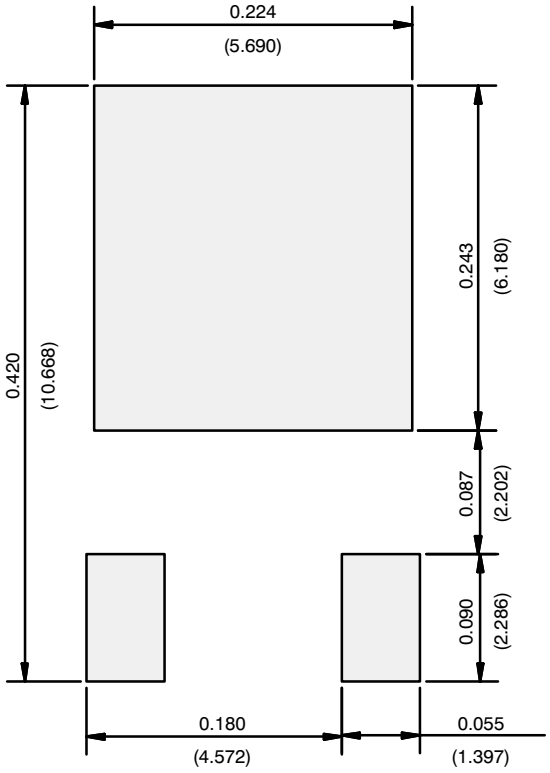


	MILLIMETERS		INCHES	
DIM.	MIN.	MAX.	MIN.	MAX.
A	2.18	2.38	0.086	0.094
A1	-	0.127	-	0.005
b	0.64	0.88	0.025	0.035
b2	0.76	1.14	0.030	0.045
b3	4.95	5.46	0.195	0.215
C	0.46	0.61	0.018	0.024
C2	0.46	0.89	0.018	0.035
D	5.97	6.22	0.235	0.245
D1	4.10	-	0.161	-
E	6.35	6.73	0.250	0.265
E1	4.32	-	0.170	-
H	9.40	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	1.01	1.52	0.040	0.060
ECN: T16-0236-Rev. P, 16-May-16 DWG: 5347				

Notes

- Dimension L3 is for reference only.

RECOMMENDED MINIMUM PADS FOR DPAK (TO-252)



Recommended Minimum Pads
Dimensions in Inches/(mm)

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