

N-Channel 100 V (D-S) MOSFET

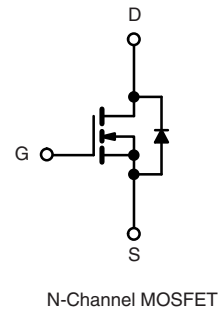
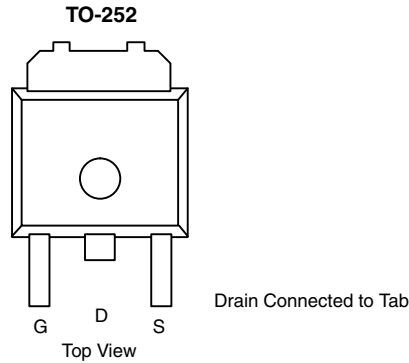
PRODUCT SUMMARY			
V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A)	Q_g (Typ)
100	0.200 at $V_{GS} = 10$ V	6.5	2.7
	0.225 at $V_{GS} = 4.5$ V	6	

FEATURES

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



RoHS
COMPLIANT
HALOGEN
FREE



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	$t \leq 10$ 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.

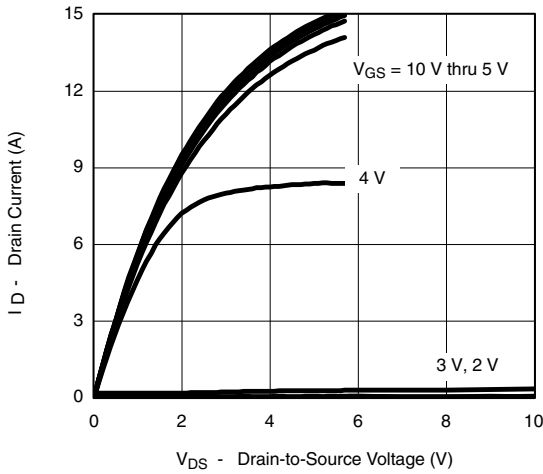
SPECIFICATIONS ($T_A = 25\text{ }^\circ\text{C}$, unless otherwise noted)						
Parameter	Symbol	Test Conditions	Min.	Typ. ^a	Max.	Unit.
Static						
Drain-Source Breakdown Voltage	V_{DS}	$V_{GS} = 0\text{ V}, I_D = 250\text{ }\mu\text{A}$	100			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$	1		3	
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}	$V_{DS} = 100\text{ V}, V_{GS} = 0\text{ V}$			1	μA
		$V_{DS} = 100\text{ V}, V_{GS} = 0\text{ V}, T_J = 125\text{ }^\circ\text{C}$			50	
On-State Drain Current ^b	$I_{D(on)}$	$V_{DS} = 5\text{ V}, V_{GS} = 10\text{ V}$	8			A
Drain-Source On-State Resistance ^b	$R_{DS(on)}$	$V_{GS} = 10\text{ V}, I_D = 3\text{ A}$		0.160	0.200	Ω
		$V_{GS} = 10\text{ V}, I_D = 3\text{ A}, T_J = 125\text{ }^\circ\text{C}$			0.350	
		$V_{GS} = 4.5\text{ V}, I_D = 1\text{ A}$		0.180	0.225	
Forward Transconductance ^b	g_{fs}	$V_{DS} = 15\text{ V}, I_D = 3\text{ A}$		8.5		S
Dynamic^a						
Input Capacitance	C_{iss}	$V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, F = 1\text{ MHz}$		240		pF
Output Capacitance	C_{oss}			42		
Reverse Transfer Capacitance	C_{rss}			17		
Total Gate Charge ^c	Q_g	$V_{DS} = 50\text{ V}, V_{GS} = 5\text{ V}, I_D = 6.5\text{ A}$		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	$t_{d(on)}$	$V_{DD} = 50\text{ V}, R_L = 7.5\text{ }\Omega$ $I_D \cong 6.5\text{ A}, V_{GEN} = 10\text{ V}, R_g = 2.5\text{ }\Omega$		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 ($T_C = 25\text{ }^\circ\text{C}$)						
Pulsed Current	I_{SM}				8	A
Diode Forward Voltage ^b	V_{SD}	$I_F = 6.5\text{ A}, V_{GS} = 0\text{ V}$		0.9	1.3	V
Source-Drain Reverse Recovery Time	t_{rr}	$I_F = 6.5\text{ A}, di/dt = 100\text{ A}/\mu\text{s}$		35	60	ns

Notes:

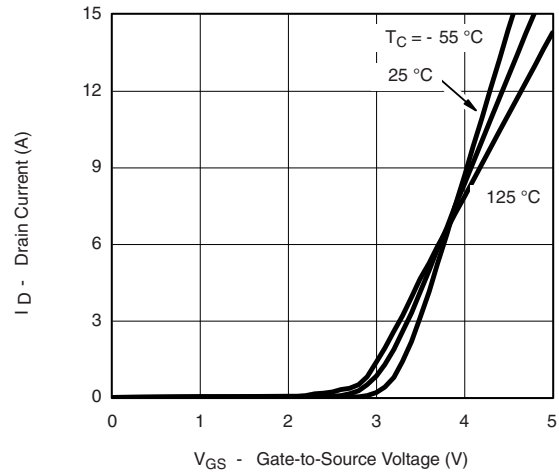
- Guaranteed by design, not subject to production testing.
- Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.
- Independent of operating temperature.

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.

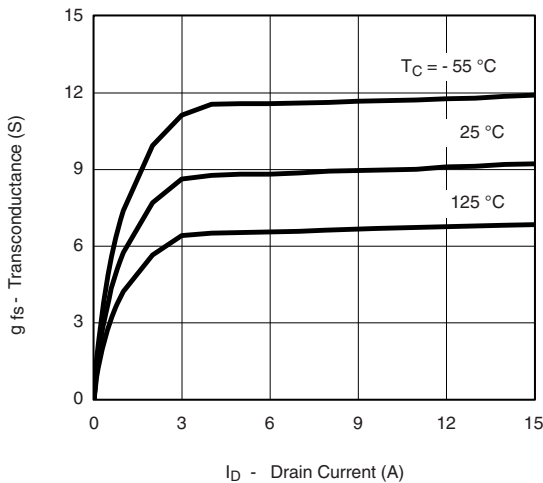
TYPICAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$, unless otherwise noted)



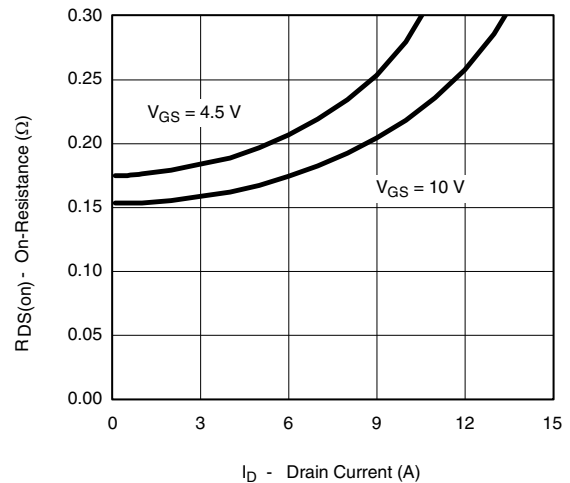
Output Characteristics



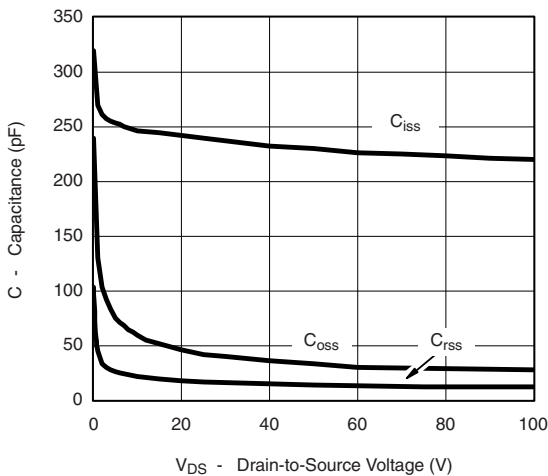
Transfer Characteristics



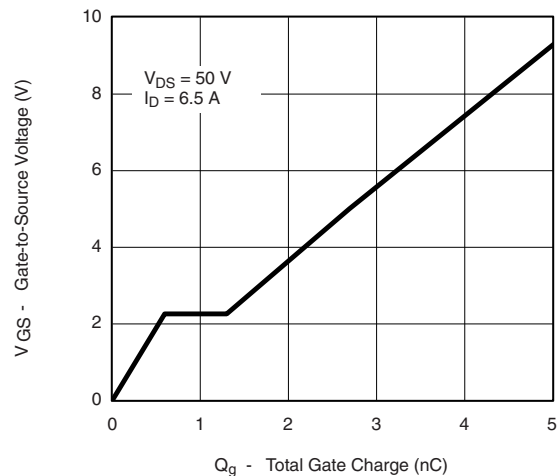
Transconductance



On-Resistance vs. Drain Current

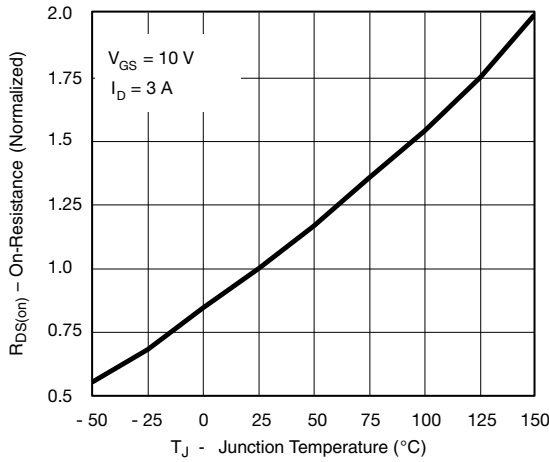


Capacitance

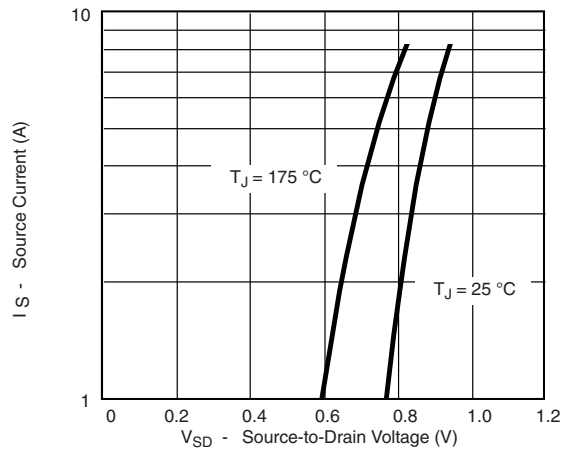


Gate Charge

TYPICAL CHARACTERISTICS $(T_A = 25\text{ }^\circ\text{C}, \text{ unless otherwise noted})$

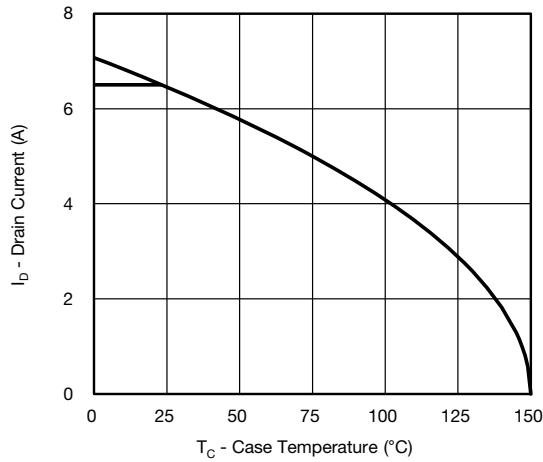


On-Resistance vs. Junction Temperature

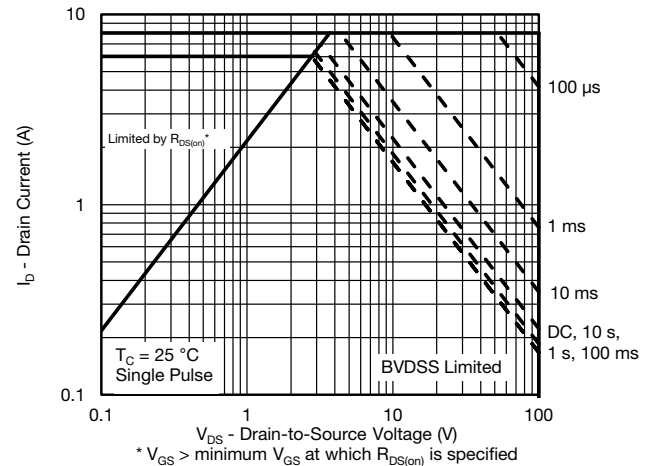


Source-Drain Diode Forward Voltage

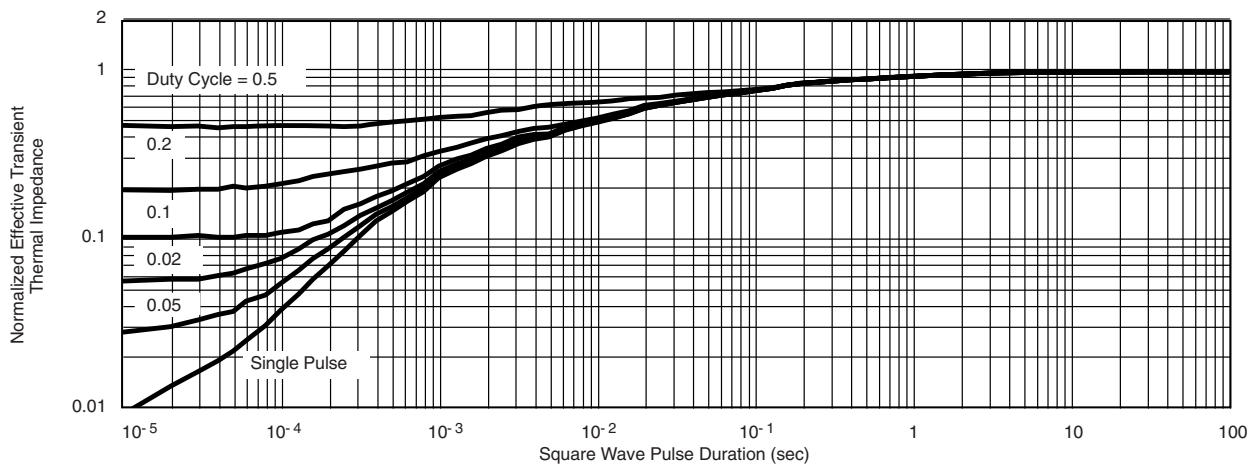
THERMAL RATINGS



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



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°
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

RECOMMENDED MINIMUM PADS FOR DPAK (TO-252)



Recommended Minimum Pads
Dimensions in Inches/(mm)

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