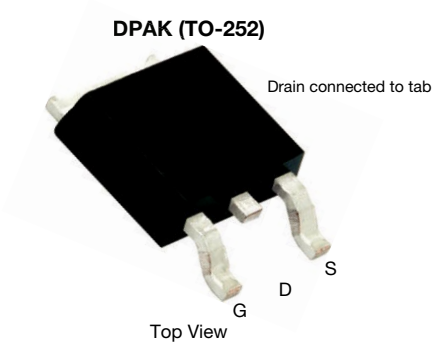
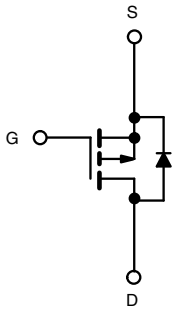
P-Channel 60 V (D-S) MOSFET



FEATURES

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

RoHS COMPLIANT
HALOGEN FREE



P-Channel MOSFET

PRODUCT SUMMARY	
V_{DS} (V)	-60
$R_{DS(on)}$ max. (Ω) at V_{GS} = -10 V	0.155
$R_{DS(on)}$ max. (Ω) at V_{GS} = -4.5 V	0.280
Q_g typ. (nC)	12.5
I_D (A)	-8.4
Configuration	Single

ORDERING INFORMATION	
Package	DPAK (TO-252)
Lead (Pb)-free and halogen-free	SUD08P06-155L-GE3

ABSOLUTE MAXIMUM RATINGS (T_C = 25 °C, unless otherwise noted)

PARAMETER		SYMBOL	LIMIT	UNIT
Gate-source voltage		V_{GS}	± 20	V
Continuous drain current (T_J = 150 °C)	T_C = 25 °C	I_D	-8.2	A
	T_C = 100 °C		-5.2	
Pulsed drain current		I_{DM}	-18	
Continuing source current (diode conduction)		I_S	-8.4	
Avalanche current		I_{AS}	-12	
Single pulse avalanche energy	L = 0.1 mH	E_{AS}	7.2	mJ
Maximum power dissipation	T_C = 25 °C	P_D	20.8 [a]	W
	T_A = 25 °C		1.7 [b]	
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 [b]	t ≤ 10 s	R_{thJA}	20	25	°C/W
	Steady state		62	75	
Junction-to-case		R_{thJC}	5	6	

Notes

a. See SOA curve for voltage derating
b. Surface mounted on 1" x 1" FR-4 board

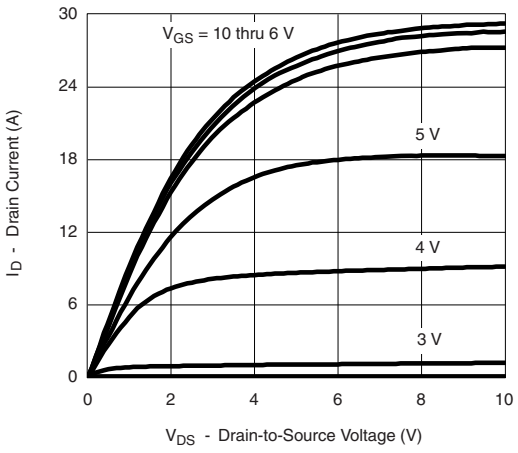
SPECIFICATIONS (T_J = 25 °C, unless otherwise noted)						
PARAMETER	**SYMBOL**	**TEST CONDITIONS**	**MIN.**	**TYP. [a]**	**MAX.**	**UNIT**
Static						
Drain-source breakdown voltage	V_{DS}	V_{GS} = 0 V, I_D = -250 µA	-60	-	-	V
Gate threshold voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = -250 µA	-1	-2	-	
Gate-body leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ± 20 V	-	-	± 100	nA
Zero gate voltage drain current	I_{DSS}	V_{DS} = -60 V, V_{GS} = 0 V	-	-	-1	µA
		V_{DS} = -60 V, V_{GS} = 0 V, T_J = 125 °C	-	-	-50	
		V_{DS} = -60 V, V_{GS} = 0 V, T_J = 150 °C	-	-	-150	
On-state drain current [b]	$I_{D(on)}$	V_{DS} = -5 V, V_{GS} = -10 V	-10	-	-	A
Drain-source on-state resistance [b]	$R_{DS(on)}$	V_{GS} = -10 V, I_D = -5 A	-	0.125	0.155	Ω
		V_{GS} = -10 V, I_D = -5 A, T_J = 125 °C	-	-	0.280	
		V_{GS} = -10 V, I_D = -5 A, T_J = 150 °C	-	-	0.350	
		V_{GS} = -4.5 V, I_D = -2 A	-	0.158	0.280	
Forward transconductance [b]	g_{fs}	V_{DS} = -15 V, I_D = -5 A	-	8	-	S
Dynamic						
Input capacitance	C_{iss}	V_{DS} = -25 V, V_{GS} = 0 V, f = 1 MHz	-	450	-	pF
Output capacitance	C_{oss}		-	65	-	
Reverse transfer capacitance	C_{rss}		-	40	-	
Total gate charge	Q_g	V_{DS} = -30 V, V_{GS} = -10 V, I_D = -8.4 A	-	12.5	19	nC
Gate-source charge	Q_{gs}		-	2.3	-	
Gate-drain charge	Q_{gd}		-	3.2	-	
Gate resistance	R_g	f = 1 MHz	-	8	-	Ω
Turn-on delay time [c]	$t_{d(on)}$	V_{DD} = -30 V, R_L = 3.57 Ω $I_D \cong$ -8.4 A, V_{GEN} = -10 V, R_g = 2.5 Ω	-	5	10	ns
Rise time [c]	t_r		-	14	25	
Turn-off delay time [c]	$t_{d(off)}$		-	15	25	
Fall time [c]	t_f		-	7	12	
Source-Drain Diode Ratings and Characteristics (T_C = 25 °C) [b]						
Pulsed current	I_{SM}		-	-	-20	A
Forward voltage [b]	V_{SD}	I_F = -2 A, V_{GS} = 0 V	-	-0.9	-1.3	V
Reverse recovery time	t_{rr}	I_F = -8 A, di/dt = 100 A/µs	-	50	80	ns
Reverse recovery time	Q_{rr}		-	80	120	nC

Notes

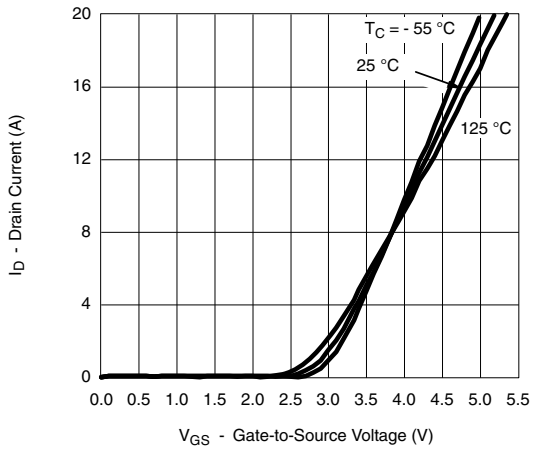
a. Guaranteed by design, not subject to production testing
b. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2 %
c. Independent of operating temperature

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.

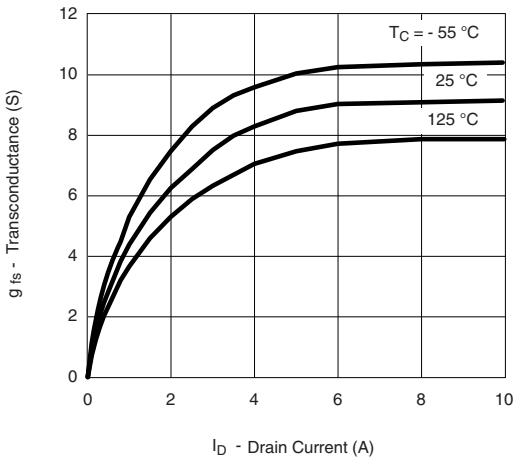
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



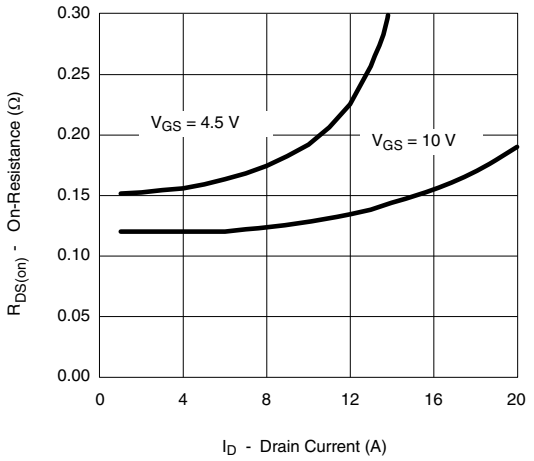
Output Characteristics



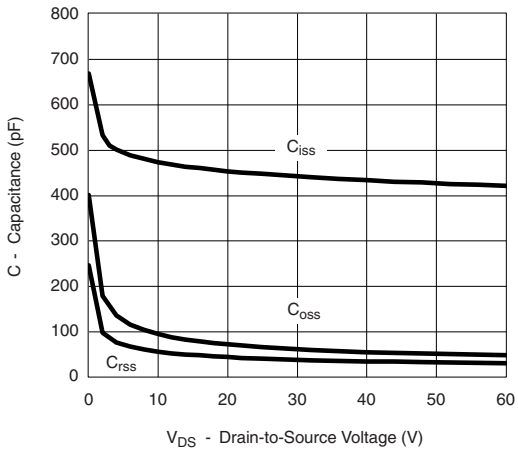
Transfer Characteristics



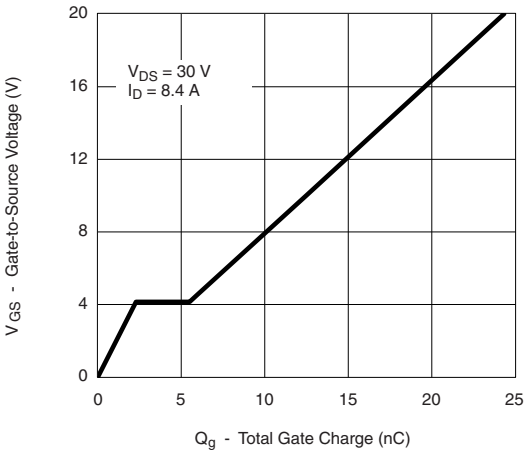
Transconductance



On-Resistance vs. Drain Current

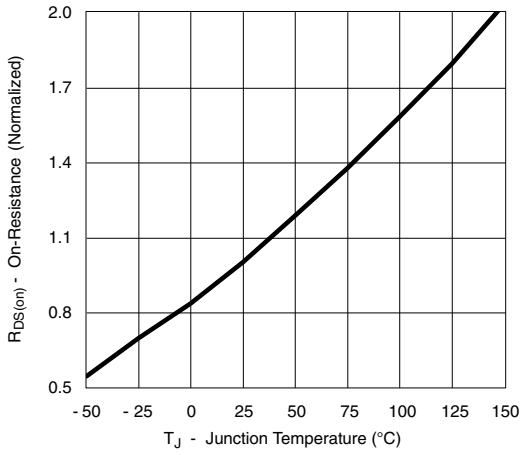


Capacitance

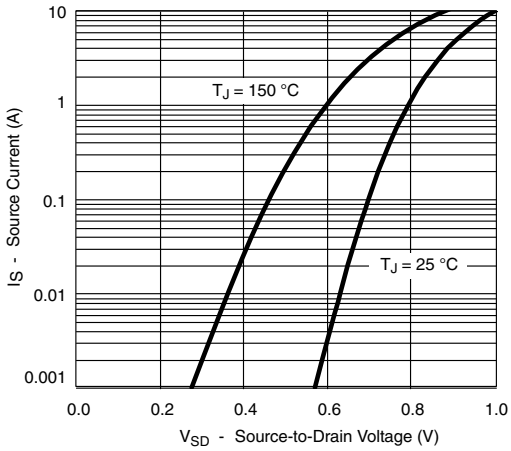


Gate Charge

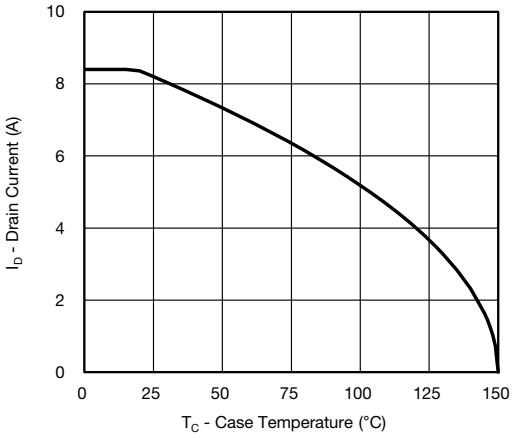
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



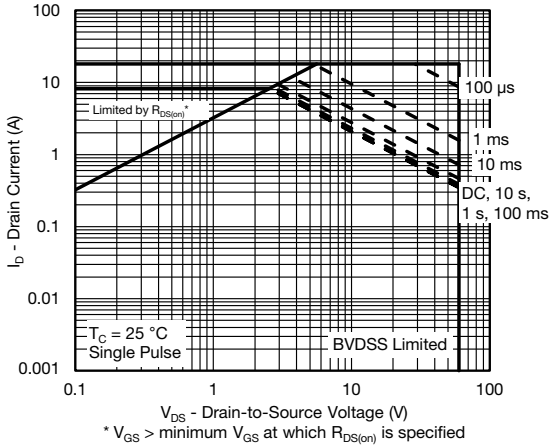
On-Resistance vs. Junction Temperature



Source-Drain Diode Forward Voltage

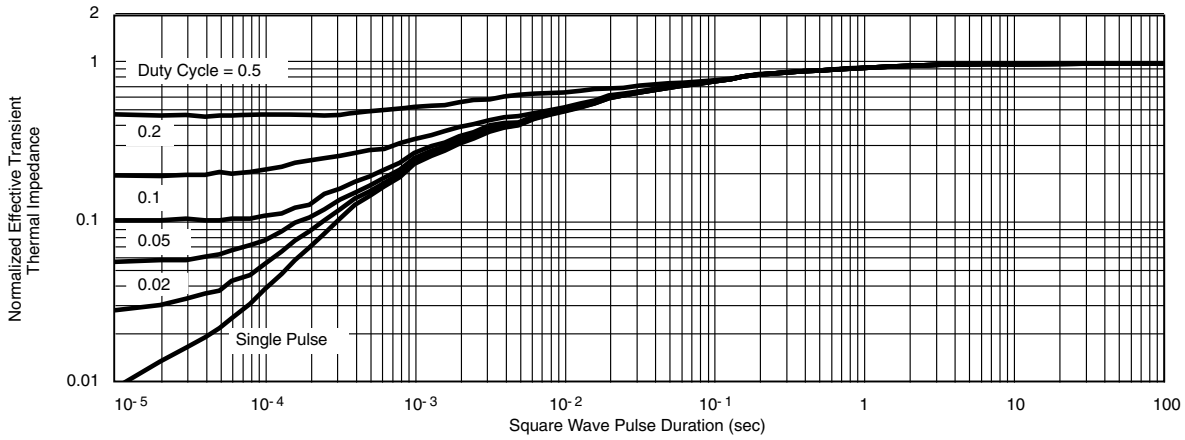


Drain Current vs. Case Temperature



Safe Operating Area

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

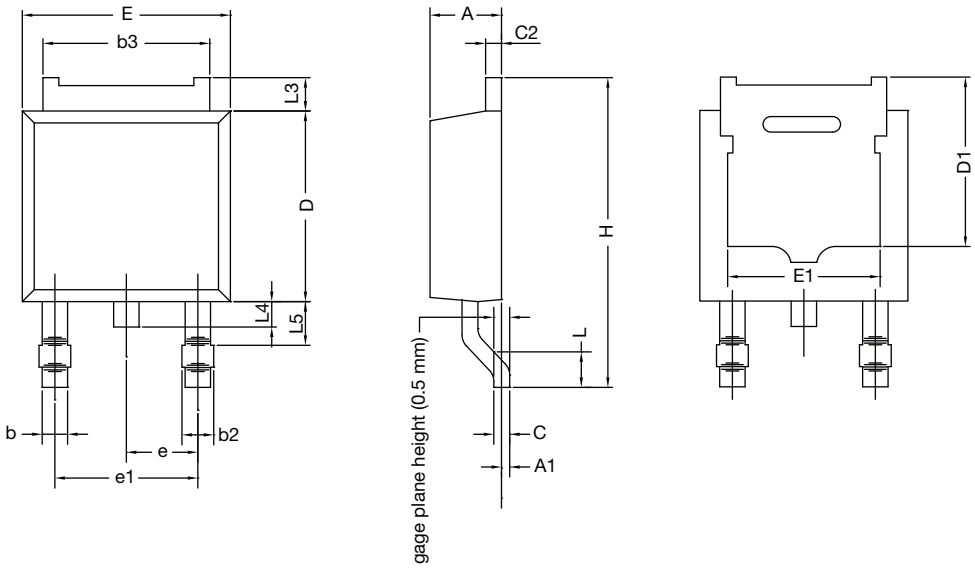


Normalized Thermal Transient Impedance, Junction-to-Case

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?62843.

TO-252AA Case Outline

VERSION 1: FACILITY CODE = Y

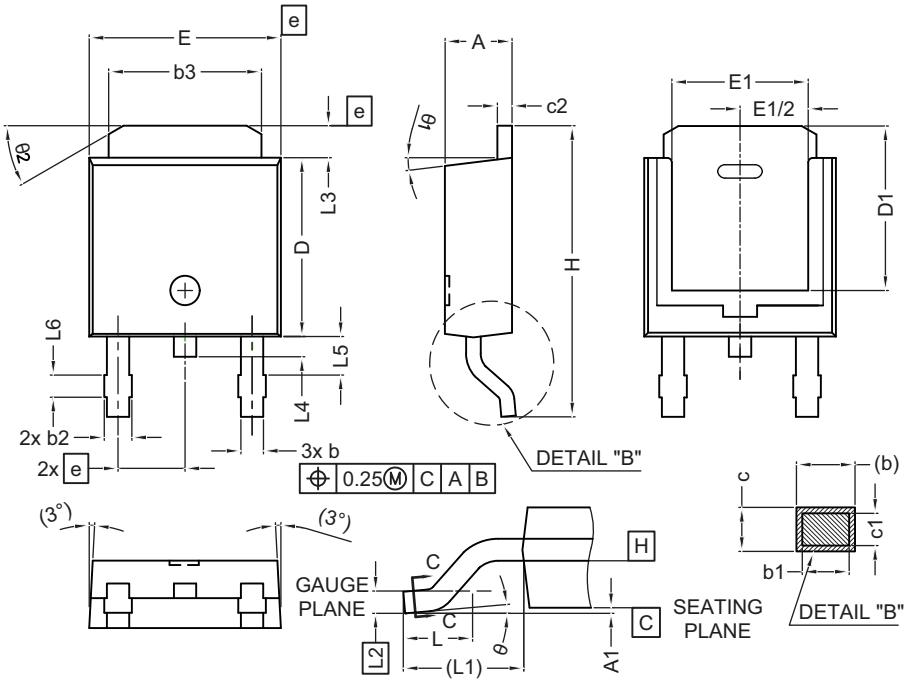


	MILLIMETERS	
DIM.	MIN.	MAX.
A	2.18	2.38
A1	-	0.127
b	0.64	0.88
b2	0.76	1.14
b3	4.95	5.46
C	0.46	0.61
C2	0.46	0.89
D	5.97	6.22
D1	4.10	-
E	6.35	6.73
E1	4.32	-
H	9.40	10.41
e	2.28 BSC	
e1	4.56 BSC	
L	1.40	1.78
L3	0.89	1.27
L4	-	1.02
L5	1.01	1.52

Note

- Dimension L3 is for reference only

VERSION 2: FACILITY CODE = N



	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

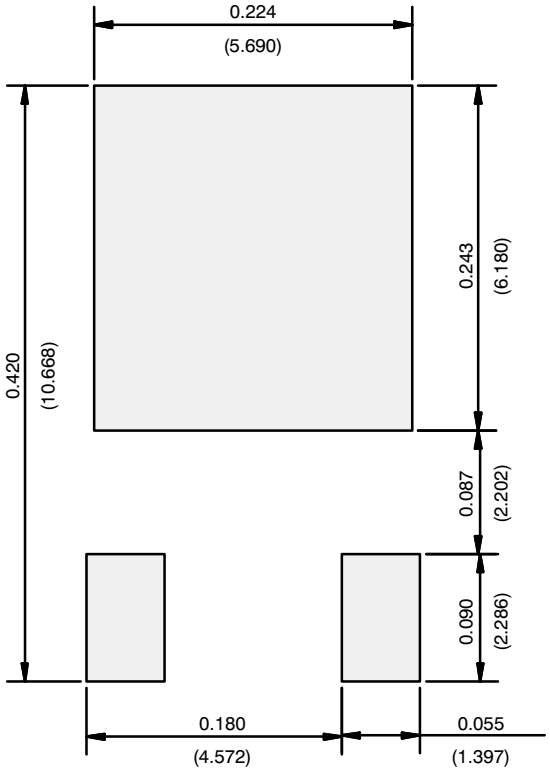
	MILLIMETERS	
DIM.	MIN.	MAX.
L	1.50	1.78
L1	2.74 ref.	
L2	0.51 BSC	
L3	0.89	1.27
L4	-	1.02
L5	1.14	1.49
L6	0.65	0.85
θ	0°	10°
θ1	0°	15°
θ2	25°	35°

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: E19-0649-Rev. Q, 16-Dec-2019
DWG: 5347

RECOMMENDED MINIMUM PADS FOR DPAK (TO-252)



Recommended Minimum Pads
Dimensions in Inches/(mm)

Return to Index

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