P-Channel 30 V (D-S) MOSFET

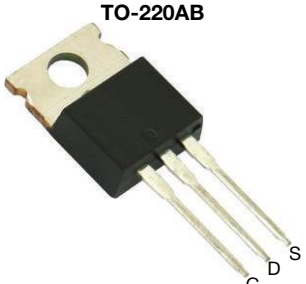
PRODUCT SUMMARY			
V_{DS} (V)	$R_{DS(on)}$ (Ω) MAX.	I_D (A) [d]	Q_g (TYP.)
-30	0.0087 at V_{GS} = -10 V	-45	60
	0.0150 at V_{GS} = -4.5 V	-45	

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

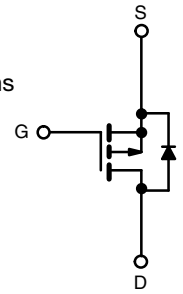
TO-220AB



Top View

APPLICATIONS

- Power switch
- Load switch in high current applications
- DC/DC converters



P-Channel MOSFET

Ordering Information:
SUP45P03-09-GE3 (lead (Pb)-free and halogen-free)

ABSOLUTE MAXIMUM RATINGS (T_C = 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 (T_J = 150 °C) [d]	T_C = 25 °C	I_D	-45	A
	T_C = 70 °C		-45	
Pulsed Drain Current (t = 100 µs)		I_{DM}	-100	
Avalanche Current	L = 0.1 mH	I_{AS}	-35	
Single Avalanche Energy [a]		E_{AS}	61	mJ
Maximum Power Dissipation [a]	T_C = 25 °C	P_D	73.5 [b]	W
	T_A = 25 °C [c]		3.1	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55 to +150	°C

THERMAL RESISTANCE RATINGS			
PARAMETER	SYMBOL	LIMIT	UNIT
Junction-to-Ambient (PCB Mount) [c]	R_{thJA}	40	°C/W
Junction-to-Case (Drain)	R_{thJC}	1.7	

Notes
a. Duty cycle ≤ 1 %.
b. See SOA curve for voltage derating.
c. When mounted on 1" square PCB (FR4 material).
d. Package limited.

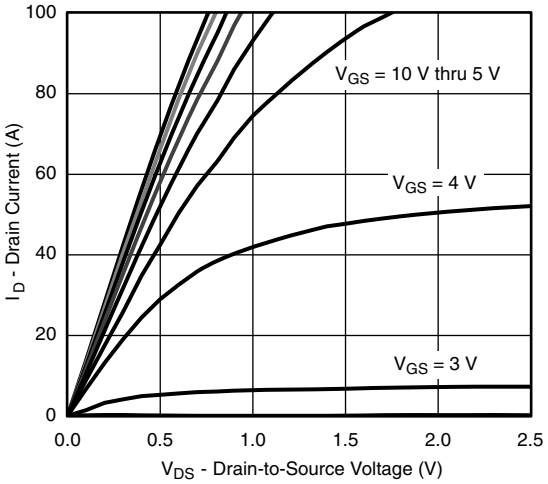
SPECIFICATIONS (T_J = 25 °C, unless otherwise noted)						
PARAMETER	**SYMBOL**	**TEST CONDITIONS**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
Static						
Drain-Source Breakdown Voltage	V_{DS}	V_{GS} = 0 V, I_D = -250 µA	-30	-	-	V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = -250 µA	-1	-	-2.5	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ± 20 V	-	-	± 250	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = -30 V, V_{GS} = 0 V	-	-	-1	µA
		V_{DS} = -30 V, V_{GS} = 0 V, T_J = 125 °C	-	-	-50	
		V_{DS} = -30 V, V_{GS} = 0 V, T_J = 150 °C	-	-	-250	
On-State Drain Current [a]	$I_{D(on)}$	V_{DS} ≤ -10 V, V_{GS} = -10 V	-50	-	-	A
Drain-Source On-State Resistance [a]	$R_{DS(on)}$	V_{GS} = -10 V, I_D = -20 A	-	0.0072	0.0087	Ω
		V_{GS} = -4.5 V, I_D = -15 A	-	0.0125	0.0150	
Forward Transconductance [a]	g_{fs}	V_{DS} = -15 V, I_D = -20 A	-	45	-	S
Dynamic [b]						
Input Capacitance	C_{iss}	V_{GS} = 0 V, V_{DS} = -15 V, f = 1 MHz	-	2700	-	pF
Output Capacitance	C_{oss}		-	515	-	
Reverse Transfer Capacitance	C_{rss}		-	445	-	
Total Gate Charge [c]	Q_g	V_{DS} = -15 V, V_{GS} = -10 V, I_D = -20 A	-	60	90	nC
Gate-Source Charge [c]	Q_{gs}		-	9.3	-	
Gate-Drain Charge [c]	Q_{gd}		-	15	-	
Gate Resistance	R_g	f = 1 MHz	0.5	2.5	5	Ω
Turn-On Delay Time [c]	$t_{d(on)}$	V_{DD} = -15 V, R_L = 1.5 Ω I_D ≅ -10 A, V_{GEN} = -10 V, R_g = 1 Ω	-	12	20	ns
Rise Time [c]	t_r		-	11	20	
Turn-Off Delay Time [c]	$t_{d(off)}$		-	40	60	
Fall Time [c]	t_f		-	12	20	
Drain-Source Body Diode Ratings and Characteristics [b] (T_C = 25 °C)						
Continuous Current	I_S		-	-	-45	A
Pulsed Current (t = 100 µs)	I_{SM}		-	-	-100	
Forward Voltage [a]	V_{SD}	I_F = -10 A, V_{GS} = 0 V	-	-0.8	-1.5	V
Reverse Recovery Time	t_{rr}	I_F = -10 A, dI/dt = 100 A/µs	-	27	40	ns
Peak Reverse Recovery Current	$I_{RM(REC)}$		-	1.3	2	A
Reverse Recovery Charge	Q_{rr}		-	20	30	nC

Notes

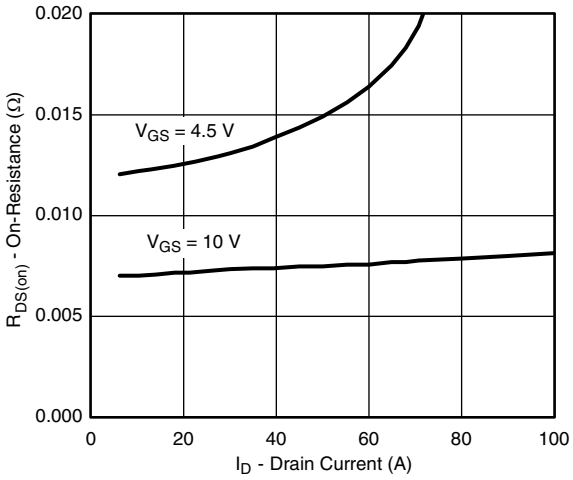
a. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2 %.
b. Guaranteed by design, not subject to production testing.
c. Independent of operating temperature.

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.

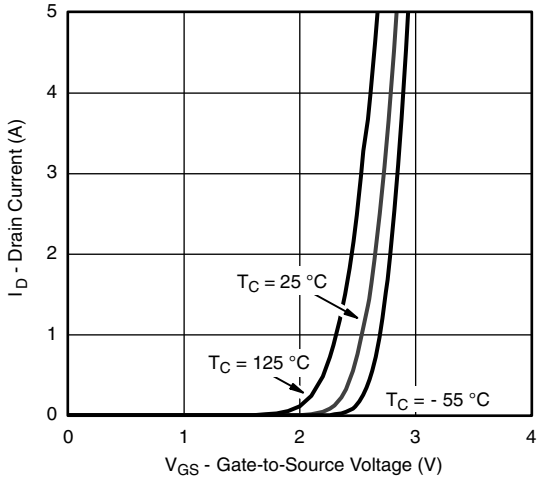
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



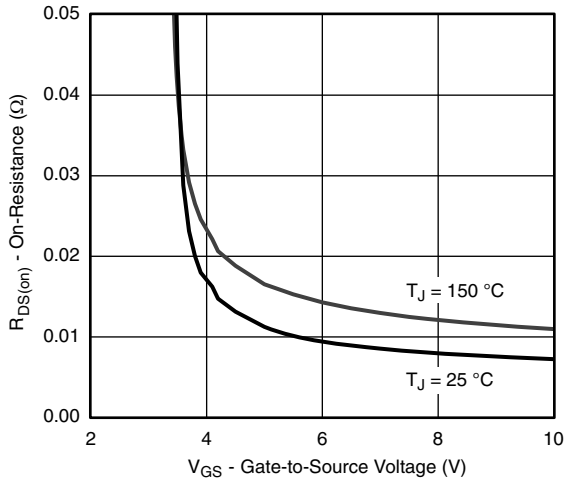
Output Characteristics



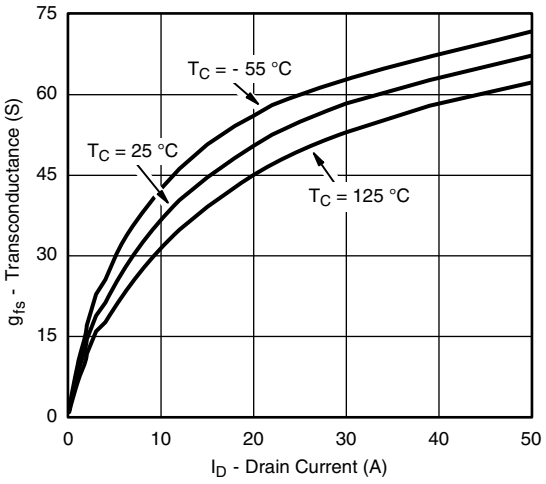
On-Resistance vs. Drain Current



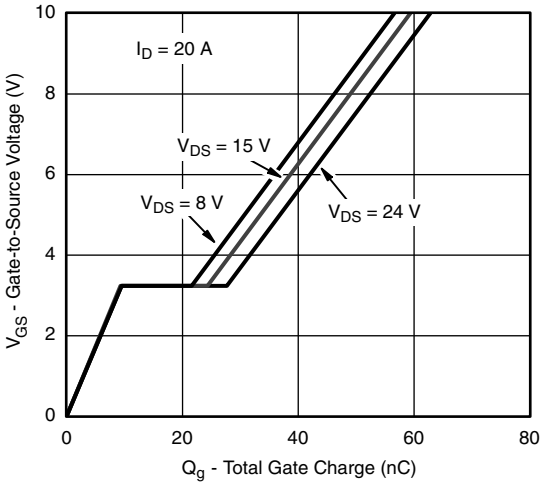
Transfer Characteristic



On-Resistance vs. Gate-to-Source Voltage

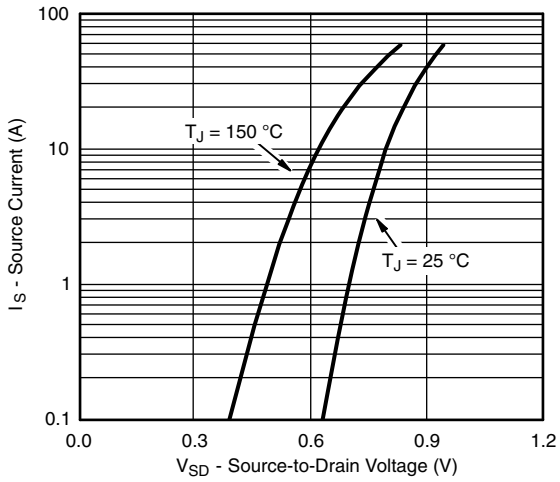


Transconductance

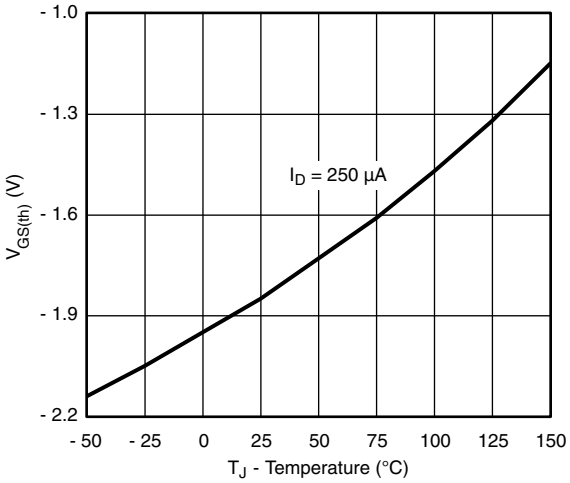


Gate Charge

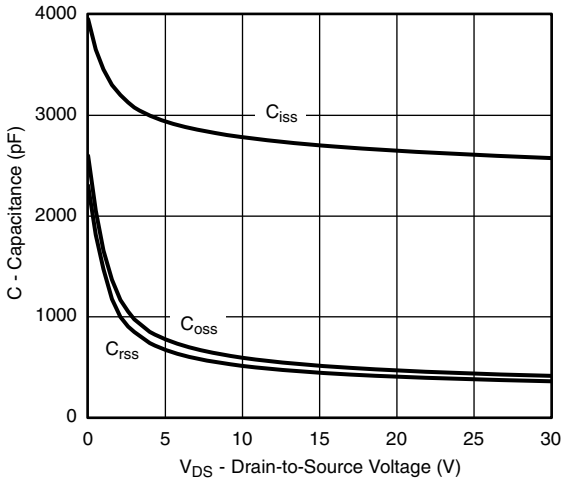
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



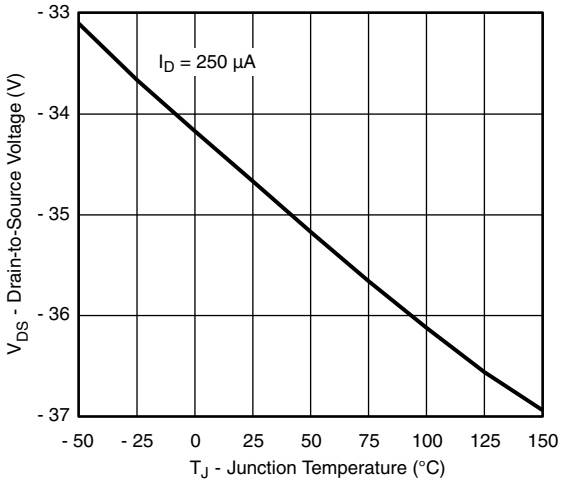
Source-Drain Diode Forward Voltage



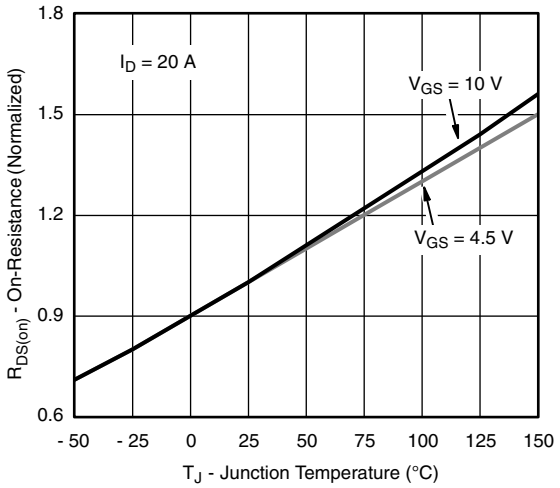
Threshold Voltage



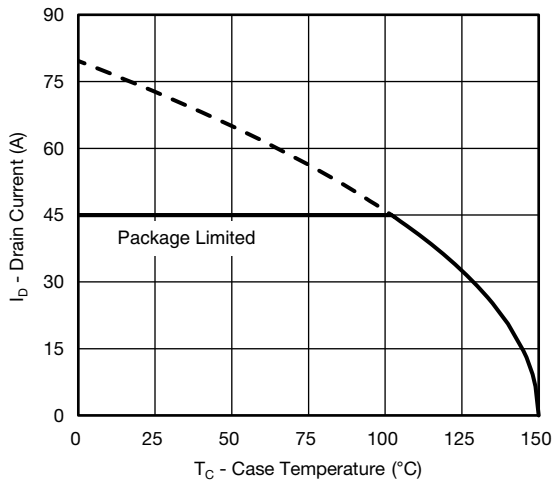
Capacitance



Drain Source Breakdown vs. Junction Temperature

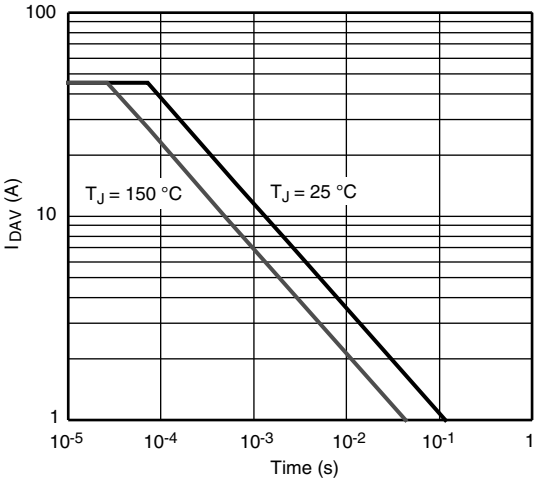


On-Resistance vs. Junction Temperature

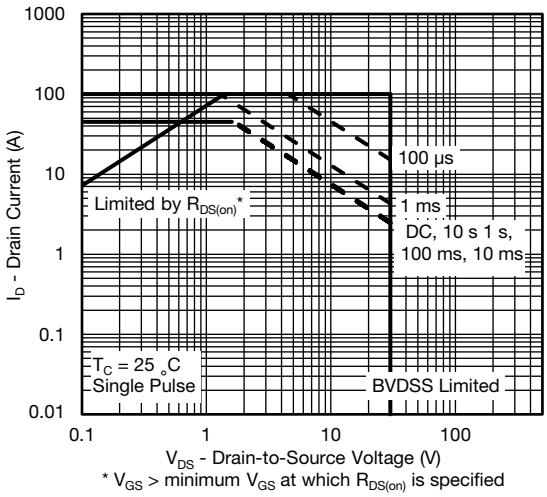


Current Derating

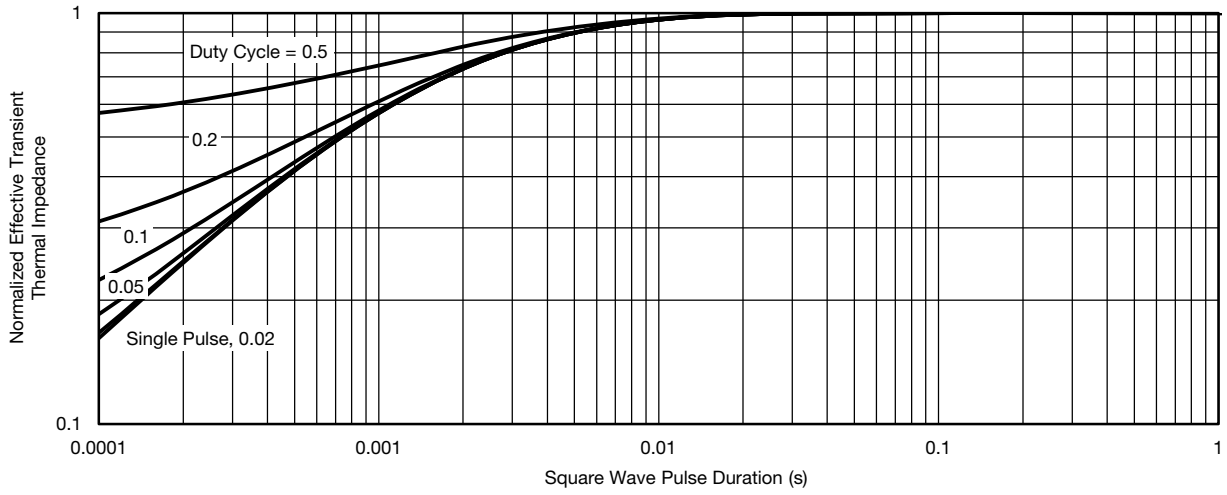
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



Single Pulse Avalanche Current Capability vs. Time



Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Case

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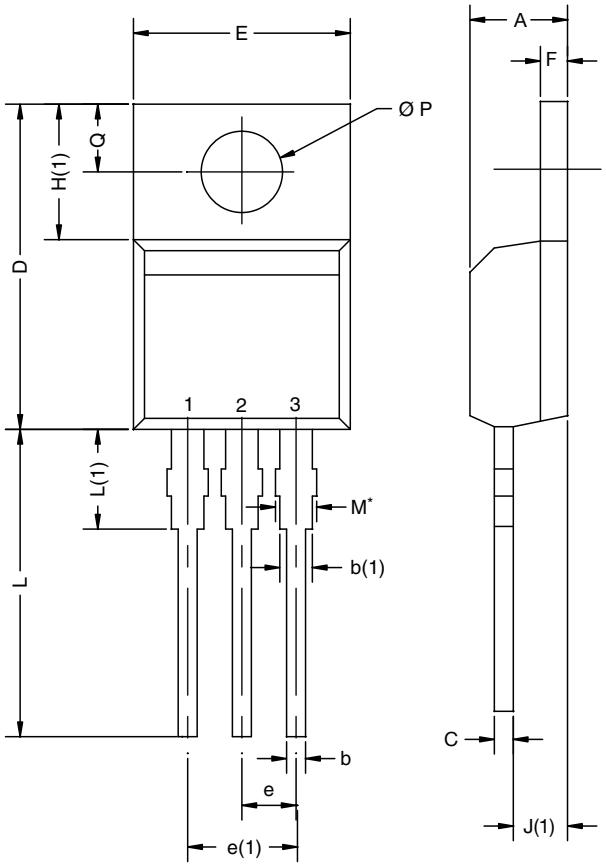

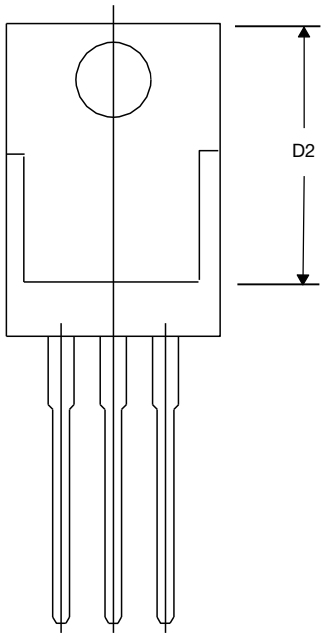

DIM.	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	4.25	4.65	0.167	0.183
b	0.69	1.01	0.027	0.040
b(1)	1.20	1.73	0.047	0.068
c	0.36	0.61	0.014	0.024
D	14.85	15.49	0.585	0.610
D2	12.19	12.70	0.480	0.500
E	10.04	10.51	0.395	0.414
e	2.41	2.67	0.095	0.105
e(1)	4.88	5.28	0.192	0.208
F	1.14	1.40	0.045	0.055
H(1)	6.09	6.48	0.240	0.255
J(1)	2.41	2.92	0.095	0.115
L	13.35	14.02	0.526	0.552
L(1)	3.32	3.82	0.131	0.150
Ø P	3.54	3.94	0.139	0.155
Q	2.60	3.00	0.102	0.118
ECN: T14-0413-Rev. P, 16-Jun-14 DWG: 5471				

Note

* M = 1.32 mm to 1.62 mm (dimension including protrusion) Heatsink hole for HVM

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