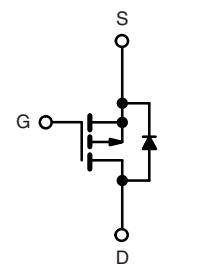
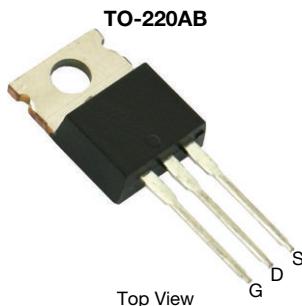


Automotive P-Channel 60 V (D-S) 175 °C MOSFET

PRODUCT SUMMARY	
V _{DS} (V)	-60
R _{DS(on)} (Ω) at V _{GS} = -10 V	0.0067
R _{DS(on)} (Ω) at V _{GS} = -4.5 V	0.0088
I _D (A)	-120
Configuration	Single

FEATURES

- TrenchFET® power MOSFET
- Package with low thermal resistance
- AEC-Q101 qualified ^d
- 100 % R_g and UIS tested
- Material categorization:
For definitions of compliance please see
www.vishay.com/doc?99912



ORDERING INFORMATION

Package	TO-220
Lead (Pb)-free and Halogen-free	SQP90P06-07L-GE3

ABSOLUTE MAXIMUM RATINGS (T _C = 25 °C, unless otherwise noted)			
PARAMETER	SYMBOL	LIMIT	UNIT
Drain-Source Voltage	V _{DS}	-60	V
Gate-Source Voltage	V _{GS}	± 20	
Continuous Drain Current ^a	T _C = 25 °C ^a	I _D	A
	T _C = 125 °C	-120	
Continuous Source Current (Diode Conduction) ^a	I _S	-120	
	I _{DM}	-480	
Single Pulse Avalanche Current	I _{AS}	-80	mJ
Single Pulse Avalanche Energy	E _{AS}	320	
Maximum Power Dissipation ^b	T _C = 25 °C	P _D	W
	T _C = 125 °C	300	
Operating Junction and Storage Temperature Range	100	T _J , T _{stg}	°C
		-55 to +175	

THERMAL RESISTANCE RATINGS			
PARAMETER	SYMBOL	LIMIT	UNIT
Junction-to-Ambient	R _{thJA}	40	°C/W
Junction-to-Case (Drain)	R _{thJC}	0.5	

Notes

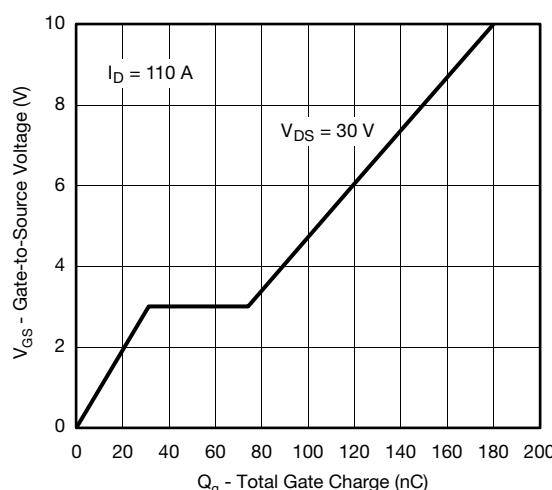
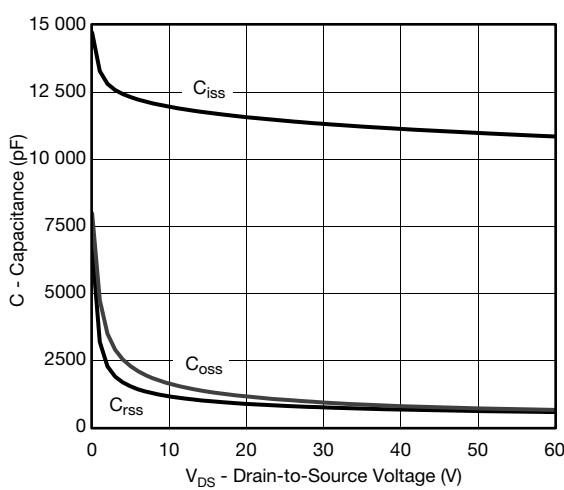
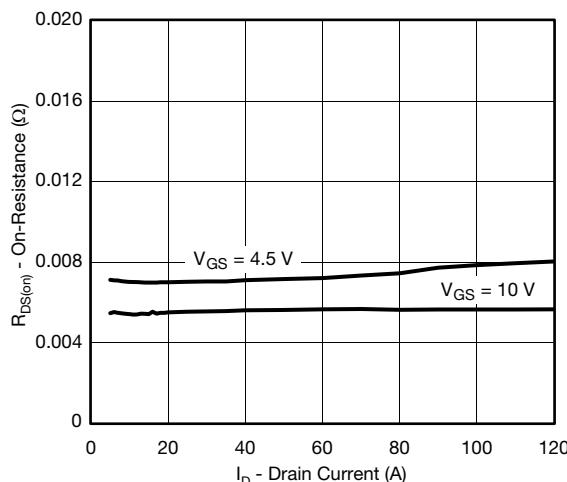
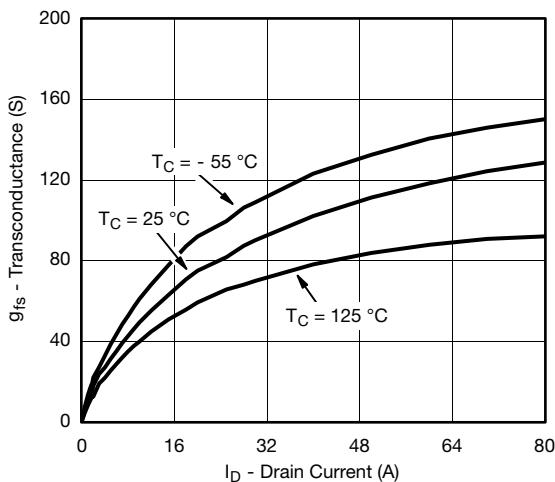
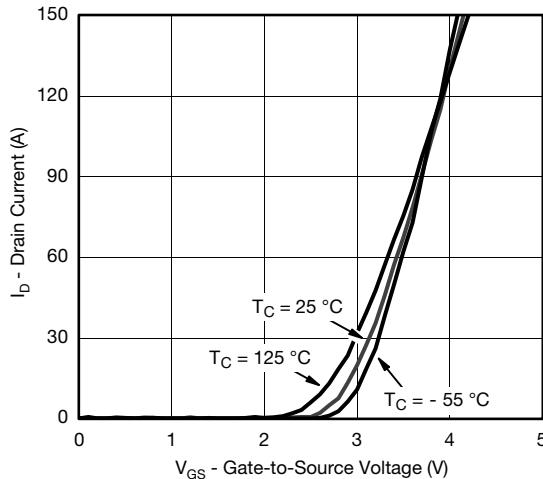
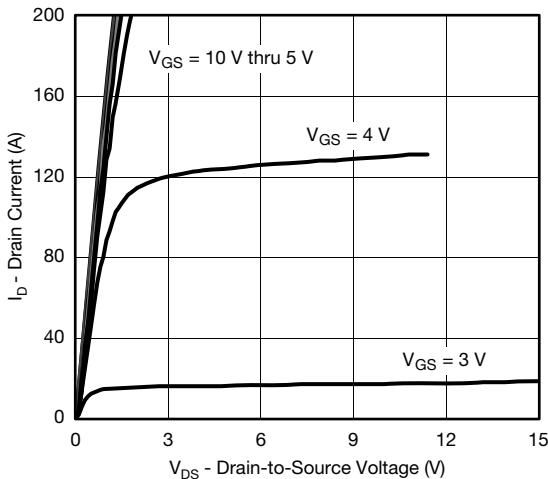
- Package limited.
- Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2 %.
- When mounted on 1" square Pcb (Fr-4 material).
- Parametric verification ongoing.

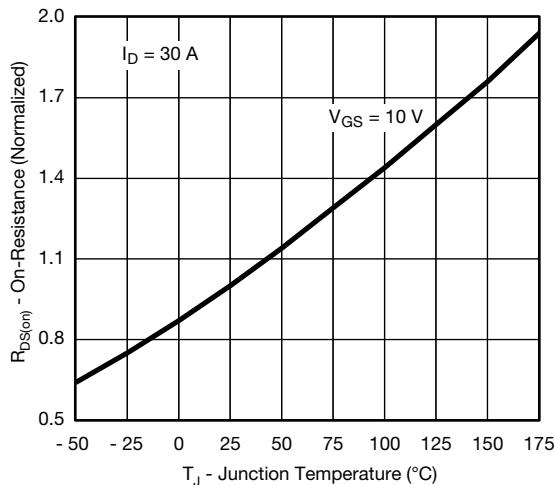
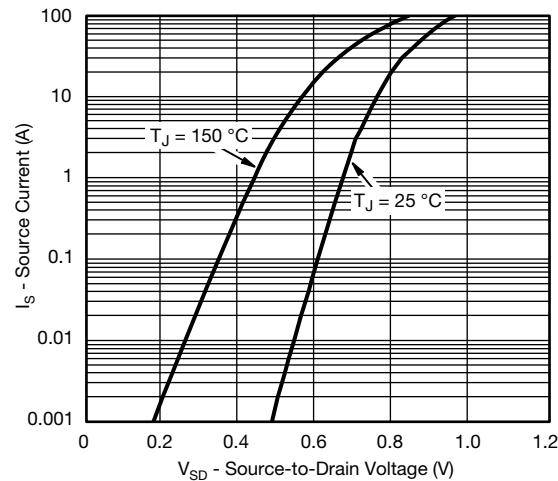
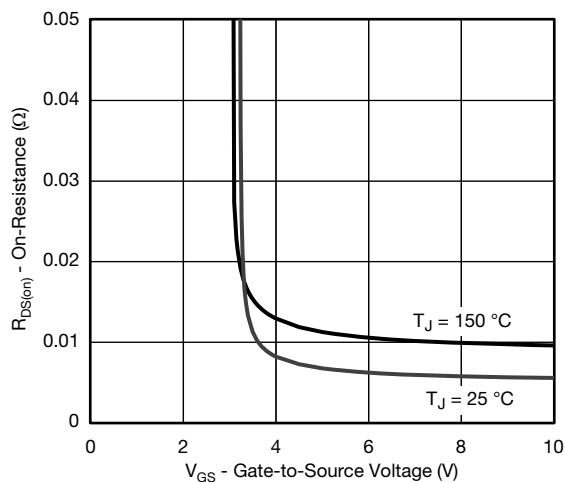
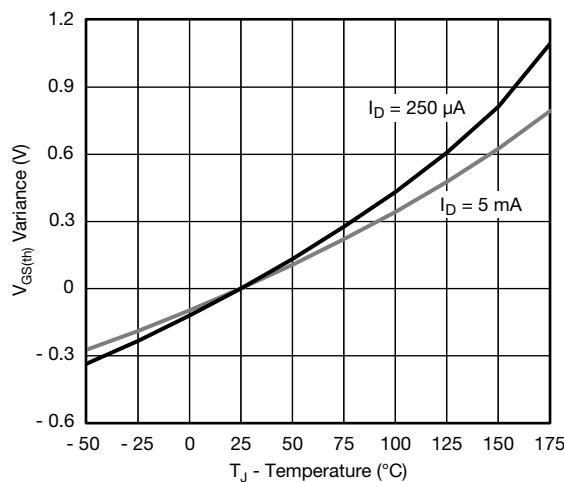
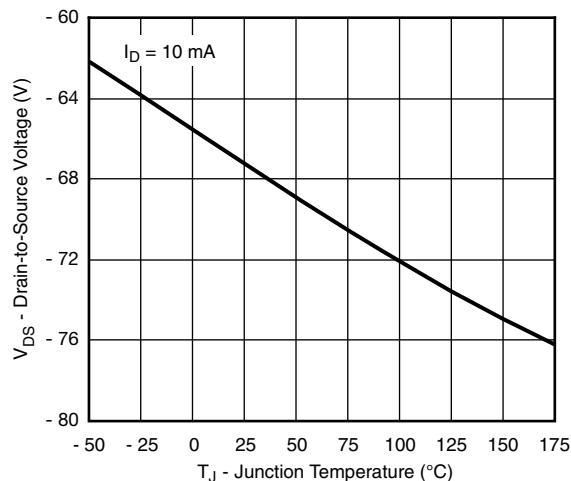
SPECIFICATIONS ($T_C = 25^\circ\text{C}$, unless otherwise noted)								
PARAMETER	SYMBOL	TEST CONDITIONS		MIN.	TYP.	MAX.	UNIT	
Static								
Drain-Source Breakdown Voltage	V_{DS}	$V_{GS} = 0$, $I_D = -250 \mu\text{A}$		-60	-	-	V	
Gate-Source Threshold Voltage	$V_{GS(\text{th})}$	$V_{DS} = V_{GS}$, $I_D = -250 \mu\text{A}$		-1.5	-2.0	-2.5		
Gate-Source Leakage	I_{GSS}	$V_{DS} = 0 \text{ V}$, $V_{GS} = \pm 20 \text{ V}$		-	-	± 100	nA	
Zero Gate Voltage Drain Current	I_{DSS}	$V_{GS} = 0 \text{ V}$	$V_{DS} = -60 \text{ V}$	-	-	-1	μA	
		$V_{GS} = 0 \text{ V}$	$V_{DS} = -60 \text{ V}$, $T_J = 125^\circ\text{C}$	-	-	-50		
		$V_{GS} = 0 \text{ V}$	$V_{DS} = -60 \text{ V}$, $T_J = 175^\circ\text{C}$	-	-	-250		
On-State Drain Current ^a	$I_{D(\text{on})}$	$V_{GS} = -10 \text{ V}$	$V_{DS} \leq -5 \text{ V}$	-120	-	-	A	
Drain-Source On-State Resistance ^a	$R_{DS(\text{on})}$	$V_{GS} = -10 \text{ V}$	$I_D = -30 \text{ A}$	-	0.0056	0.0067	Ω	
		$V_{GS} = -10 \text{ V}$	$I_D = -30 \text{ A}$, $T_J = 125^\circ\text{C}$	-	-	0.0110		
		$V_{GS} = -10 \text{ V}$	$I_D = -30 \text{ A}$, $T_J = 175^\circ\text{C}$	-	-	0.0130		
		$V_{GS} = -4.5 \text{ V}$	$I_D = -20 \text{ A}$	-	0.0070	0.0088		
Forward Transconductance ^b	g_{fs}	$V_{DS} = -15 \text{ V}$, $I_D = -30 \text{ A}$		-	90	-	S	
Dynamic ^b								
Input Capacitance	C_{iss}	$V_{GS} = 0 \text{ V}$	$V_{DS} = -25 \text{ V}$, $f = 1 \text{ MHz}$	-	11 423	14 280	pF	
Output Capacitance	C_{oss}			-	1034	1295		
Reverse Transfer Capacitance	C_{rss}			-	809	1015		
Total Gate Charge ^c	Q_g	$V_{GS} = -10 \text{ V}$	$V_{DS} = -30 \text{ V}$, $I_D = -110 \text{ A}$	-	180	270	nC	
Gate-Source Charge ^c	Q_{gs}			-	31	-		
Gate-Drain Charge ^c	Q_{gd}			-	43	-		
Gate Resistance	R_g	$f = 1 \text{ MHz}$		1.1	2.27	3.5	Ω	
Turn-On Delay Time ^c	$t_{d(\text{on})}$	$V_{DD} = -30 \text{ V}$, $R_L = 0.27 \Omega$ $I_D \approx -110 \text{ A}$, $V_{GEN} = -10 \text{ V}$, $R_g = 1 \Omega$		-	15	23	ns	
Rise Time ^c	t_r			-	23	35		
Turn-Off Delay Time ^c	$t_{d(\text{off})}$			-	97	146		
Fall Time ^c	t_f			-	32	48		
Source-Drain Diode Ratings and Characteristics ^b								
Pulsed Current ^a	I_{SM}			-	-	-480	A	
Forward Voltage	V_{SD}	$I_F = -100 \text{ A}$, $V_{GS} = 0$		-	-0.95	-1.5	V	

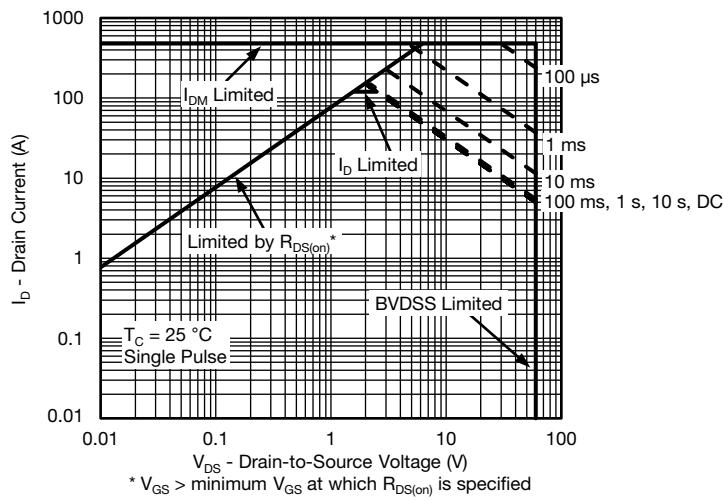
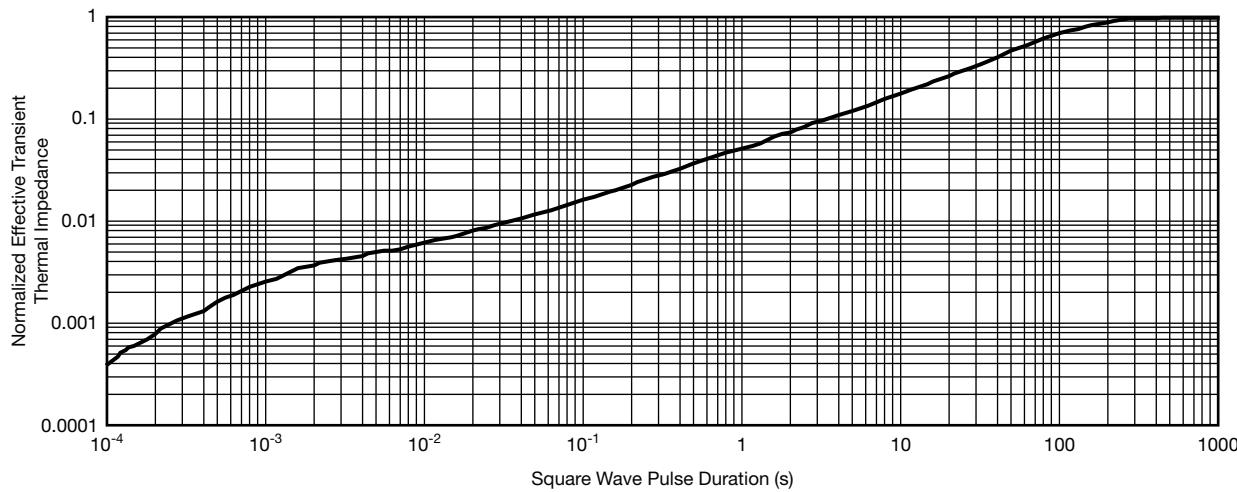
Notes

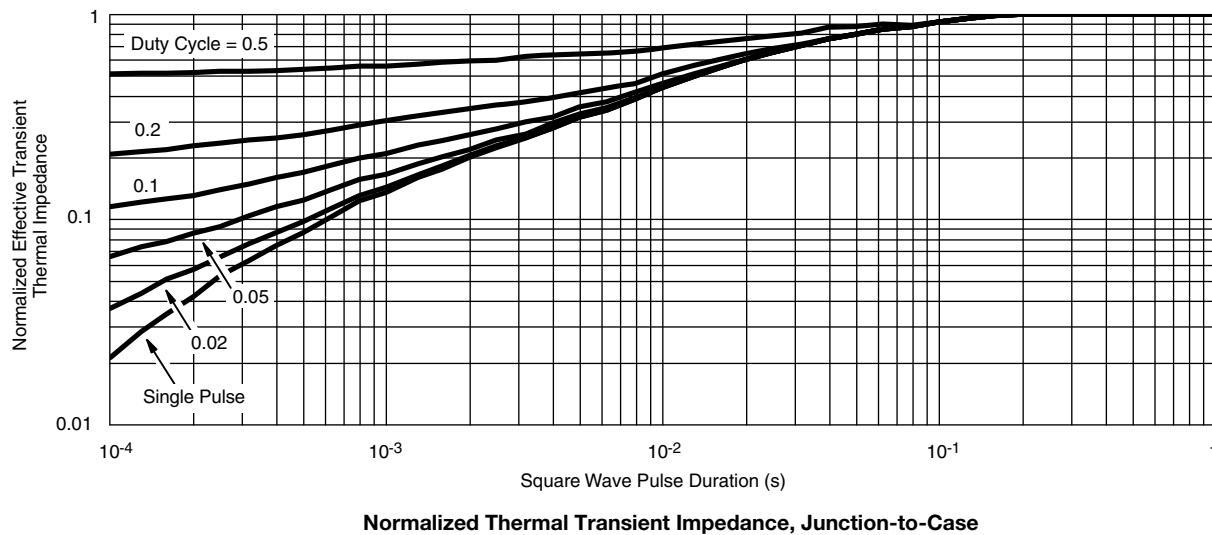
- a. Pulse test; pulse width $\leq 300 \mu\text{s}$, duty cycle $\leq 2 \%$.
- b. Guaranteed by design, not subject to production testing.
- c. Independent of operating temperature.

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


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

On-Resistance vs. Junction Temperature

Source Drain Diode Forward Voltage

On-Resistance vs. Gate-to-Source Voltage

Threshold Voltage

Drain Source Breakdown vs. Junction Temperature

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

Safe Operating Area

Normalized Thermal Transient Impedance, Junction-to-Ambient

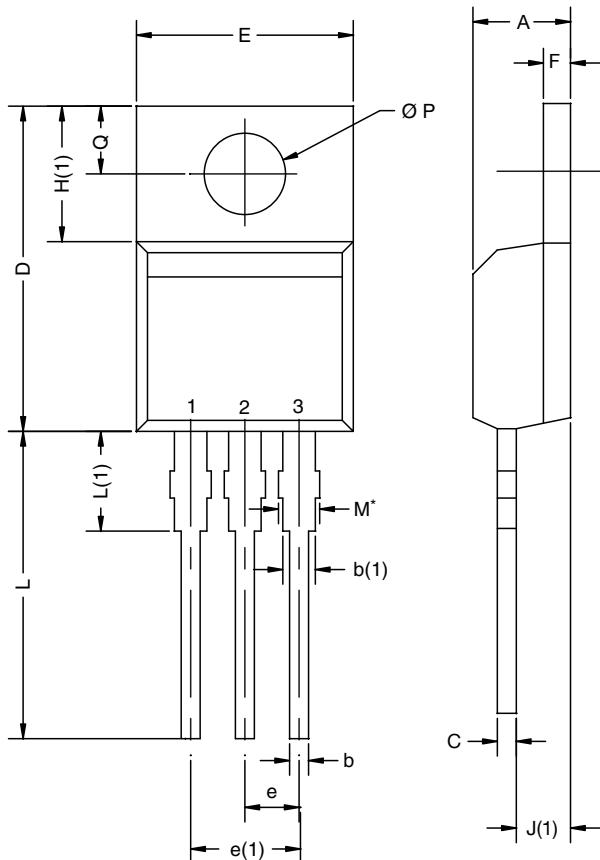
THERMAL RATINGS ($T_A = 25^\circ\text{C}$, unless otherwise noted)

Note

- The characteristics shown in the two graphs
 - Normalized Transient Thermal Impedance Junction-to-Ambient (25°C)
 - Normalized Transient Thermal Impedance Junction-to-Case (25°C)

are given for general guidelines only to enable the user to get a "ball park" indication of part capabilities. The data are extracted from single pulse transient thermal impedance characteristics which are developed from empirical measurements. The latter is valid for the part mounted on printed circuit board - FR4, size 1" x 1" x 0.062", double sided with 2 oz. copper, 100 % on both sides. The part capabilities can widely vary depending on actual application parameters and operating conditions.

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?62665.

TO-220AB

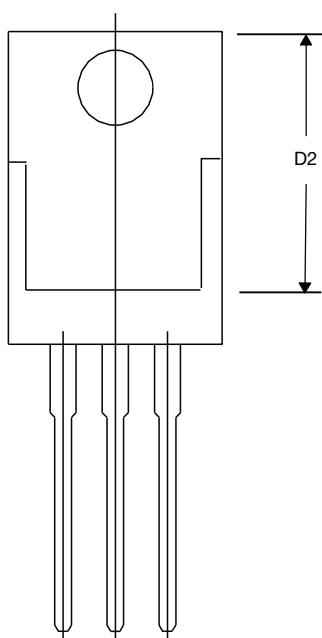


DIM.	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	4.25	4.65	0.167	0.183
b	0.69	1.01	0.027	0.040
b(1)	1.20	1.73	0.047	0.068
c	0.36	0.61	0.014	0.024
D	14.85	15.49	0.585	0.610
D2	12.19	12.70	0.480	0.500
E	10.04	10.51	0.395	0.414
e	2.41	2.67	0.095	0.105
e(1)	4.88	5.28	0.192	0.208
F	1.14	1.40	0.045	0.055
H(1)	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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- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



Как с нами связаться

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