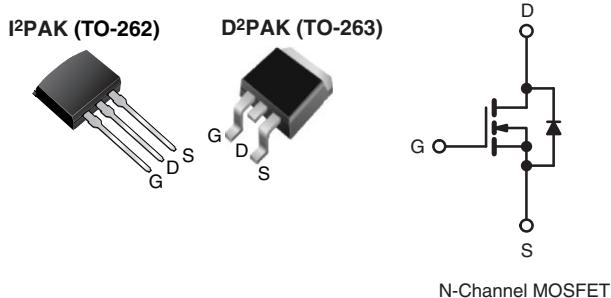


Power MOSFET

PRODUCT SUMMARY		
V _{DS} (V)	60	
R _{DS(on)} (Ω)	V _{GS} = 10 V	0.050
Q _g (Max.) (nC)		46
Q _{gs} (nC)		11
Q _{gd} (nC)		22
Configuration		Single



FEATURES

- Halogen-free According to IEC 61249-2-21
- Definition
- Advanced Process Technology
- Surface Mount
- Low-Profile Through-Hole (IRFZ34L, SiHFZ34L)
- 175 °C Operating Temperature
- Fast Switching
- Compliant to RoHS Directive 2002/95/EC



DESCRIPTION

Third generation Power MOSFETs from Vishay utilize advanced processing techniques to achieve extremely low on-resistance per silicon area. This benefit, combined with the fast switching speed and ruggedized device design that Power MOSFETs are well known for, provides the designer with an extremely efficient and reliable device for use in a wide variety of applications.

The D²PAK is a surface mount power package capable of accommodating die sizes up to HEX-4. It provides the highest power capability and the lowest possible on-resistance in any existing surface mount package. The D²PAK is suitable for high current applications because of its low internal connection resistance and can dissipate up to 2 W in a typical surface mount application.

The through-hole version (IRFZ34L, SiHFZ34L) is available for low-profile applications.

ORDERING INFORMATION				
Package	D ² PAK (TO-263)	D ² PAK (TO-263)	D ² PAK (TO-263)	I ² PAK (TO-262)
Lead (Pb)-free and Halogen-free	-	-	SiHFZ34STRPbF ^a	-
Lead (Pb)-free	IRFZ34SPbF SiHFZ34S-E3	IRFZ34STRRPbF ^a SiHFZ34STRPbF ^a	IRFZ34STRLPbF ^a SiHFZ34STLPbF ^a	IRFZ34LPbF SiHFZ34L-E3

Note

a. See device orientation.

ABSOLUTE MAXIMUM RATINGS (T _C = 25 °C, unless otherwise noted)					
PARAMETER			SYMBOL	LIMIT	UNIT
Drain-Source Voltage			V _{DS}	60	
Gate-Source Voltage			V _{GS}	± 20	V
Continuous Drain Current	V _{GS} at 10 V	T _C = 25 °C	I _D	30	A
		T _C = 100 °C		21	
Pulsed Drain Current ^{a, e}			I _{DM}	120	
Linear Derating Factor				0.59	W/°C
Single Pulse Avalanche Energy ^{b, e}			E _{AS}	200	mJ
Maximum Power Dissipation		T _C = 25 °C	P _D	88	W
		T _A = 25 °C		3.7	
Peak Diode Recovery dV/dt ^{c, e}			dV/dt	4.5	V/ns
Operating Junction and Storage Temperature Range		T _J , T _{stg}		- 55 to + 175	°C
Soldering Recommendations (Peak Temperature)	for 10 s			300 ^d	

Notes

- Repetitive rating; pulse width limited by maximum junction temperature (see fig. 11).
- V_{DD} = 25 V, Starting T_J = 25 °C, L = 260 µH, R_g = 25 Ω, I_{AS} = 30 A (see fig. 12).
- I_{SD} ≤ 30 A, dI/dt ≤ 200 A/µs, V_{DD} ≤ V_{DS}, T_J ≤ 175 °C.
- 1.6 mm from case.
- Uses IRFZ34, SiHFZ34 data and test conditions.

* Pb containing terminations are not RoHS compliant, exemptions may apply

THERMAL RESISTANCE RATINGS

PARAMETER	SYMBOL	TYP.	MAX.	UNIT
Maximum Junction-to-Ambient (PCB Mount) ^a	R _{thJA}	-	40	°C / W
Maximum Junction-to-Case (Drain)	R _{thJC}	-	1.7	

Note

a. When mounted on 1" square PCB (FR-4 or G-10 material).

SPECIFICATIONS ($T_J = 25$ °C, unless otherwise noted)

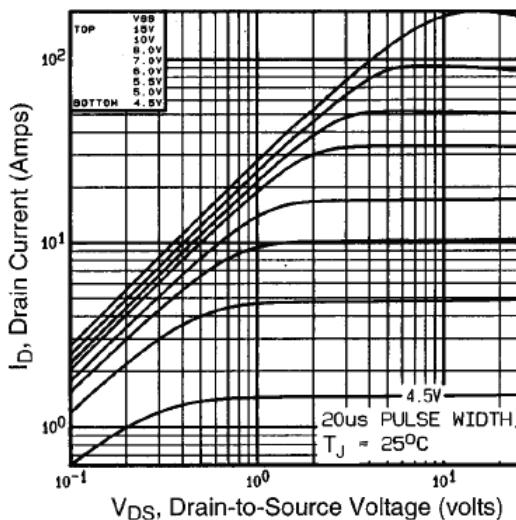
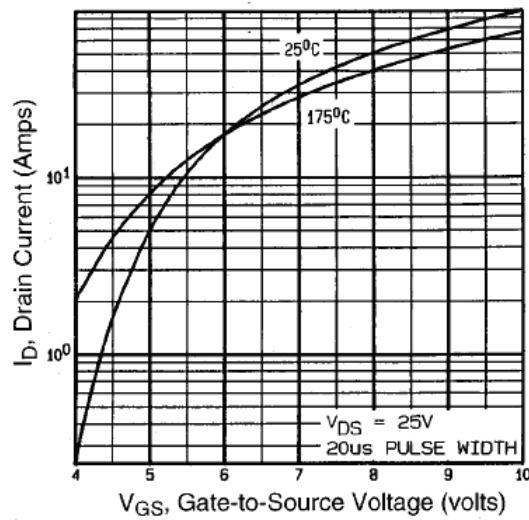
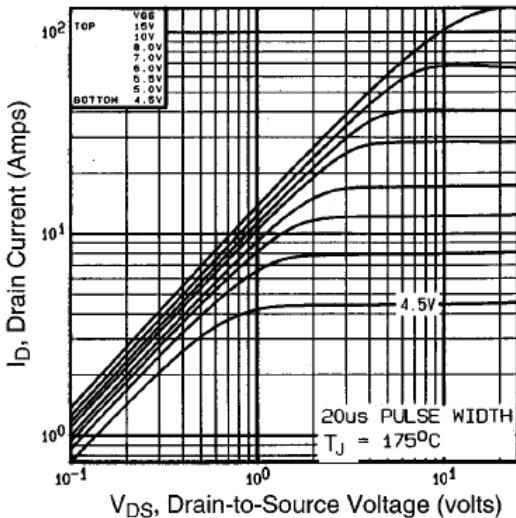
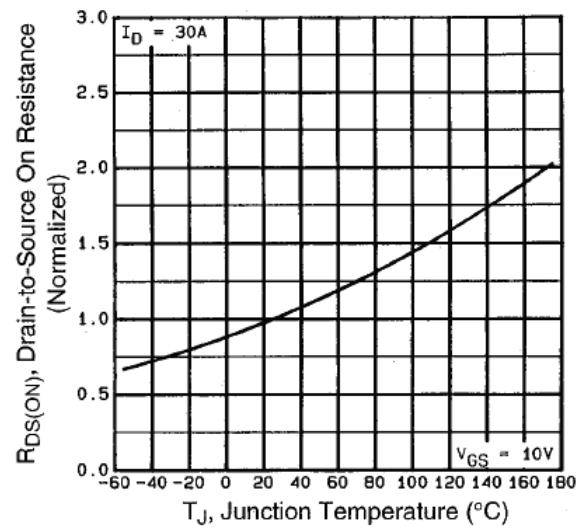
PARAMETER	SYMBOL	TEST CONDITIONS		MIN.	TYP.	MAX.	UNIT
Static							
Drain-Source Breakdown Voltage	V _{DS}	V _{GS} = 0 V, I _D = 250 μA		60	-	-	V
V _{DS} Temperature Coefficient	ΔV _{DS} /T _J	Reference to 25 °C, I _D = 1 mA ^c		-	0.065	-	V/°C
Gate-Source Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250 μA		2.0	-	4.0	V
Gate-Source Leakage	I _{GSS}	V _{GS} = ± 20 V		-	-	± 100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 60 V, V _{GS} = 0 V		-	-	25	μA
		V _{DS} = 48 V, V _{GS} = 0 V, T _J = 150 °C		-	-	250	
Drain-Source On-State Resistance	R _{DSS(on)}	V _{GS} = 10 V	I _D = 18 A ^b	-	-	0.05	Ω
Forward Transconductance	g _{fs}	V _{DS} = 25 V, I _D = 18 A ^b		9.3	-	-	S
Dynamic							
Input Capacitance	C _{iss}	V _{GS} = 0 V, V _{DS} = 25 V, f = 1.0 MHz, see fig. 5 ^c		-	1200	-	pF
Output Capacitance	C _{oss}			-	600	-	
Reverse Transfer Capacitance	C _{rss}			-	100	-	
Total Gate Charge	Q _g	V _{GS} = 10 V	I _D = 30 A, V _{DS} = 48 V, see fig. 6 and 13 ^{b, c}	-	-	46	nC
Gate-Source Charge	Q _{gs}			-	-	11	
Gate-Drain Charge	Q _{gd}			-	-	22	
Turn-On Delay Time	t _{d(on)}			-	13	-	
Rise Time	t _r	V _{DD} = 30 V, I _D = 30 A, R _g = 12 Ω, R _D = 1.0 Ω, see fig. 10 ^{b, c}		-	100	-	ns
Turn-Off Delay Time	t _{d(off)}			-	29	-	
Fall Time	t _f			-	52	-	
Internal Source Inductance	L _S			-	7.5	-	nH
Drain-Source Body Diode Characteristics							
Continuous Source-Drain Diode Current	I _S	MOSFET symbol showing the integral reverse p - n junction diode		-	-	30	A
Pulsed Diode Forward Current ^a	I _{SM}			-	-	120	
Body Diode Voltage	V _{SD}	T _J = 25 °C, I _S = 30 A, V _{GS} = 0 V ^b		-	-	1.6	V
Body Diode Reverse Recovery Time	t _{rr}	T _J = 25 °C, I _F = 30 A, dI/dt = 100 A/μs ^{b, c}		-	120	230	ns
Body Diode Reverse Recovery Charge	Q _{rr}			-	700	1400	μC
Forward Turn-On Time	t _{on}	Intrinsic turn-on time is negligible (turn-on is dominated by L _S and L _D)					

Notes

a. Repetitive rating; pulse width limited by maximum junction temperature (see fig. 11).

b. Pulse width ≤ 300 μs; duty cycle ≤ 2 %.

c. Uses IRFZ34, SiHFZ34 data and test conditions.

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

Fig. 1 - Typical Output Characteristics

Fig. 3 - Typical Transfer Characteristics

Fig. 2 - Typical Output Characteristics

Fig. 4 - Normalized On-Resistance vs. Temperature

IRFZ34S, IRFZ34L, SiHFZ34S, SiHFZ34L

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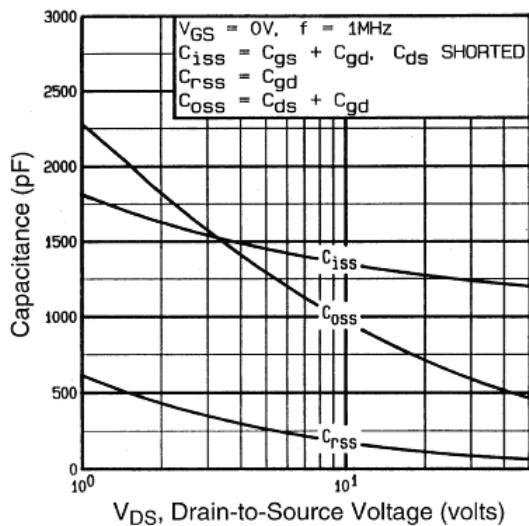


Fig. 5 - Typical Capacitance vs. Drain-to-Source Voltage

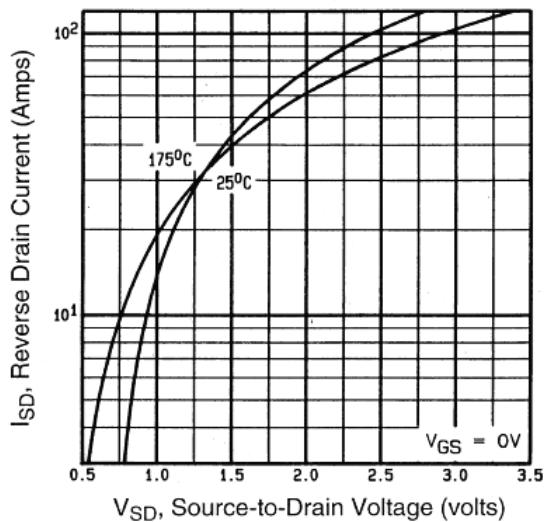


Fig. 7 - Typical Source-Drain Diode Forward Voltage

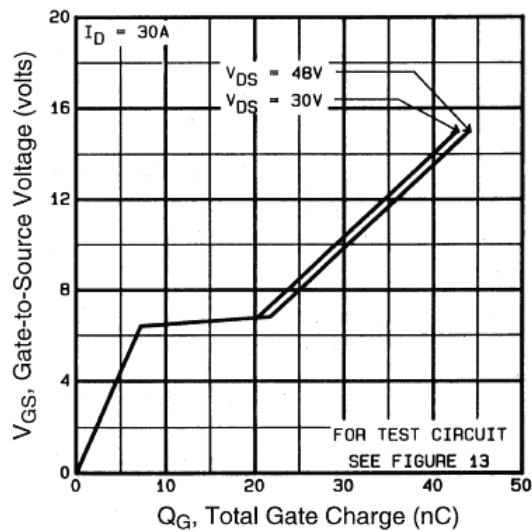


Fig. 6 - Typical Gate Charge vs. Gate-to-Source Voltage

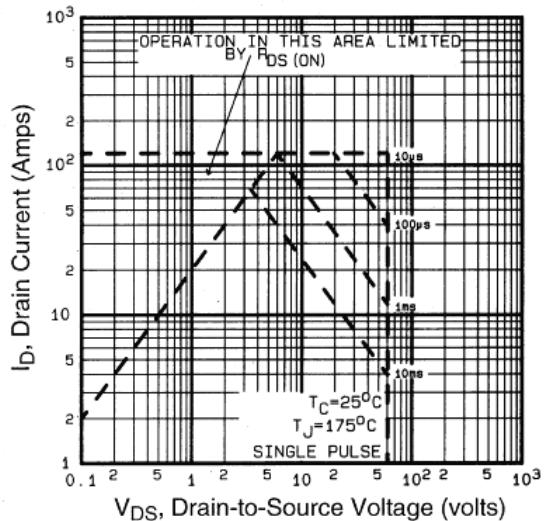


Fig. 8 - Maximum Safe Operating Area

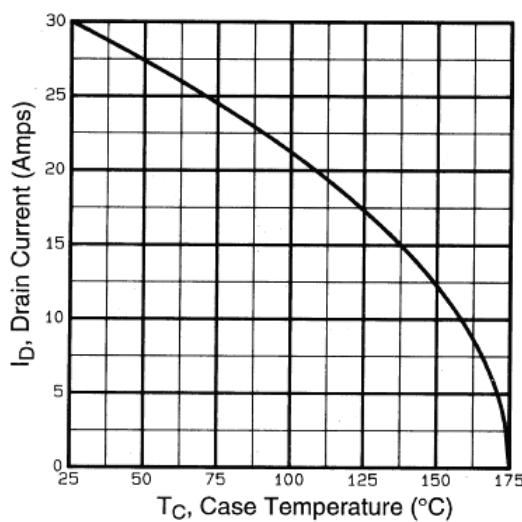


Fig. 9 - Maximum Drain Current vs. Case Temperature

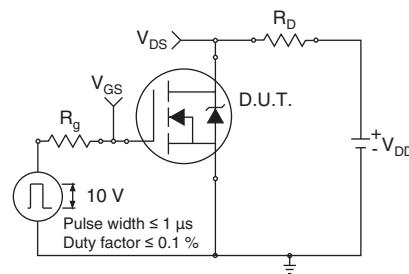


Fig. 10a - Switching Time Test Circuit

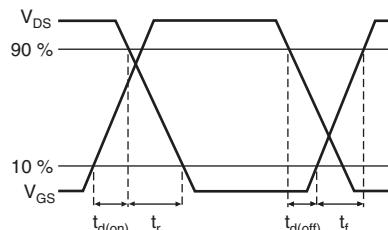


Fig. 10b - Switching Time Waveforms

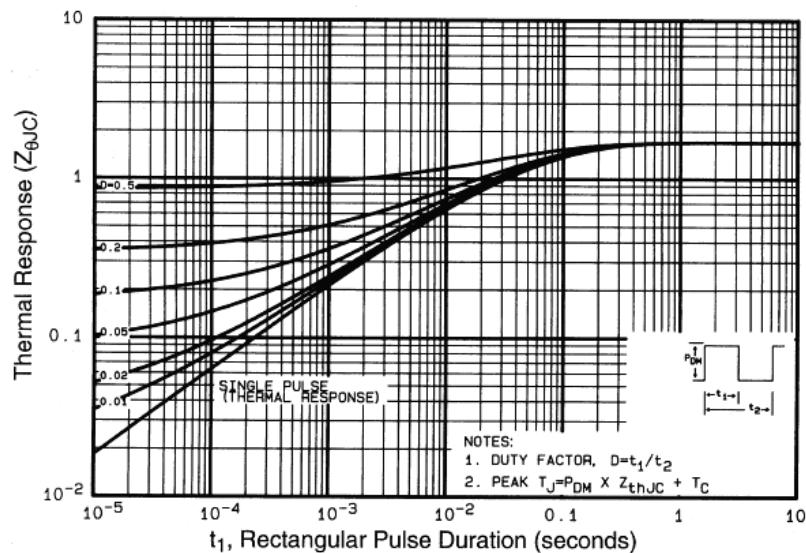


Fig. 11 - Maximum Effective Transient Thermal Impedance, Junction-to-Case

IRFZ34S, IRFZ34L, SiHFZ34S, SiHFZ34L

Vishay Siliconix

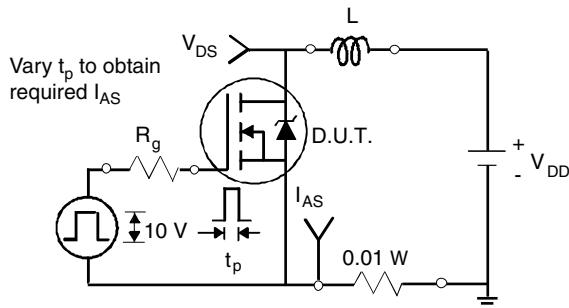


Fig. 12a - Unclamped Inductive Test Circuit

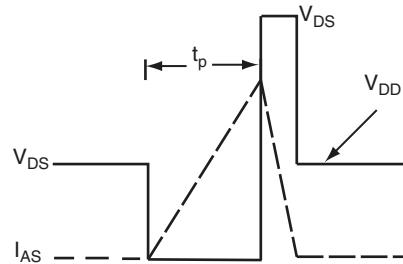


Fig. 12b - Unclamped Inductive Waveforms

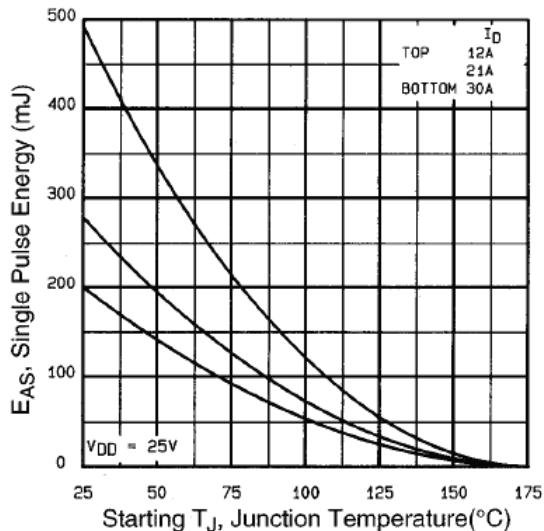


Fig. 12c - Maximum Avalanche Energy vs. Drain Current

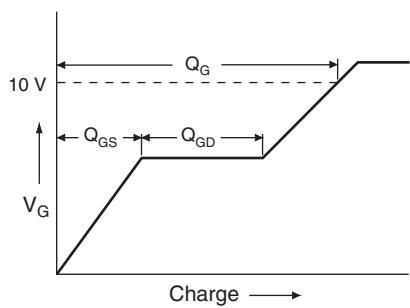


Fig. 13a - Maximum Avalanche Energy vs. Drain Current

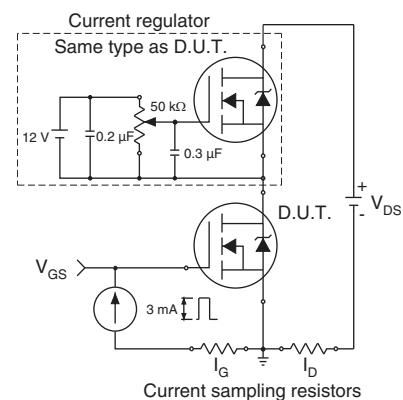
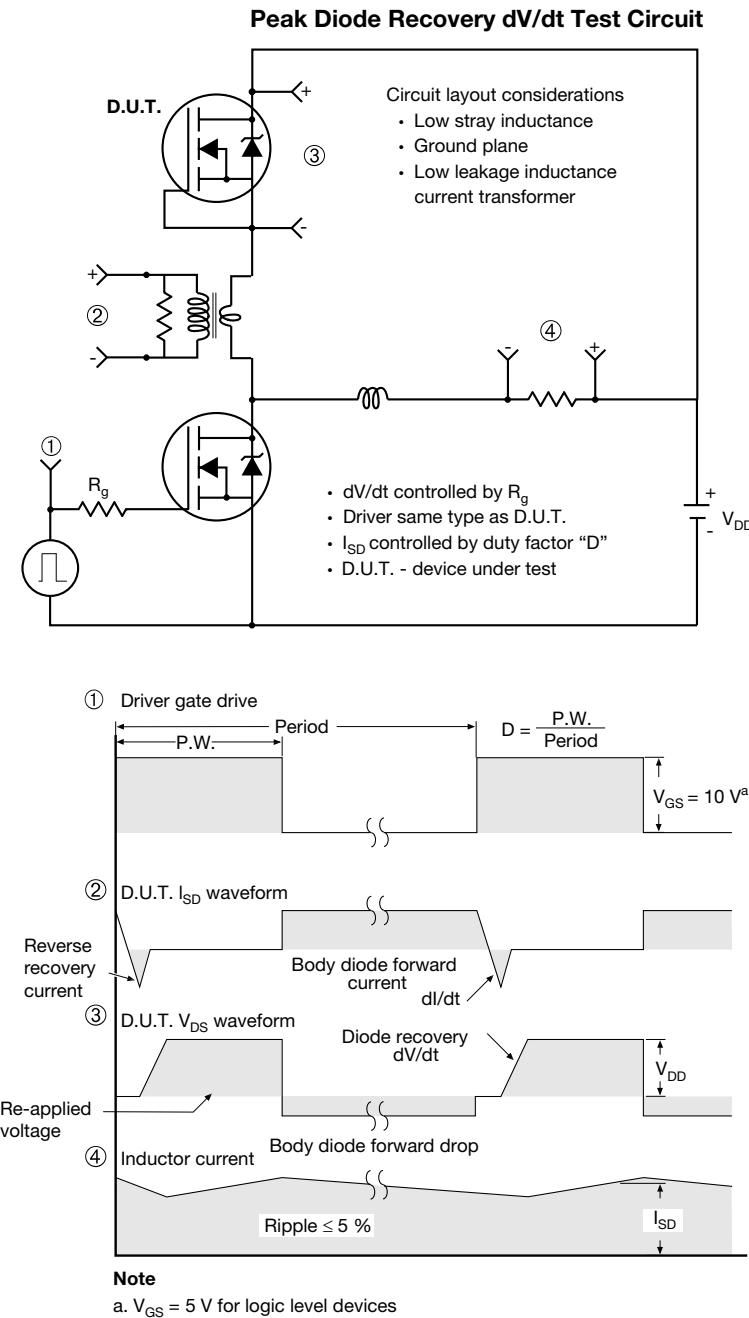


Fig. 13b - Gate Charge Test Circuit


Fig. 14 - For N-Channel

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?90368.

TO-263AB (HIGH VOLTAGE)



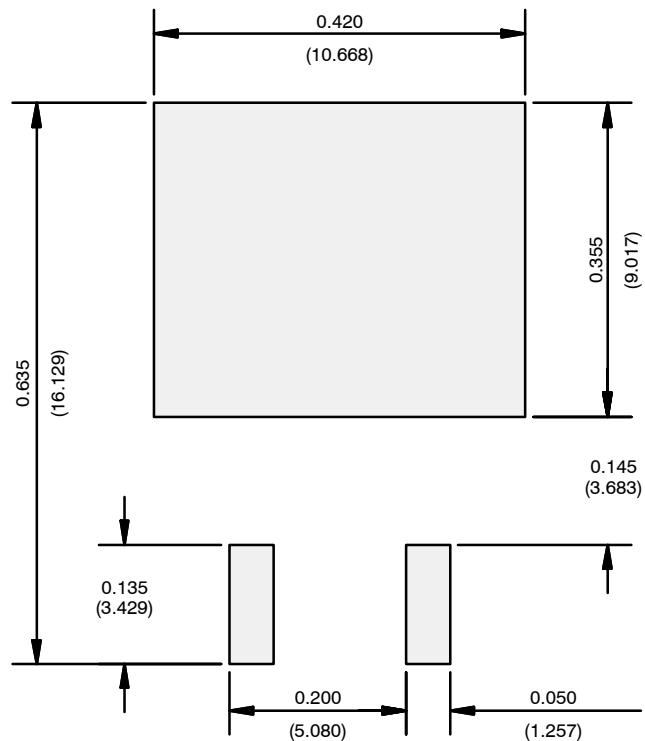
DIM.	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	4.06	4.83	0.160	0.190
A1	0.00	0.25	0.000	0.010
b	0.51	0.99	0.020	0.039
b1	0.51	0.89	0.020	0.035
b2	1.14	1.78	0.045	0.070
b3	1.14	1.73	0.045	0.068
c	0.38	0.74	0.015	0.029
c1	0.38	0.58	0.015	0.023
c2	1.14	1.65	0.045	0.065
D	8.38	9.65	0.330	0.380

ECN: S-82110-Rev. A, 15-Sep-08
DWG: 5970

DIM.	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
D1	6.86	-	0.270	-
E	9.65	10.67	0.380	0.420
E1	6.22	-	0.245	-
e	2.54 BSC		0.100 BSC	
H	14.61	15.88	0.575	0.625
L	1.78	2.79	0.070	0.110
L1	-	1.65	-	0.066
L2	-	1.78	-	0.070
L3	0.25 BSC		0.010 BSC	
L4	4.78	5.28	0.188	0.208

Notes

- Dimensioning and tolerancing per ASME Y14.5M-1994.
- Dimensions are shown in millimeters (inches).
- Dimension D and E do not include mold flash. Mold flash shall not exceed 0.127 mm (0.005") per side. These dimensions are measured at the outmost extremes of the plastic body at datum A.
- Thermal PAD contour optional within dimension E, L1, D1 and E1.
- Dimension b1 and c1 apply to base metal only.
- Datum A and B to be determined at datum plane H.
- Outline conforms to JEDEC outline to TO-263AB.

RECOMMENDED MINIMUM PADS FOR D²PAK: 3-Lead

Recommended Minimum Pads
Dimensions in Inches/(mm)

[Return to Index](#)



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- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помошь в подборе аналогов, поставка прототипов;
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- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
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- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



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