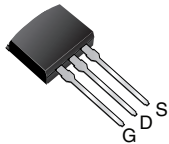


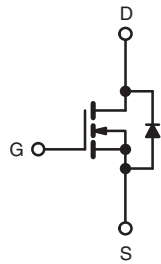
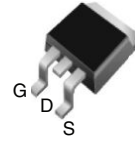
Power MOSFET

PRODUCT SUMMARY		
V_{DS} (V)	400	
$R_{DS(on)}$ (Max.) (Ω)	$V_{GS} = 10$ V	1.0
Q_g (Max.) (nC)	22	
Q_{gs} (nC)	5.8	
Q_{gd} (nC)	9.3	
Configuration	Single	

I²PAK (TO-262)



D²PAK (TO-263)



N-Channel MOSFET

FEATURES

- Halogen-free According to IEC 61249-2-21 Definition
- Low Gate Charge Q_g Results in Simple Drive Requirement
- Improved Gate, Avalanche and Dynamic dV/dt Ruggedness
- Fully Characterized Capacitance and Avalanche Voltage and Current
- Effective C_{oss} Specified
- Compliant to RoHS Directive 2002/95/EC



APPLICATIONS

- Switch Mode Power Supply (SMPS)
- Uninterruptible Power Supply
- High Speed Power Switching

TYPICAL SMPS TOPOLOGIES

- Single Transistor Flyback Xfmr. Reset
- Single Transistor Forward Xfmr. Reset (Both US Line Input Only)

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	SiHF730AS-GE3	SiHF730ASTRL-GE3 ^a	SiHF730ASTRR-GE3 ^a	SiHF730AL-GE3
Lead (Pb)-free	IRF730ASPbF	IRF730ASTRLPbF ^a	IRF730ASTRRPbF ^a	IRF730ALPbF
	SiHF730AS-E3	SiHF730ASTL-E3 ^a	SiHF730ASTR-E3 ^a	SiHF730AL-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}	400	V	
Gate-Source Voltage	V_{GS}	± 30		
Continuous Drain Current	V_{GS} at 10 V	$T_C = 25$ °C	5.5	A
		$T_C = 100$ °C	3.5	
Pulsed Drain Current ^{a, e}	I_{DM}	22		
Linear Derating Factor		0.6	W/°C	
Single Pulse Avalanche Energy ^{b, e}	E_{AS}	290	mJ	
Avalanche Current ^a	I_{AR}	5.5	A	
Repetitive Avalanche Energy ^a	E_{AR}	7.4	mJ	
Maximum Power Dissipation	$T_C = 25$ °C	P_D	74	W
Peak Diode Recovery dV/dt ^{c, e}		dV/dt	4.6	V/ns
Operating Junction and Storage Temperature Range		T_J, T_{stg}	- 55 to + 150	°C
Soldering Recommendations (Peak Temperature)	for 10 s		300 ^d	

Notes

- Repetitive rating; pulse width limited by maximum junction temperature (see fig. 11).
- Starting $T_J = 25$ °C, $L = 19$ mH, $R_g = 25$ Ω , $I_{AS} = 5.5$ A (see fig. 12).
- $I_{SD} \leq 5.5$ A, $dI/dt \leq 90$ A/ μ s, $V_{DD} \leq V_{DS}$, $T_J \leq 150$ °C.
- 1.6 mm from case.
- Uses IRF730A, SiHF730A data and test conditions.

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

IRF730AS, SiHF730AS, IRF730AL, SiHF730AL




Vishay Siliconix

THERMAL RESISTANCE RATINGS				
PARAMETER	SYMBOL	TYP.	MAX.	UNIT
Maximum Junction-to-Ambient (PCB Mounted, steady-state) ^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).

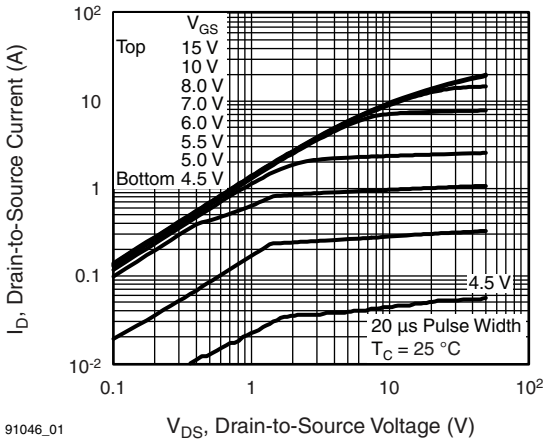
SPECIFICATIONS ($T_J = 25\text{ }^\circ\text{C}$, unless otherwise noted)							
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT	
Static							
Drain-Source Breakdown Voltage	V_{DS}	$V_{GS} = 0, I_D = 250\text{ }\mu\text{A}$	400	-	-	V	
V_{DS} Temperature Coefficient	$\Delta V_{DS}/T_J$	Reference to $25\text{ }^\circ\text{C}$, $I_D = 1\text{ mA}^d$	-	0.5	-	V/°C	
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$	2.0	-	4.5	V	
Gate-Source Leakage	I_{GSS}	$V_{GS} = \pm 30\text{ V}$	-	-	± 100	nA	
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 400\text{ V}, V_{GS} = 0\text{ V}$	-	-	25	μA	
		$V_{DS} = 320\text{ V}, V_{GS} = 0\text{ V}, T_J = 125\text{ }^\circ\text{C}$	-	-	250		
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS} = 10\text{ V}$ $I_D = 3.3\text{ A}^b$	-	-	1.0	Ω	
Forward Transconductance	g_{fs}	$V_{DS} = 50\text{ V}, I_D = 3.3\text{ A}^d$	3.1	-	-	S	
Dynamic							
Input Capacitance	C_{iss}	$V_{GS} = 0\text{ V},$ $V_{DS} = 25\text{ V},$ $f = 1.0\text{ MHz},$ see fig. 5 ^d	-	600	-	pF	
Output Capacitance	C_{oss}		-	103	-		
Reverse Transfer Capacitance	C_{rss}		-	4.0	-		
Output Capacitance	C_{oss}	$V_{GS} = 0\text{ V}$	$V_{DS} = 1.0\text{ V}, f = 1.0\text{ MHz}$	-	890	-	
Effective Output Capacitance	$C_{oss\text{ eff.}}$		$V_{DS} = 320\text{ V}, f = 1.0\text{ MHz}$	-	30	-	
Total Gate Charge	Q_g	$V_{GS} = 10\text{ V}$	$I_D = 3.5\text{ A}, V_{DS} = 320\text{ V},$ see fig. 6 and 13 ^{b, d}	-	-	22	nC
Gate-Source Charge	Q_{gs}			-	-	5.8	
Gate-Drain Charge	Q_{gd}			-	-	9.3	
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 200\text{ V}, I_D = 3.5\text{ A},$ $R_g = 12\text{ }\Omega, R_D = 57\text{ }\Omega,$ see fig. 10 ^{b, d}	-	10	-	ns	
Rise Time	t_r		-	22	-		
Turn-Off Delay Time	$t_{d(off)}$		-	20	-		
Fall Time	t_f		-	16	-		
Drain-Source Body Diode Characteristics							
Continuous Source-Drain Diode Current	I_S	MOSFET symbol showing the integral reverse p - n junction diode 	-	-	5.5	A	
Pulsed Diode Forward Current ^a	I_{SM}		-	-	22		
Body Diode Voltage	V_{SD}	$T_J = 25\text{ }^\circ\text{C}, I_S = 5.5\text{ A}, V_{GS} = 0\text{ V}^b$	-	-	1.6	V	
Body Diode Reverse Recovery Time	t_{rr}	$T_J = 25\text{ }^\circ\text{C}, I_F = 3.5\text{ A}, dI/dt = 100\text{ A}/\mu\text{s}^b, d$	-	370	550	ns	
Body Diode Reverse Recovery Charge	Q_{rr}		-	1.6	2.4	μC	
Forward Turn-On Time	t_{on}	Intrinsic turn-on time is negligible (turn-on is dominated by L_S and L_D)					

Notes

- Repetitive rating; pulse width limited by maximum junction temperature (see fig. 11).
- Pulse width $\leq 300\text{ }\mu\text{s}$; duty cycle $\leq 2\%$.
- $C_{oss\text{ eff.}}$ is a fixed capacitance that gives the same charging time as C_{oss} while V_{DS} is rising from 0 % to 80 % V_{DS} .
- Uses IRF730A, SiHF730A data and test conditions.

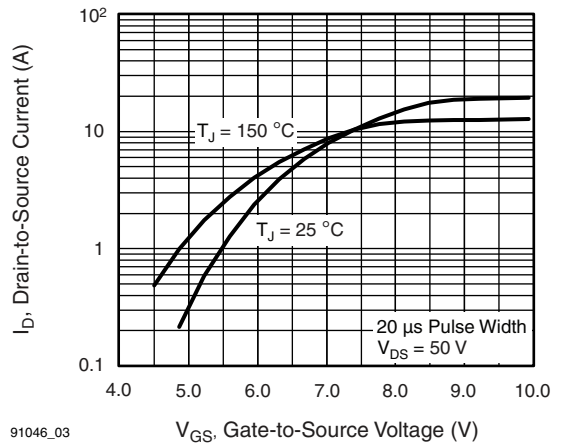


TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



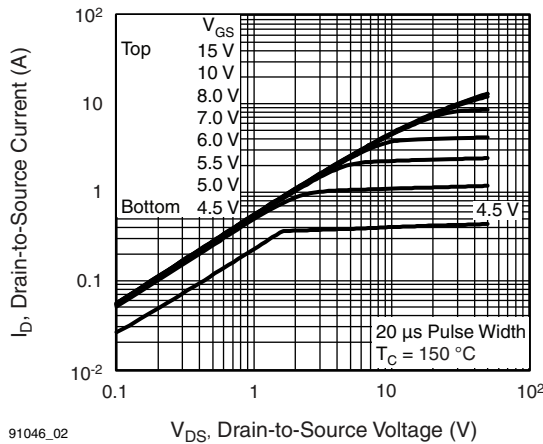
91046_01

Fig. 1 - Typical Output Characteristics



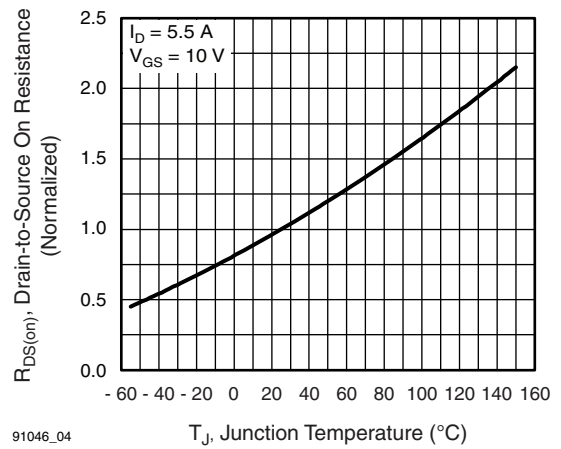
91046_03

Fig. 3 - Typical Transfer Characteristics



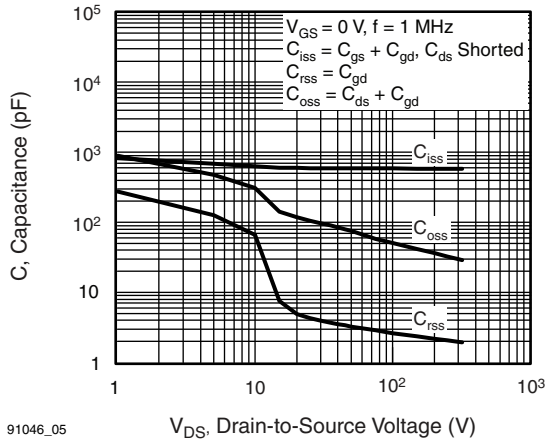
91046_02

Fig. 2 - Typical Output Characteristics

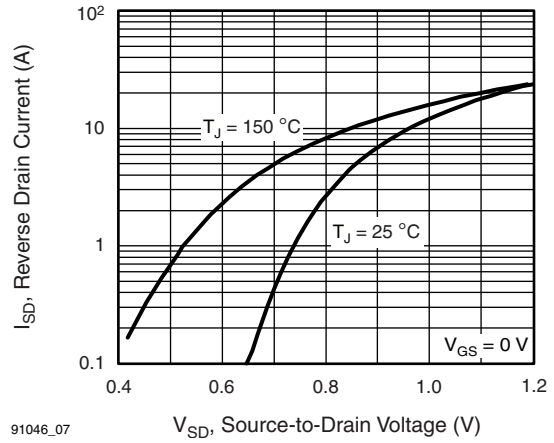


91046_04

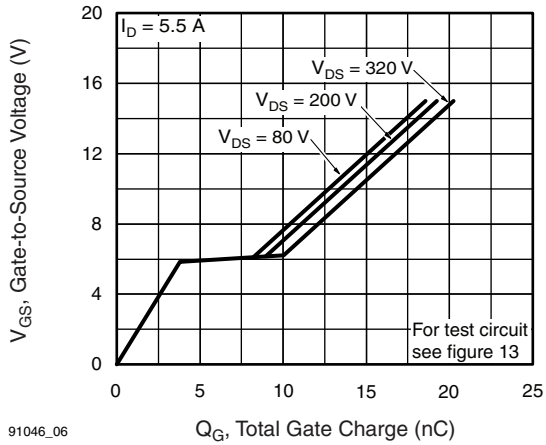
Fig. 4 - Normalized On-Resistance vs. Temperature



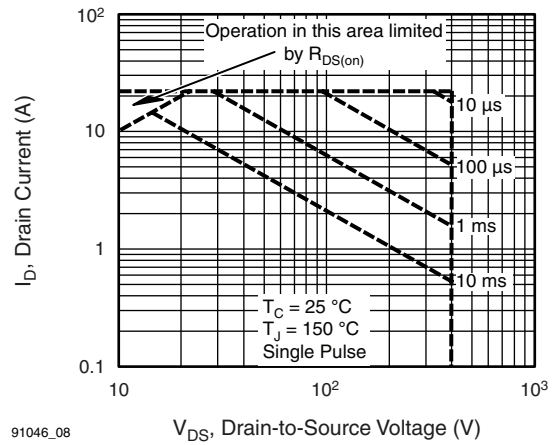
91046_05
Fig. 5 - Typical Capacitance vs. Drain-to-Source Voltage



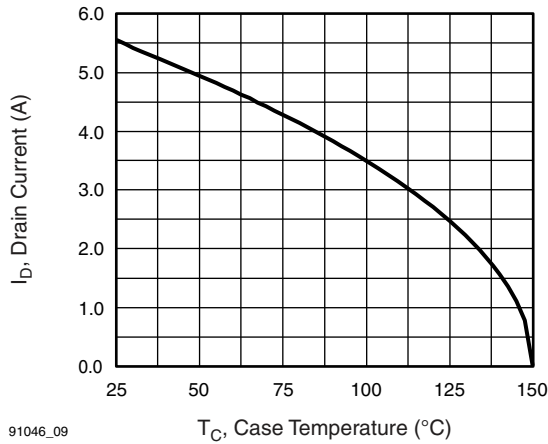
91046_07
Fig. 7 - Typical Source-Drain Diode Forward Voltage



91046_06
Fig. 6 - Typical Gate Charge vs. Gate-to-Source Voltage



91046_08
Fig. 8 - Maximum Safe Operating Area



91046_09

Fig. 9 - Maximum Drain Current vs. Case Temperature

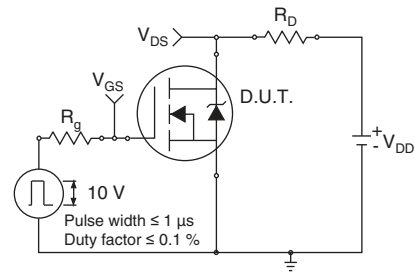


Fig. 10a - Switching Time Test Circuit

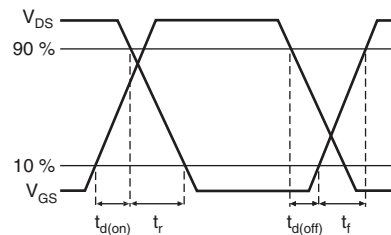
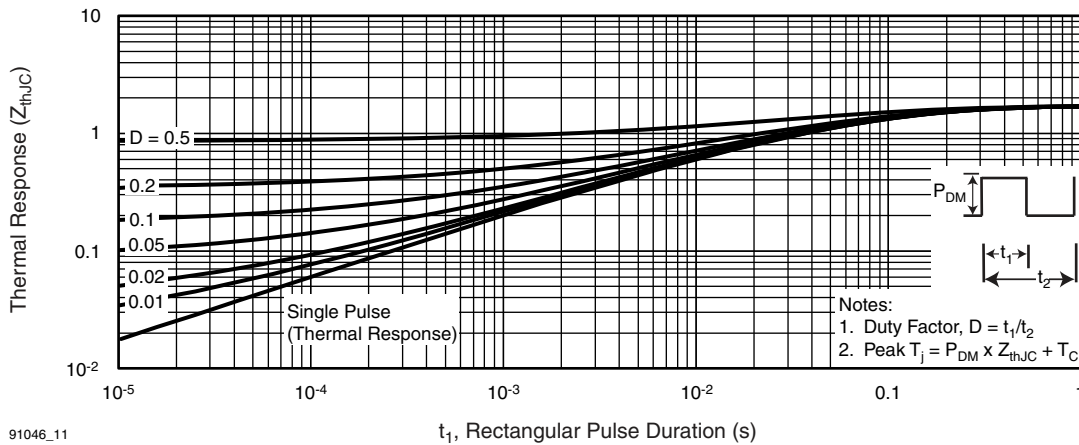


Fig. 10b - Switching Time Waveforms



91046_11

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

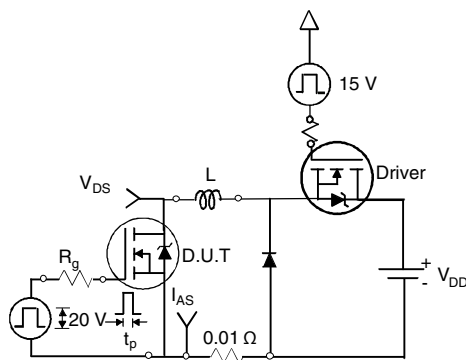


Fig. 12a - Unclamped Inductive Test Circuit

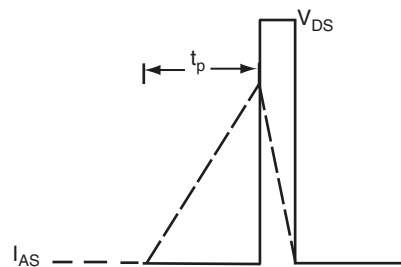
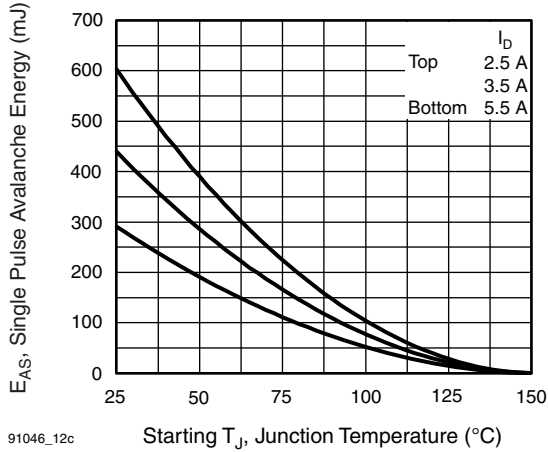
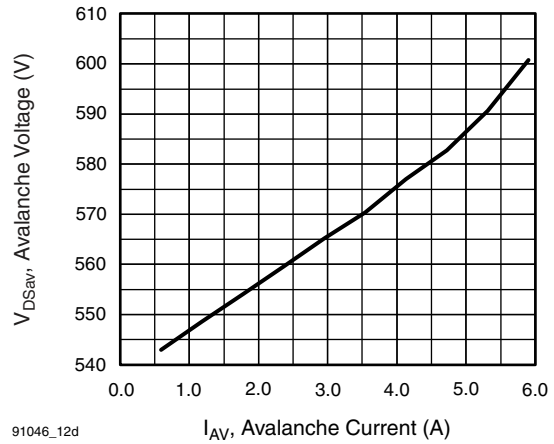


Fig. 12b - Unclamped Inductive Waveforms



91046_12c

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



91046_12d

Fig. 12d - Typical Drain-to-Source Voltage vs. Avalanche Current

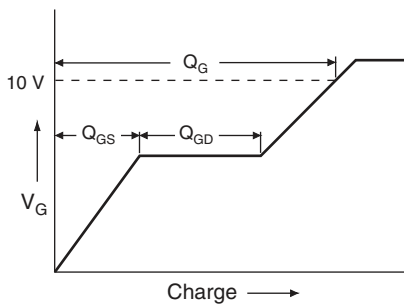


Fig. 13a - Maximum Avalanche Energy vs. Drain Current

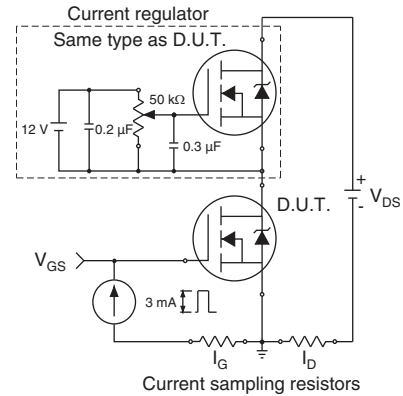
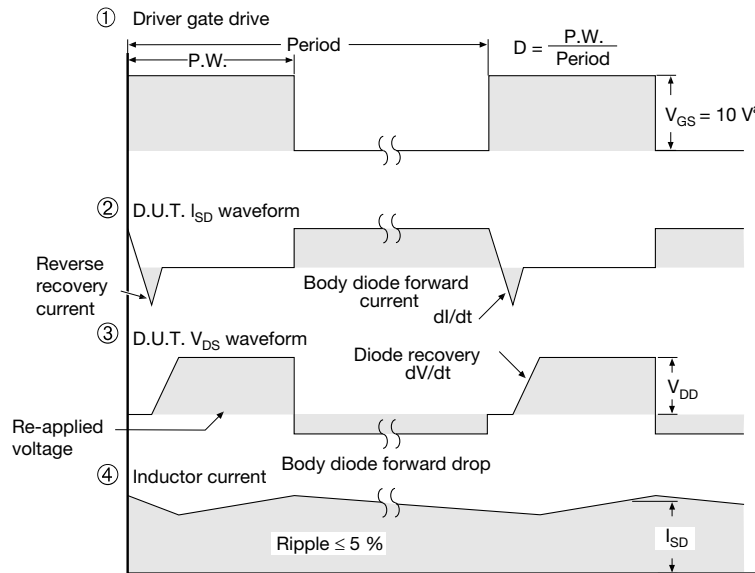
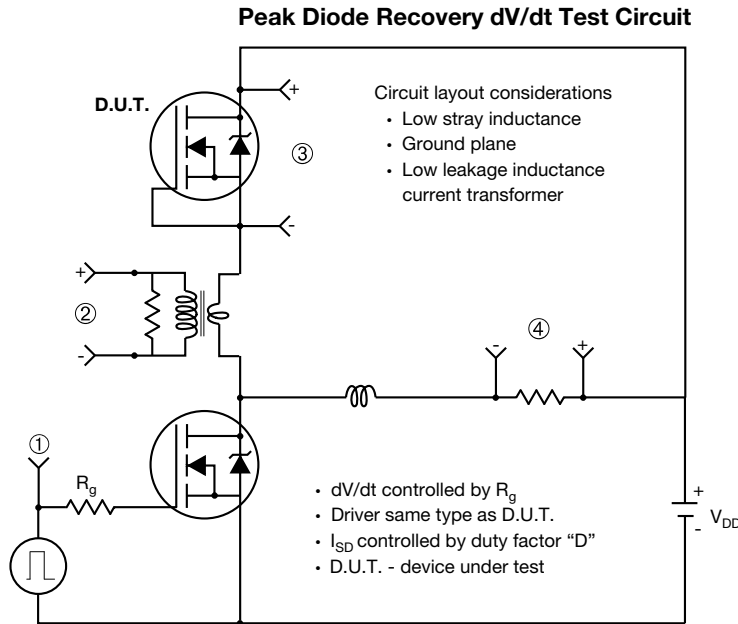


Fig. 13b - Gate Charge Test Circuit



Note

a. $V_{GS} = 5 V$ for logic level devices

Fig. 14 - For N-Channel

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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

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

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

Notes

1. Dimensioning and tolerancing per ASME Y14.5M-1994.
2. Dimensions are shown in millimeters (inches).
3. 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.
4. Thermal PAD contour optional within dimension E, L1, D1 and E1.
5. Dimension b1 and c1 apply to base metal only.
6. Datum A and B to be determined at datum plane H.
7. 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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Please note that some Vishay documentation may still make reference to RoHS Directive 2002/95/EC. We confirm that all the products identified as being compliant to Directive 2002/95/EC conform to Directive 2011/65/EU.

Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as Halogen-Free follow Halogen-Free requirements as per JEDEC JS709A standards. Please note that some Vishay documentation may still make reference to the IEC 61249-2-21 definition. We confirm that all the products identified as being compliant to IEC 61249-2-21 conform to JEDEC JS709A standards.



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Наши преимущества:

- Оперативные поставки широкого спектра электронных компонентов отечественного и импортного производства напрямую от производителей и с крупнейших мировых складов;
- 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, помощь в подборе аналогов, поставка прототипов;
- Система менеджмента качества сертифицирована по Международному стандарту ISO 9001;
- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
- Поставка специализированных компонентов (Xilinx, Altera, Analog Devices, Intersil, Interpoint, Microsemi, Aeroflex, Peregrine, Syfer, Eurofarad, Texas Instrument, Miteq, Cobham, E2V, MA-COM, Hittite, Mini-Circuits, General Dynamics и др.);

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- Подбор оптимального решения, техническое обоснование при выборе компонента;
- 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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Факс: 8 (812) 320-02-42

Электронная почта: org@eplast1.ru

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