Power MOSFET

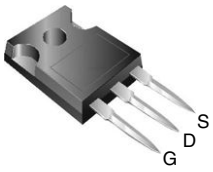
PRODUCT SUMMARY		
V_{DS} (V) at T_J max.	560 V	
$R_{DS(on)}$ (Ω)	V_{GS} = 10 V	0.38
Q_g (Max.) (nC)	68	
Q_{gs} (nC)	17.6	
Q_{gd} (nC)	21.8	
Configuration	Single	

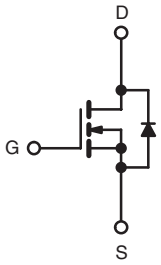
FEATURES

- Low Figure-of-Merit R_{on} x Q_g
- 100 % Avalanche Tested
- Gate Charge Improved
- T_{rr}/Q_{rr} Improved
- Compliant to RoHS Directive 2002/95/EC

Available
RoHS* COMPLIANT

TO-247AC





N-Channel MOSFET

ORDERING INFORMATION	
Package	TO-247AC
Lead (Pb)-free	SiHG16N50C-E3

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

PARAMETER			SYMBOL	LIMIT	UNIT
Drain-Source Voltage			V_{DS}	500	V
Gate-Source Voltage			V_{GS}	± 30	
Continuous Drain Current (T_J = 150 °C)[a]	V_{GS} at 10 V	T_C = 25 °C	I_D	16	A
		T_C = 100 °C		10	
Pulsed Drain Current[c]			I_{DM}	40	
Linear Derating Factor				2	W/°C
Single Pulse Avalanche Energy[b]			E_{AS}	320	mJ
Maximum Power Dissipation			P_D	250	W
Operating Junction and Storage Temperature Range			T_J, T_{stg}	- 55 to + 150	°C
Soldering Recommendations (Peak Temperature)[d]	for 10 s			300	

Notes

a. Limited by maximum junction temperature.
b. V_{DD} = 50 V, starting T_J = 25 °C, L = 2.5 mH, R_g = 25 Ω, I_{AS} = 16 A.
c. Repetitive rating; pulse width limited by maximum junction temperature.
d. 1.6 mm from case.

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

THERMAL RESISTANCE RATINGS				
PARAMETER	**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Maximum Junction-to-Ambient	R_{thJA}	-	40	°C/W
Maximum Junction-to-Case (Drain)	R_{thJC}	-	0.5	

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	500	-	-	V
V_{DS} Temperature Coefficient	$\Delta V_{DS}/T_J$	Reference to 25 °C, I_D = 1 mA	-	0.6	-	V/°C
Gate-Source Threshold Voltage (N)	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 µA	3.0	-	5.0	V
Gate-Source Leakage	I_{GSS}	V_{GS} = ± 30 V	-	-	± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 500 V, V_{GS} = 0 V	-	-	50	µA
		V_{DS} = 400 V, V_{GS} = 0 V, T_J = 125 °C	-	-	250	
Drain-Source On-State Resistance	$R_{DS(on)}$	V_{GS} = 10 V; I_D = 8 A	-	0.317	0.38	Ω
Forward Transconductance[a]	g_{fs}	V_{DS} = 50 V, I_D = 3 A	-	3	-	S
Dynamic						
Input Capacitance	C_{iss}	V_{GS} = 0 V, V_{DS} = 25 V, f = 1.0 MHz	-	1900	-	pF
Output Capacitance	C_{oss}		-	230	-	
Reverse Transfer Capacitance	C_{rss}		-	24	-	
Total Gate Charge	Q_g	V_{GS} = 10 V; I_D = 16 A, V_{DS} = 400 V	-	45	68	nC
Gate-Source Charge	Q_{gs}		-	18	-	
Gate-Drain Charge	Q_{gd}		-	22	-	
Turn-On Delay Time	$t_{d(on)}$	V_{DD} = 250 V, I_D = 16 A, R_g = 9.1 Ω, V_{GS} = 10 V	-	27	-	ns
Rise Time	t_r		-	156	-	
Turn-Off Delay Time	$t_{d(off)}$		-	29	-	
Fall Time	t_f		-	31	-	
Gate Input Resistance	R_g	f = 1 MHz, open drain	-	1.6	-	Ω
Drain-Source Body Diode Characteristics						
Continuous Source-Drain Diode Current	I_S	MOSFET symbol showing the integral reverse p - n junction diode 	-	-	16	A
Pulsed Diode Forward Current	I_{SM}		-	-	30	
Body Diode Voltage	V_{SD}	T_J = 25 °C, I_S = 10 A, V_{GS} = 0 V	-	-	1.8	V
Body Diode Reverse Recovery Time	t_{rr}	T_J = 25 °C, I_F = I_S, dI/dt = 100 A/µs, V_R = 20 V	-	555	-	ns
Body Diode Reverse Recovery Charge	Q_{rr}		-	5.5	-	µC
Body Diode Reverse Recovery Current	I_{RRM}		-	18	-	A

Note

- The information shown here is a preliminary product proposal, not a commercial product data sheet. Vishay Siliconix is not committed to produce this or any similar product. This information should not be used for design purposes, nor construed as an offer to furnish or sell such products.

TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

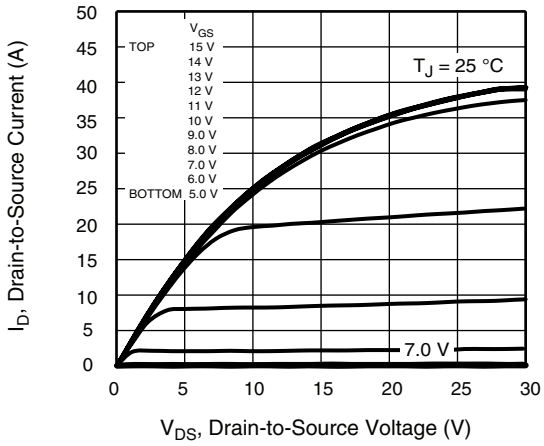


Fig. 1 - Typical Output Characteristics

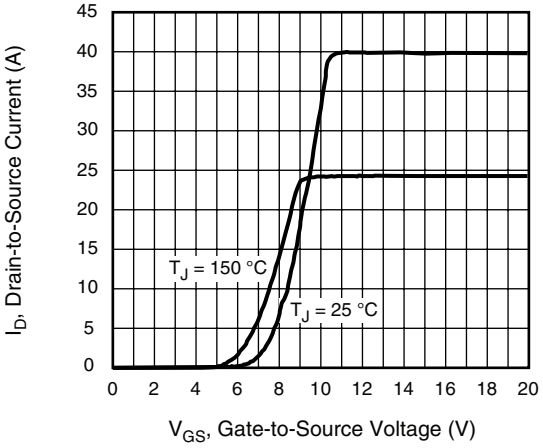


Fig. 3 - Typical Transfer Characteristics

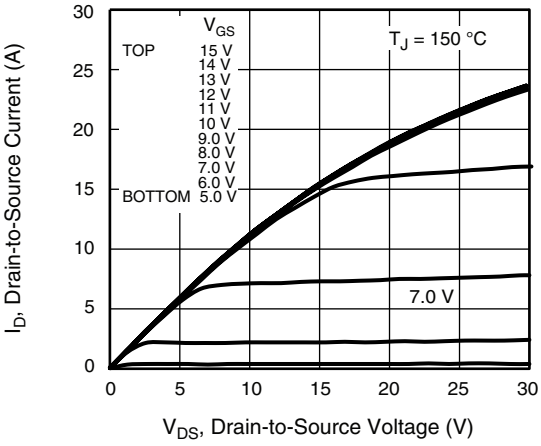


Fig. 2 - Typical Output Characteristics

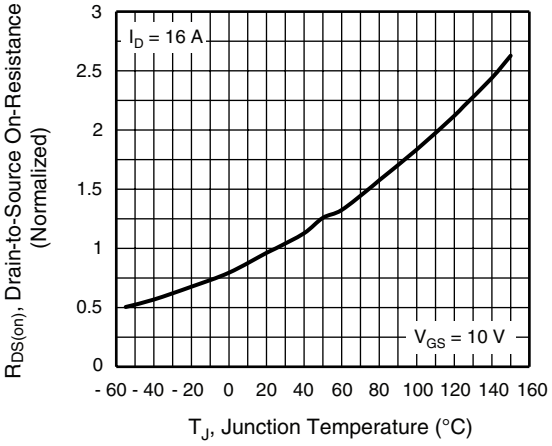


Fig. 4 - Normalized On-Resistance vs. Temperature

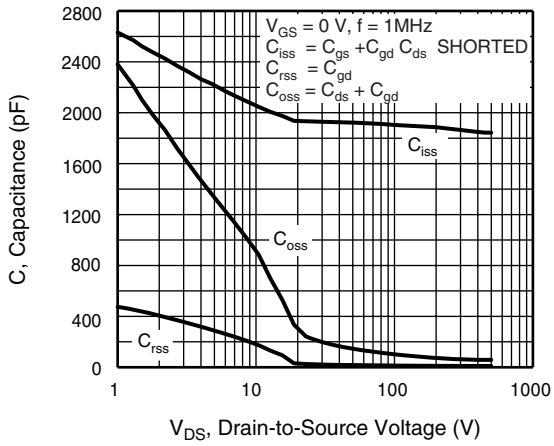


Fig. 5 - Typical Capacitance vs. Drain-to-Source Voltage

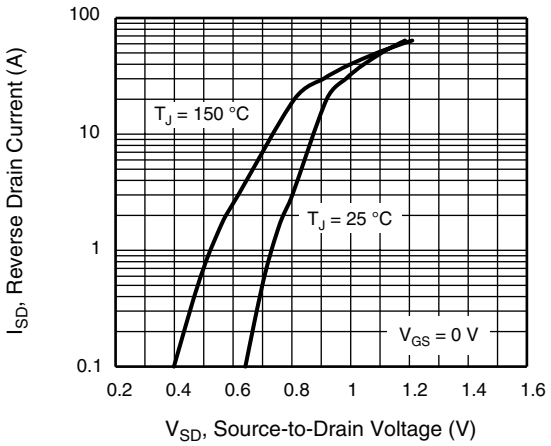


Fig. 7 - Typical Source-Drain Diode Forward Voltage

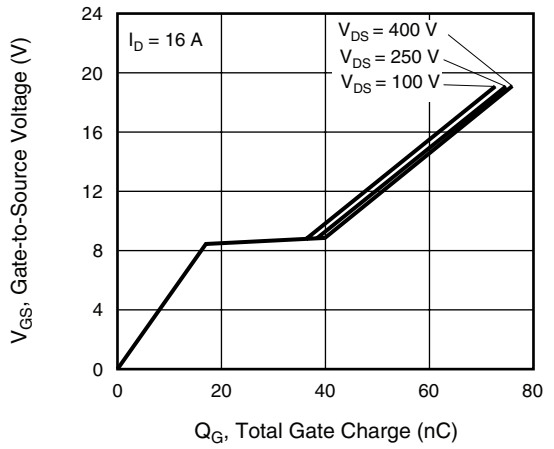


Fig. 6 - Typical Gate Charge vs. Gate-to-Source Voltage

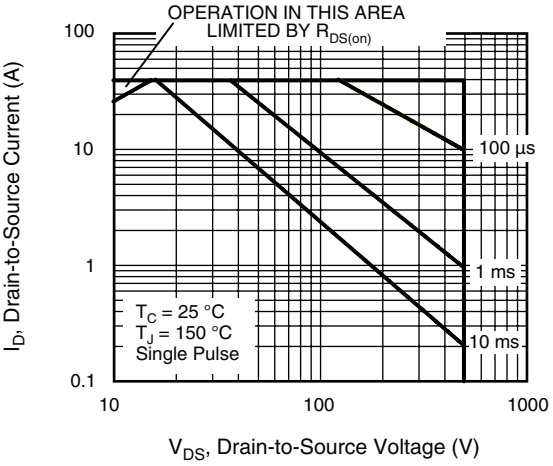


Fig. 8 - Maximum Safe Operating Area

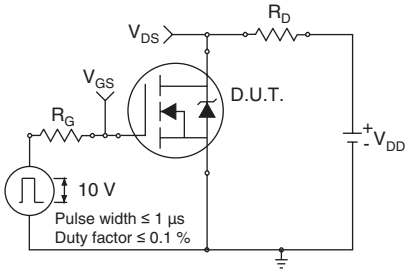


Fig. 9a - Switching Time Test Circuit

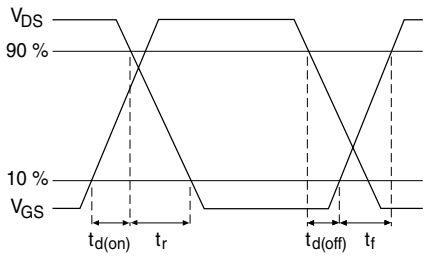


Fig. 9b - Switching Time Waveforms

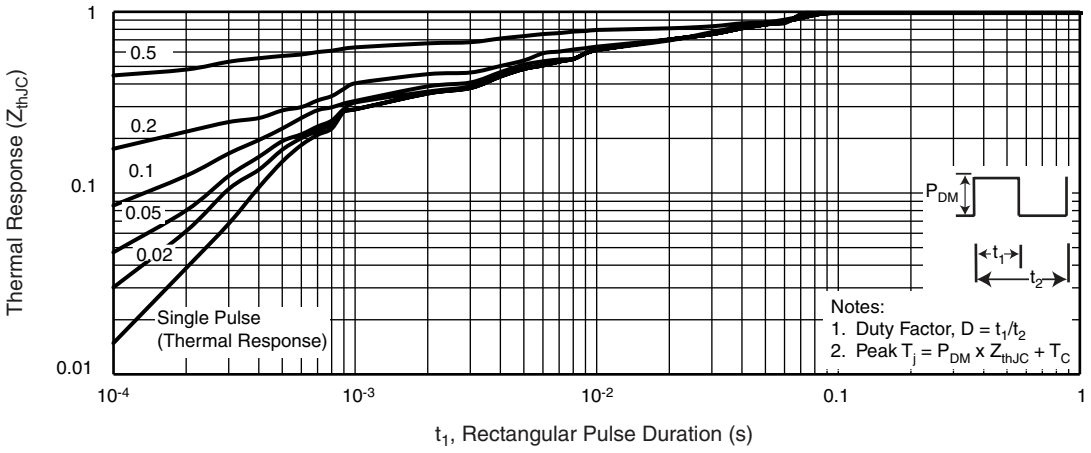


Fig. 10 - Maximum Effective Transient Thermal Impedance, Junction-to-Case

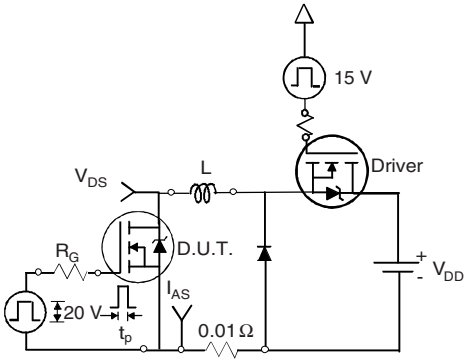


Fig. 11a - Unclamped Inductive Test Circuit

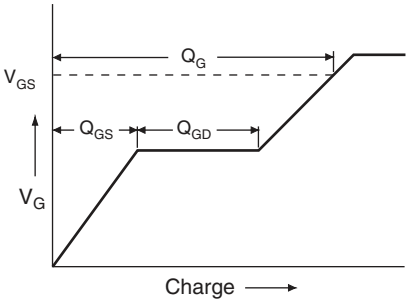


Fig. 12a - Basic Gate Charge Waveform

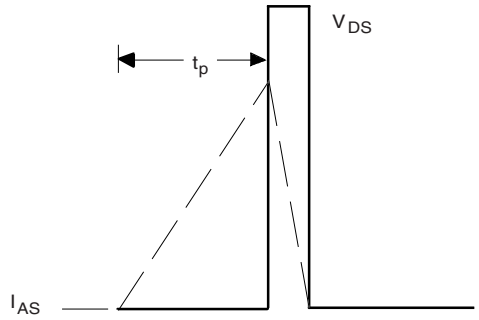


Fig. 11b - Unclamped Inductive Waveforms

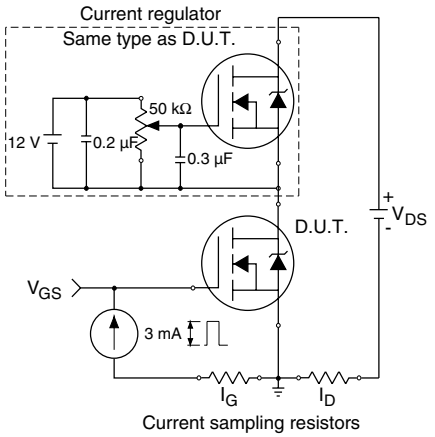
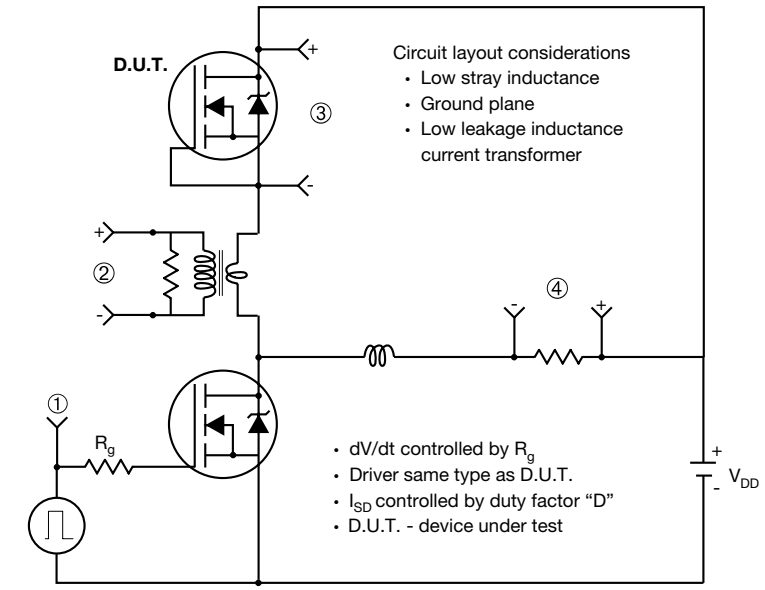
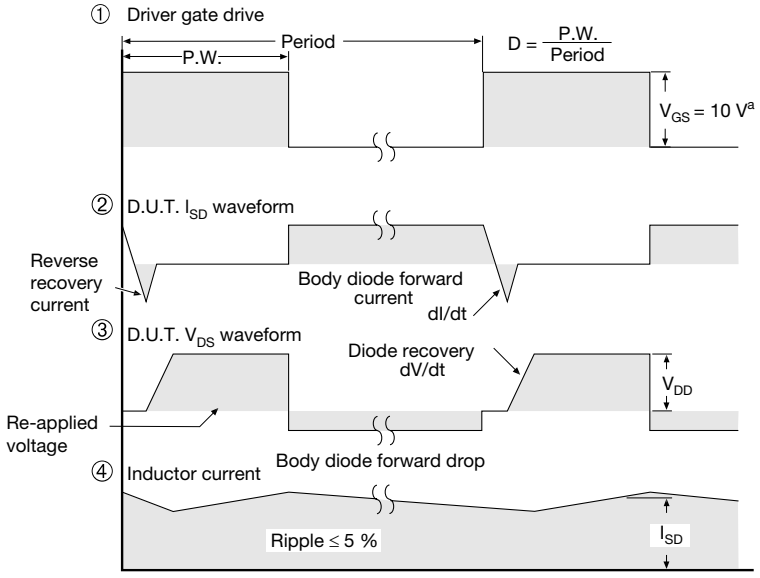


Fig. 12b - Gate Charge Test Circuit

Peak Diode Recovery dV/dt Test Circuit





Note

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

Fig. 13 - For N-Channel

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