

RoHS

COMPLIANT HALOGEN

FREE

Vishay Siliconix

Dual N-Channel 40-V MOSFET

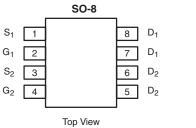
PRODUCT SUMMARY						
V _{DS} (V)	R _{DS(on)} (Ω)	I _D (A)	Q _g (Typ.)			
40	0.016 at V _{GS} = 10 V	8	56			
40	0.019 at V _{GS} = 4.5 V	= 4.5 V 8	50			

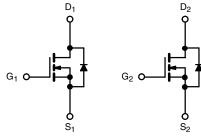
FEATURES

- Halogen-free According to IEC 61249-2-21 Available
- TrenchFET[®] Power MOSFET
- 100 % R_g Tested
- UIS Tested

APPLICATIONS

• CCFL Inverter







Ordering Information: Si4904DY-T1-E3 (Lead (Pb)-free) Si4904DY-T1-GE3 (Lead (Pb)-free and Halogen-free)

N-Channel MOSFET

N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS $T_A = 2$	25 °C, unless other	wise noted		
Parameter	Symbol	Limit	Unit	
Drain-Source Voltage	V _{DS}	40	v	
Gate-Source Voltage	V _{GS}	± 16	v	
	T _C = 25 °C		8	
Continuous Drain Current (T ₁ = 150 °C)	T _C = 70 °C	I_	8	
Continuous Drain Current (1) = 150°C)	T _A = 25 °C	I _D	8 ^{b, c}	
	T _A = 70 °C		6.5 ^{b, c}	
Pulsed Drain Current (10 µs Pulse Width)		I _{DM}	20	А
Source-Drain Current Diode Current	T _C = 25 °C	١ _S	2.7	A
Source-Drain Current Diode Current	T _A = 25 °C		1.6 ^{b, c}	
Pulsed Source-Drain Current	I _{SM}	20		
Single Pulse Avalanche Current		I _{AS}	20	
Single Pulse Avalanche Energy	L = 0.1 mH	E _{AS}	20	
	T _C = 25 °C		3.25	
Maximum Rowar Dissipation	T _C = 70 °C	PD	2.10	w
Maximum Power Dissipation	T _A = 25 °C	'D	2.0 ^{b, c}	· · ·
	T _A = 70 °C		1.25 ^{b, c}	Ī
Operating Junction and Storage Temperature Range	T _J , T _{stg}	- 55 to 150	°C	

THERMAL RESISTANCE RATINGS							
Parameter		Symbol	Тур.	Max.	Unit		
Maximum Junction-to-Ambient ^{b, d}	t ≤ 10 s	R _{thJA}	45	62.5	°C/W		
Maximum Junction-to-Foot (Drain)	Steady-State	R _{thJF}	29	38	0/11		

Notes:

a. Based on $T_C = 25$ °C.

b. Surface Mounted on 1" x 1" FR4 board.

c. t = 10 s. d. Maximum under steady state conditions is 120 °C/W.

Si4904DY

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Parameter	Symbol	Test Conditions	Min.	Тур.	Max.	Unit	
Static	-					1	
Drain-Source Breakdown Voltage	V _{DS}	V _{GS} = 0 V, I _D = 250 μA	40			V	
V _{DS} Temperature Coefficient	$\Delta V_{DS}/T_{J}$			40			
V _{GS(th)} Temperature Coefficient	$\Delta V_{GS(th)}/T_J$	I _D = 250 μA		- 4.8		mV/°C	
Gate Threshold Voltage	V _{GS(th)}	$V_{DS} = V_{GS}, I_{D} = 250 \ \mu A$	0.8		2.0	V	
Gate-Body Leakage	I _{GSS}	$V_{DS} = 0 V, V_{GS} = \pm 16 V$			100	nA	
	I _{DSS}	V _{DS} = 40 V, V _{GS} = 0 V			1		
Zero Gate Voltage Drain Current		V _{DS} = 40 V, V _{GS} = 0 V, T _J = 55 °C			10	μA	
On-State Drain Current ^b	I _{D(on)}	V _{DS} = 5 V, V _{GS} = 10 V	20			A	
		$V_{GS} = 10 \text{ V}, I_D = 5 \text{ A}$			0.016	+	
Drain-Source On-State Resistance ^b	R _{DS(on)}	$V_{GS} = 4.5 \text{ V}, \text{ I}_{D} = 4 \text{ A}$		0.015	0.019	Ω	
Forward Transconductance ^b	9 _{fs}	$V_{DS} = 15 \text{ V}, I_D = 5 \text{ A}$		23		S	
Dynamic ^a	0.0						
Input Capacitance	C _{iss}			2390	[
Output Capacitance	C _{oss}	N-Channel		270		pF	
Reverse Transfer Capacitance	C _{rss}	$V_{DS} = 20 \text{ V}, V_{GS} = 0 \text{ V}, I_{D} = 1 \text{ MHz}$		165			
	$V_{pq} = 20 \text{ V}$ $V_{qq} = 10 \text{ V}$ lp	V _{DS} = 20 V, V _{GS} = 10 V, I _D = 5 A		56	85		
Total Gate Charge	Qg			26	40	nC	
Gate-Source Charge	Q _{gs}	N-Channel		5.5			
Gate-Drain Charge	Q _{gd}	$V_{DS} = 20 \text{ V}, \text{ V}_{GS} = 4.5 \text{ V}, \text{ I}_{D} = 5 \text{ A}$		9.7			
Gate Resistance	R _g	f = 1 MHz		2.6	4.0		
Turn-On Delay Time	t _{d(on)}			15	23		
Rise Time	t _r	N-Channel		20	30	1	
Turn-Off Delay Time	t _{d(off)}	$V_{DD} = 20 \text{ V}, \text{ R}_{L} = 4 \Omega$		56	85		
Fall Time	t _f	$I_D \cong 5 \text{ A}, \text{ V}_{\text{GEN}} = 4.5 \text{ V}, \text{ R}_{\text{g}} = 1 \Omega$		10	15		
Turn-On Delay Time	t _{d(on)}			88	135	ns	
Rise Time	t _r	N-Channel		117	180	-	
Turn-Off Delay Time	t _{d(off)}	$V_{DD} = 20 \text{ V}, \text{ R}_{L} = 4 \Omega$		62	95		
Fall Time	t _f	$I_D \cong 5 \text{ A}, \text{ V}_{\text{GEN}} = 4.5 \text{ V}, \text{ R}_{\text{g}} = 1 \Omega$		19	30		
Drain-Source Body Diode Characterist		I I		-			
Continuous Source-Drain Diode Current	I _S	T _C = 25 °C			2.7	_	
Pulse Diode Forward Current ^a	I _{SM}				20	A	
Body Diode Voltage	V _{SD}	I _S = 1.5 A		0.69	1.2	V	
Body Diode Reverse Recovery Time	t _{rr}			62	95	ns	
Body Diode Reverse Recovery Charge	Q _{rr}	N-Channel		62	95	nC	
Reverse Recovery Fall Time	t _a	$I_F = 2 \text{ A}, \text{ dI/dt} = 100 \text{ A/}\mu\text{s}, T_J = 25 \text{ °C}$		26			
Reverse Recovery Rise Time	t _b			36		nS	

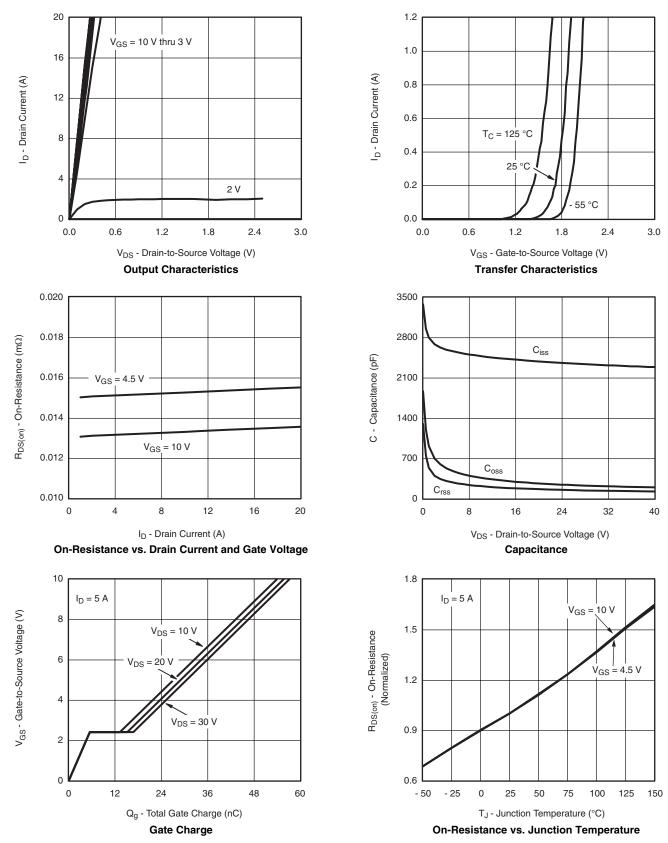
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.



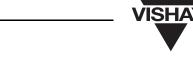
Si4904DY

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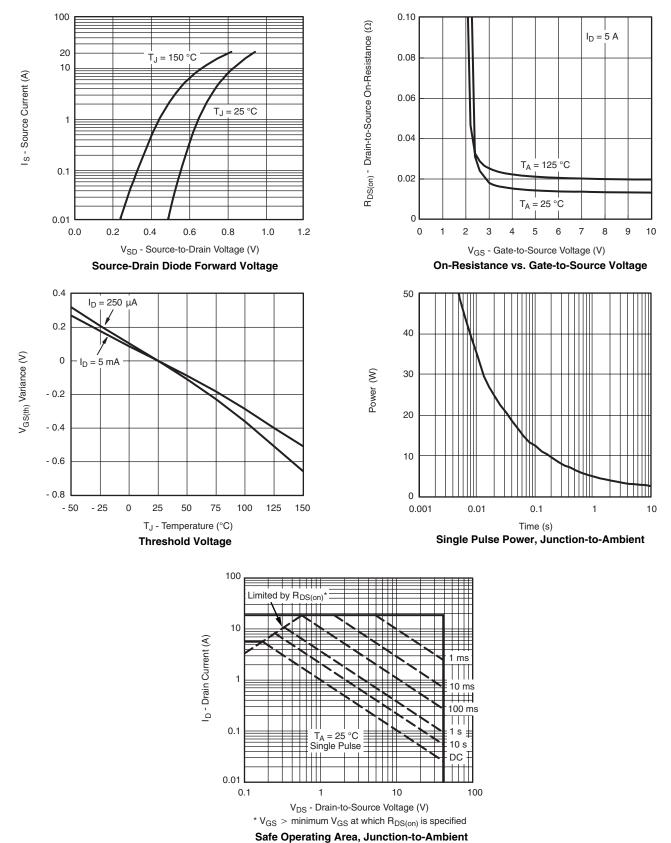




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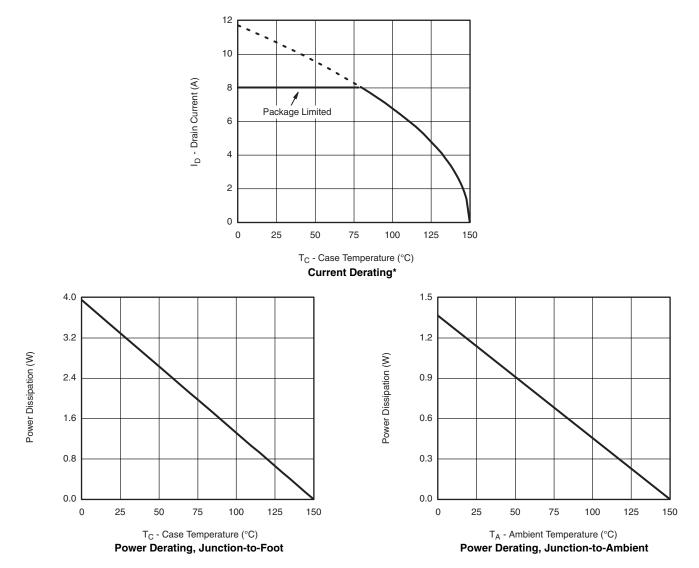


TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted

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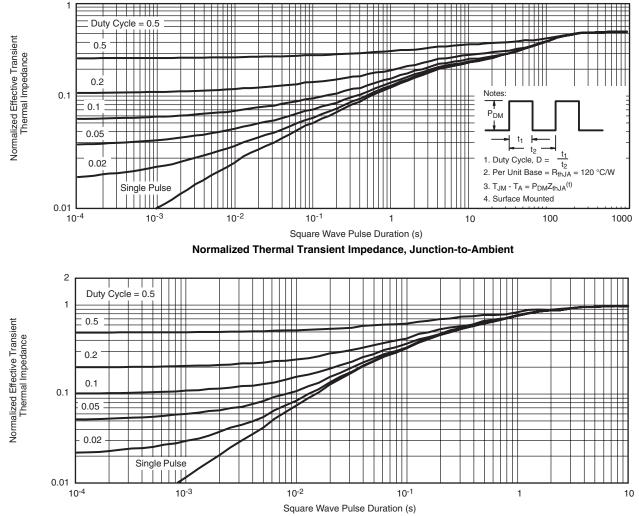


* The power dissipation P_D is based on $T_{J(max)}$ = 150 °C, using junction-to-case thermal resistance, and is more useful in settling the upper dissipation limit for cases where additional heatsinking is used. It is used to determine the current rating, when this rating falls below the package limit.



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TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



Normalized Thermal Transient Impedance, Junction-to-Case

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?73793.



Package Information

Vishay Siliconix

SOIC (NARROW): 8-LEAD JEDEC Part Number: MS-012





	MILLIM	IETERS	INCHES			
DIM	Min	Мах	Min	Max		
A	1.35	1.75	0.053	0.069		
A ₁	0.10	0.20	0.004	0.008		
В	0.35	0.51	0.014	0.020		
С	0.19	0.25	0.0075	0.010		
D	4.80	5.00	0.189	0.196		
E	3.80	4.00	0.150	0.157		
е	1.27 BSC		0.050 BSC			
н	5.80	6.20	0.228	0.244		
h	0.25	0.50	0.010	0.020		
L	0.50	0.93	0.020	0.037		
q	0°	8°	0°	8°		
S	0.44	0.64	0.018	0.026		
ECN: C-06527-Rev. I, 11-Sep-06 DWG: 5498						

Application Note 826

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RECOMMENDED MINIMUM PADS FOR SO-8



Recommended Minimum Pads Dimensions in Inches/(mm)

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