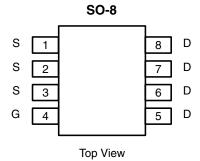




N-Channel 30 V (D-S) MOSFET with Schottky Diode

PRODUCT SUMMARY					
V _{DS} (V)	$R_{DS(on)}(\Omega)$	I _D (A) ^a	Q _g (Typ.)		
30	0.0095 at V _{GS} = 10 V	16	9.5 nC		
	0.0120 at V _{GS} = 4.5 V	15	9.5 110		



Ordering Information:

Si4774DY-T1-GE3 (Lead (Pb)-free and Halogen-free)

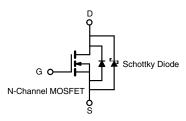
FEATURES

- Halogen-free According to IEC 61249-2-21 Definition
- SkyFET® Monolithic TrenchFET® Gen. III Power MOSFET and Schottky Diode
- 100 % R_g Tested 100 % UIS Tested
- Compliant to RoHS Directive 2002/95/EC

HALOGEN FREE

APPLICATIONS

- Notebook PC
 - System Power, Memory
- **Buck Converter**
- Synchronous Rectifier Switch



ABSOLUTE MAXIMUM RATINGS (T	$_{A}$ = 25 °C, unless othe	rwise noted)			
Parameter		Symbol	Limit	Unit	
Drain-Source Voltage		V_{DS}	30	W	
Gate-Source Voltage		V_{GS}	± 20	V	
	T _C = 25 °C		16		
Continuous Drain Current /T 150 °C)	T _C = 70 °C	l _D	13.6	A	
Continuous Drain Current (T _J = 150 °C)	T _A = 25 °C		12 ^{b, c}		
	T _A = 70 °C		9.6 ^{b, c}		
Pulsed Drain Current (t = 300 μs)		I _{DM}	50		
	T _C = 25 °C	1	4.5		
Continuous Source-Drain Diode Current	T _A = 25 °C	I _S	2.3 ^{b, c}	ı	
Single Pulse Avalanche Current		I _{AS}	15		
Single Pulse Avalanche Energy	L = 0.1 mH	E _{AS}	11.25	mJ	
	T _C = 25 °C		5		
Maniana Pana Piasiastian	T _C = 70 °C	В	3.2	١,,,	
Maximum Power Dissipation	T _A = 25 °C	P_{D}	2.5 ^{b, c}	W	
	T _A = 70 °C		1.6 ^{b, c}	1	
Operating Junction and Storage Temperature Range	T _J , T _{stg}	- 55 to 150	°C		

THERMAL RESISTANCE RATINGS							
Parameter		Symbol Typ.		Max.	Unit		
Maximum Junction- to-Ambient ^{b, d}	t ≤ 10 s	R _{thJA}	38	50	°C/W		
Maximum Junction- to-Foot (Drain)	Steady State	R _{thJF}	20	25	-C/W		

Notes:

- a. Based on T_C = 25 °C. b. Surface mounted on 1" x 1" FR4 board.
- d. Maximum under steady state conditions is 85 °C/W.

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Parameter	Symbol	Test Conditions	Min.	Тур.	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V_{DS}	V_{DS} $V_{GS} = 0$, $I_D = 1$ mA				V
Gate-Source Threshold Voltage	V _{GS(th)}	$V_{DS} = V_{GS}$, $I_D = 1 \text{ mA}$	1		2.3	V
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 _{DS} = 30 V, V _{GS} = 0 V		0.028	0.200	- mA
		V _{DS} = 30 V, V _{GS} = 0 V, T _J = 100 °C		2.5	20	
On -State Drain Current ^a	I _{D(on)}	$V_{DS} \ge 5 \text{ V}, V_{GS} = 10 \text{ V}$	30			Α
Davis Course On Olate Desisters of	Б	V _{GS} = 10 V, I _D = 10 A		0.0079	0.0095	Ω
Drain-Source On-State Resistance ^a	R _{DS(on)}	$V_{GS} = 4.5 \text{ V}, I_D = 7 \text{ A}$		0.0096	0.0120	
Forward Transconductance ^a	9 _{fs}	V _{DS} = 15 V, I _D = 10 A		43		S
Dynamic ^b						
Input Capacitance	C _{iss}			1025		pF
Output Capacitance	C _{oss}	$V_{DS} = 15 \text{ V}, V_{GS} = 0 \text{ V}, f = 1 \text{ MHz}$		251		
Reverse Transfer Capacitance	C _{rss}	1		100		
Total Cata Charge	Qg	V _{DS} = 15 V, V _{GS} = 10 V, I _D = 10 A		20.3	30.5	nC
Total Gate Charge				9.5	14.3	
Gate-Source Charge	Q_{gs}	$V_{DS} = 15 \text{ V}, V_{GS} = 4.5 \text{ V}, I_{D} = 10 \text{ A}$		2.8		
Gate-Drain Charge	Q_{gd}			3.2		
Gate Resistance	R_{g}	f = 1 MHz	0.3	1.0	2.0	Ω
Turn-On Delay Time	t _{d(on)}			11	22	
Rise Time	t _r	$V_{DD} = 15 \text{ V}, R_{L} = 1.5 \Omega$		22	48	
Turn-Off Delay Time	t _{d(off)}	$I_D \approx 10 \text{ A}, V_{GEN} = 4.5 \text{ V}, R_g = 1 \Omega$		13	26	
Fall Time	t _f			11	22	ns
Turn-On Delay Time	t _{d(on)}			8	16	115
Rise Time	t _r	V_{DD} = 15 V, R_L = 1.5 Ω		13	26	
Turn-Off Delay Time	t _{d(off)}	$I_D \cong 10 \text{ A}, V_{GEN} = 10 \text{ V}, R_g = 1 \Omega$		14	28	
Fall Time	t _f			9	18	
Drain-Source Body Diode and Schottky	Characterist					
Continuous Source-Drain Diode Current	I_S	T _C = 25 °C			4.5	Α
Pulse Diode Forward Current ^a	I _{SM}				50	
Body Diode Voltage	V_{SD}	I _S = 2 A		0.44	0.55	V
Body Diode Reverse Recovery Time	t _{rr}			18	35	ns
Body Diode Reverse Recovery Charge	Q _{rr}	I _F = 5 A, dl/dt = 100 A/μs, T _J = 25 °C		7.5	15	nC
Reverse Recovery Fall Time	t _a	$\frac{1}{1}$ $\frac{1}$		10		
Reverse Recovery Rise Time	t _b			8		ns

Notes:

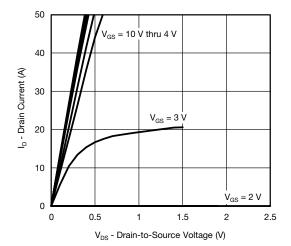
- a. Pulse test; pulse width \leq 300 μ s, duty cycle \leq 2 %.
- b. Guaranteed by design, not subject to production testing.

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.

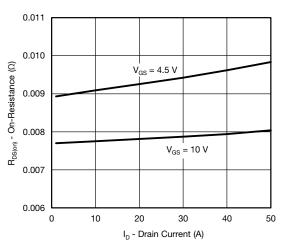




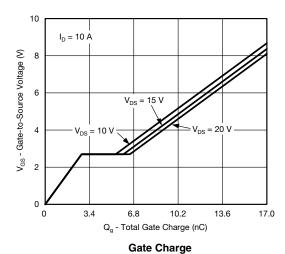
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

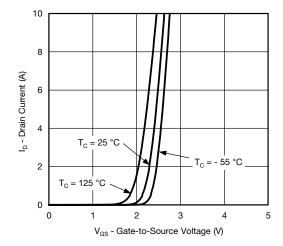


Output Characteristics

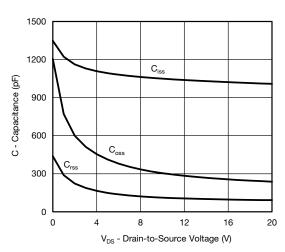


On-Resistance vs. Drain Current

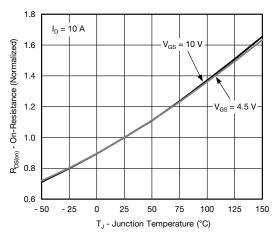




Transfer Characteristics



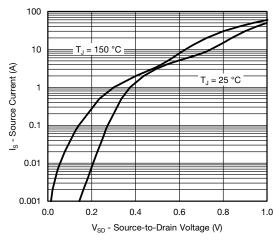
Capacitance



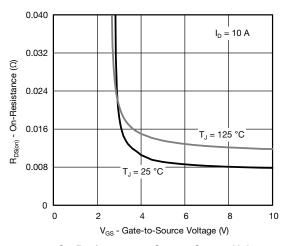
On-Resistance vs. Junction Temperature

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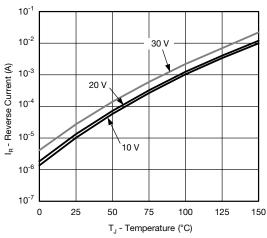
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



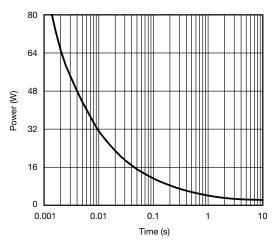
Source-Drain Diode Forward Voltage



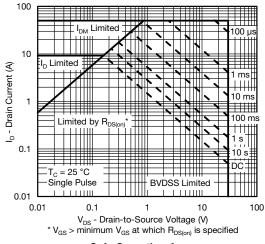
On-Resistance vs. Gate-to-Source Voltage



Reverse Current (Schottky)



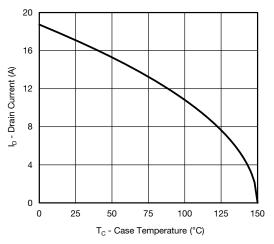
Single Pulse Power, Junction-to-Ambient



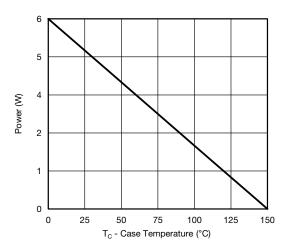
Safe Operating Area

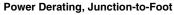


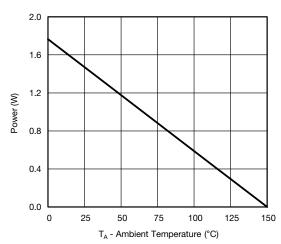
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



Current Derating*







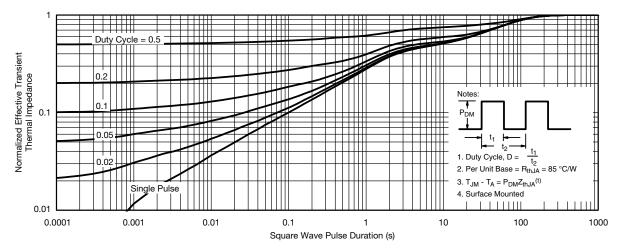
Power Derating, Junction-to-Ambient

^{*} 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.

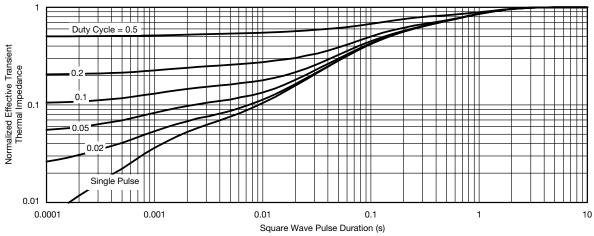
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TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



Normalized Thermal Transient Impedance, Junction-to-Ambient



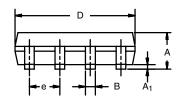
Normalized Thermal Transient Impedance, Junction-to-Foot

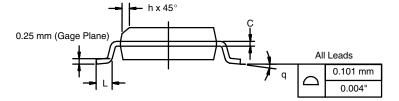
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SOIC (NARROW): 8-LEAD JEDEC Part Number: MS-012







	MILLIM	IETERS	INCHES			
DIM	Min	Max	Min	Max		
Α	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		
Е	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

Document Number: 71192 www.vishay.com 11-Sep-06

APPLICATION NOTE



RECOMMENDED MINIMUM PADS FOR SO-8



Recommended Minimum Pads Dimensions in Inches/(mm)

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