



N-Channel 150 V (D-S) MOSFET

PRODUCT SUMMARY						
V _{DS} (V)	$R_{DS(on)}(\Omega)$	I _D (A) ^a	Q _g (Typ.)			
150	0.045 at V _{GS} = 10 V	7.7	23 nC			
150	0.047 at V _{GS} = 8 V	7.5	23110			

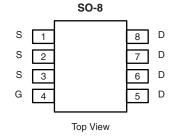
FEATURES

- Halogen-free According to IEC 61249-2-21 Definition
- Extremely Low Q_{gd} for Switching Losses
- 100 % R_g Tested
- 100 % Avalanche Tested
- Compliant to RoHS Directive 2002/95/EC



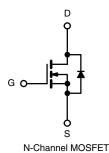
APPLICATIONS

· Primary Side Switch



Ordering Information: Si4472DY-T1-E3 (Lead (Pb)-free)

Si4472DY-T1-GE3 (Lead (Pb)-free and Halogen-free)



ABSOLUTE MAXIMUM RATIN	IGS (T _A = 25 °C	, unless oth	erwise noted)		
Parameter	Symbol	Limit	Unit		
Drain-Source Voltage	V_{DS}	150	V		
Gate-Source Voltage	V _{GS}	± 20			
	T _C = 25 °C		7.7		
Continuous Drain Current (T _J = 150 °C)	T _C = 70 °C		6.1		
Continuous Diain Current (1) = 150 C)	T _A = 25 °C	- I _D	5.5 ^{b, c}		
	T _A = 70 °C	†	4.5 ^{b, c}	Α	
Pulsed Drain Current		I _{DM}	50	^	
Continuous Source-Drain Diode Current	T _C = 25 °C		4.5		
Continuous Source-Diam Diode Current	T _A = 25 °C	I _S	2.6 ^{b, c}		
Single Pulse Avalanche Current Single Pulse Avalanche Energy L = 0.1 mH		I _{AS}	20		
		E _{AS}	20	mJ	
	T _C = 25 °C		5.9		
Maximum Power Dissipation	T _C = 70 °C	1 5	3.8	w	
Maximum Power Dissipation	T _A = 25 °C	P _D	3.1 ^{b, c}	VV	
	T _A = 70 °C	1	2 ^{b, c}		
Operating Junction and Storage Temperatur	T _J , T _{stg}	- 55 to 150	°C		

THERMAL RESISTANCE RATINGS							
Parameter	Symbol	Typical	Maximum	Unit			
Maximum Junction-to-Ambient ^{b, †}	t ≤ 10 s	R_{thJA}	33	40	°C/W		
Maximum Junction-to-Foot (Drain)	Steady State	R_{thJF}	17	21	O/ VV		

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 80 °C/W.

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Parameter	Symbol	Test Conditions	Min.	Тур.	Max.	Unit	
Static	-					l .	
Drain-Source Breakdown Voltage	V _{DS}	$V_{GS} = 0 \text{ V}, I_D = 250 \mu\text{A}$	150			V	
V _{DS} Temperature Coefficient	$\Delta V_{DS}/T_{J}$			172		mV/°C	
V _{GS(th)} Temperature Coefficient	$\Delta V_{GS(th)}/T_{J}$	$I_D = 250 \mu A$		- 10			
Gate-Source Threshold Voltage	V _{GS(th)}	$V_{DS} = V_{GS}$, $I_{D} = 250 \mu A$	2.5		4.5	V	
Gate-Source Leakage	I _{GSS}	$V_{DS} = 0 \text{ V}, V_{GS} = \pm 20 \text{ V}$			± 100	nA	
Zava Cata Valtaga Drain Current		V _{DS} = 150 V, V _{GS} = 0 V			1		
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 150 V, V _{GS} = 0 V, T _J = 55 °C			10	μΑ	
On-State Drain Current ^a	I _{D(on)}	$V_{DS} \ge 10 \text{ V}, V_{GS} = 10 \text{ V}$	30			Α	
Drain-Source On-State Resistance ^a	В	$V_{GS} = 10 \text{ V}, I_D = 5 \text{ A}$		0.036	0.045	0.045 Ω	
Diani-Source On-State nesistance"	R _{DS(on)}	$V_{GS} = 8 \text{ V}, I_{D} = 5 \text{ A}$		0.0375	0.047	22	
Forward Transconductance ^a	9 _{fs}	V _{DS} = 15 V, I _D = 5 A		23		S	
Dynamic ^b							
Input Capacitance	C _{iss}			1735		pF	
Output Capacitance	C _{oss}	$V_{DS} = 50 \text{ V}, V_{GS} = 0 \text{ V}, f = 1 \text{ MHz}$		160			
Reverse Transfer Capacitance	C _{rss}			37			
Total Gate Charge	Q _g	$V_{DS} = 75 \text{ V}, V_{GS} = 10 \text{ V}, I_D = 5 \text{ A}$		28.5	43	nC	
Total Gate Charge				23	35		
Gate-Source Charge	Q_{gs}	$V_{DS} = 75 \text{ V}, V_{GS} = 8 \text{ V}, I_{D} = 5 \text{ A}$		8			
Gate-Drain Charge	Q_{gd}			6.5			
Gate Resistance	R_{g}	f = 1 MHz		0.85	1.3	Ω	
Turn-on Delay Time	t _{d(on)}			14	21		
Rise Time	t _r	V_{DD} = 50 V, R_L = 10 Ω		12	18		
Turn-Off Delay Time	t _{d(off)}	$I_D \cong 5$ A, $V_{GEN} = 10$ V, $R_g = 1$ Ω		22	33		
Fall Time	t _f			6	10	l no	
Turn-On Delay Time	t _{d(on)}			16	24	ns -	
Rise Time	t _r	V_{DD} = 50 V, R_L = 10 Ω		12	18		
Turn-Off Delay Time	t _{d(off)}	$I_D \cong 5 \text{ A}, V_{GEN} = 8 \text{ V}, R_g = 1 \Omega$		20	30		
Fall Time	t _f			7	12		
Drain-Source Body Diode Characteristic	cs						
Continuous Source-Drain Diode Current	I _S	T _C = 25 °C			7.7		
Pulse Diode Forward Current ^a	I _{SM}				50	Α	
Body Diode Voltage	V _{SD}	I _S = 2.6 A		0.77	1.2	V	
Body Diode Reverse Recovery Time	t _{rr}			63	95	ns	
Body Diode Reverse Recovery Charge	Q _{rr}	L = 5 A dl/dt = 100 A/up T = 05 °C		110	165	nC	
Reverse Recovery Fall Time	t _a	$I_F = 5 \text{ A}, \text{ dI/dt} = 100 \text{ A/}\mu\text{s}, T_J = 25 ^{\circ}\text{C}$		49			
Reverse Recovery Rise Time	t _b			14		ns	

Notes:

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.

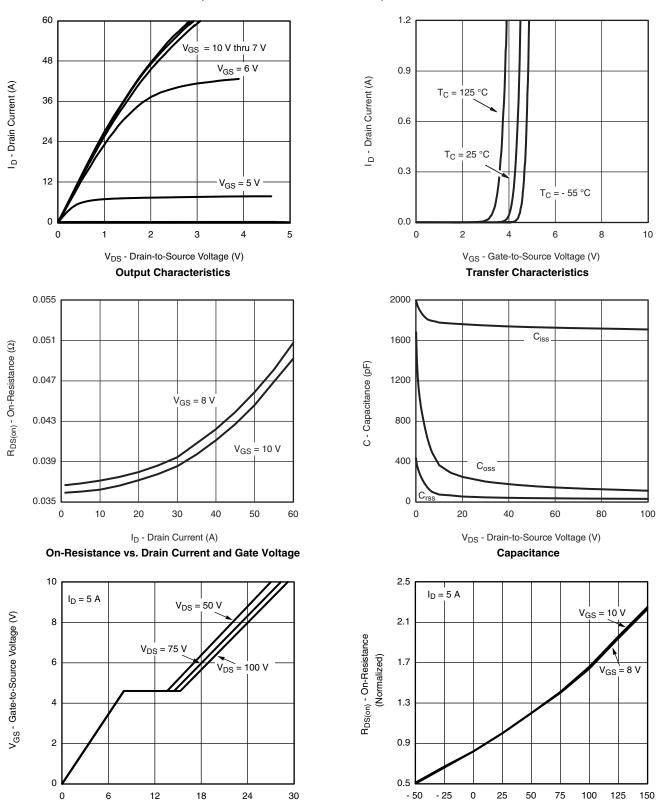
a. Pulse test; pulse width $\leq 300~\mu s,$ duty cycle $\leq 2~\%$

a. Guaranteed by design, not subject to production testing.





TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



Q_g - Total Gate Charge (nC)

Gate Charge

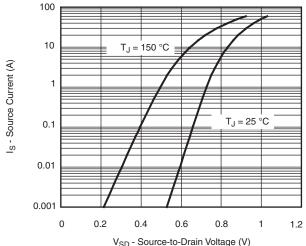
T_J - Junction Temperature (°C)

On-Resistance vs. Junction Temperature

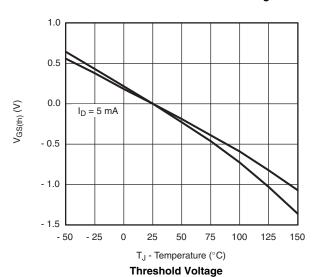
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TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)

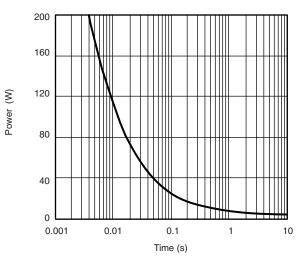


Source-Drain Diode Forward Voltage

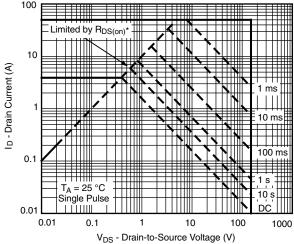


0.20 $\mathsf{R}_{\mathsf{DS}(\mathsf{on})}$ - Drain-to-Source On-Resistance (Ω) $I_D = 5 A$ 0.16 0.12 T_J = 125 °C 0.08 $T_J = 25$ °C 0.04 0.00 2 4 6 10 0 V_{GS} - Gate-to-Source Voltage (V)

On-Resistance vs. Gate-to-Source Voltage



Single Pulse Power, Junction-to-Ambient



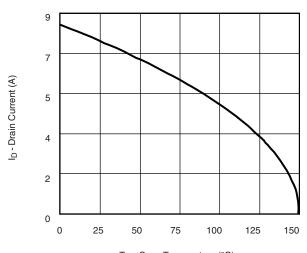
* V_{GS} > minimum V_{GS} at which $R_{DS(on)}$ is specified

Safe Operating Area, Junction-to-Ambient



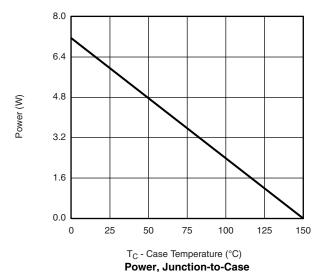


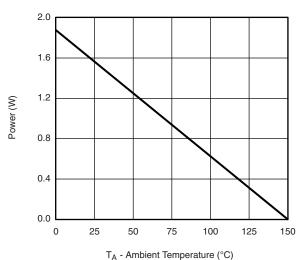
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



 $T_{\mbox{\scriptsize C}}$ - Case Temperature (°C)

Current Derating*





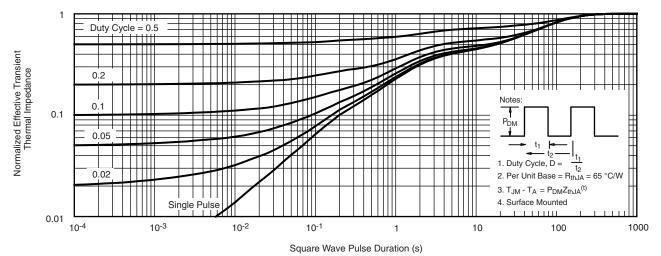
Power, Junction-to-Ambient

^{*} 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.

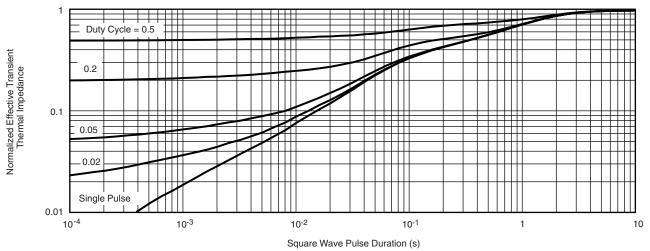
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TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



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	INC	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		
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RECOMMENDED MINIMUM PADS FOR SO-8



Recommended Minimum Pads Dimensions in Inches/(mm)

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