

SI4435DY-T1-E3-VB Datasheet P-Channel 30-V (D-S) MOSFET

PRODUCT SUMMARY						
V _{DS} (V)	$R_{DS(on)}\left(\Omega\right)$	I _D (A) ^d	Q _g (Typ.)			
- 30	0.018 at V _{GS} = - 10 V	- 9.0	13 nC			
- 30	0.024 at V _{GS} = - 4.5 V	- 7.8	13110			

FEATURES

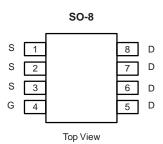
- Halogen-free According to IEC 61249-2-21 Definition
- Trench Power MOSFET
- 100 % R_g Tested

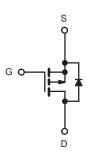
Pb-free RoHS

ROHS COMPLIANT HALOGEN FREE

APPLICATIONS

- Load Switch
- · Battery Switch





P-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS T	A = 25 °C, unless other	erwise noted		
Parameter	Symbol	Limit	Unit	
Drain-Source Voltage	V _{DS}	- 30	V	
Gate-Source Voltage	V _{GS}	± 20	V	
	T _C = 25 °C		- 9.0	
Continuous Drain Current (T _{.I} = 150 °C)	T _C = 70 °C	1 , —	- 7.2	
Continuous Diam Current (1) = 150 °C)	T _A = 25 °C	I _D	- 7.0 ^{a, b}	
	T _A = 70 °C		- 5.6 ^{a, b}	Α
Pulsed Drain Current	I _{DM}	- 30		
Continuous Course Drain Diada Correct	T _C = 25 °C		- 3.5	
Continuous Source-Drain Diode Current	T _A = 25 °C	I _S	- 2.1 ^{a, b}	
	T _C = 25 °C		4.2	
	T _C = 70 °C		2.7	14/
Maximum Power Dissipation	T _A = 25 °C	P _D	2.5 ^{a, b}	W
	T _A = 70 °C		1.6 ^{a, b}	
Operating Junction and Storage Temperature Range	T _J , T _{stq}	- 55 to 150	°C	

THERMAL RESISTANCE RATINGS						
Parameter		Symbol	Typical	Maximum	Unit	
Maximum Junction-to-Ambient ^{a, c}	t ≤ 10 s	R _{thJA}	40	50	°C/W	
Maximum Junction-to-Foot	Steady State	R _{thJF}	24	30	C/VV	

Notes:

- a. Surface mounted on 1" x 1" FR4 board.
- b. t = 10 s.
- c. Maximum under Steady State conditions is 95 °C/W.
- d. Based on $T_C = 25$ °C.



Parameter	Symbol	Test Conditions	Min.	Тур.	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V_{DS}	$V_{GS} = 0 \text{ V, } I_{D} = -250 \mu\text{A}$	- 30			V
V _{DS} Temperature Coefficient	$\Delta V_{DS}/T_{J}$	I _D = - 250 μA		- 31		mV/°C
V _{GS(th)} Temperature Coefficient	$\Delta V_{GS(th)}/T_J$	- ΙΒ = - 230 μΑ		4.5		mv/·C
Gate-Source Threshold Voltage	V _{GS(th)}	$V_{DS} = V_{GS}, I_{D} = -250 \mu A$	- 1.0		- 2.5	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			- 1	
Zero Gate voltage Drain Current		V _{DS} = - 30 V, V _{GS} = 0 V, T _J = 55 °C			- 5	μA
On-State Drain Current ^a	I _{D(on)}	$V_{DS} \le -5 \text{ V}, V_{GS} = -10 \text{ V}$	- 20			Α
David Course Co Otata Basista and	_	V _{GS} = - 10 V, I _D = - 7.0 A		0.018		0
Drain-Source On-State Resistance ^a	R _{DS(on)}	V _{GS} = - 4.5 V, I _D = - 5.6 A		0.024		Ω
Forward Transconductance ^a	9 _{fs}	V _{DS} = - 15 V, I _D = - 7.0 A		18		S
Dynamic ^b						•
Input Capacitance	C _{iss}			1455		pF
Output Capacitance	C _{oss}	$V_{DS} = -15 \text{ V}, V_{GS} = 0 \text{ V}, f = 1 \text{ MHz}$		180		
Reverse Transfer Capacitance	C _{rss}			145		
T. 10 . 0	Q_g $V_{DS} = -15 \text{ V}, V_{GS} = -10 \text{ V}, I_D = -7.0 \text{ A}$	$V_{DS} = -15 \text{ V}, V_{GS} = -10 \text{ V}, I_{D} = -7.0 \text{ A}$	25	38		
Total Gate Charge			13	20		
Gate-Source Charge	Q_{gs}	$V_{DS} = -15 \text{ V}, V_{GS} = -4.5 \text{ V}, I_{D} = -7.0 \text{ A}$		3.5		- nC
Gate-Drain Charge	Q _{gd}			5.5		
Gate Resistance	R _g	f = 1 MHz	0.4	2.0	4.0	Ω
Turn-On Delay Time	t _{d(on)}			10	20	
Rise Time	t _r	$V_{DD} = -15 \text{ V}, R_{L} = 2.7 \Omega$		13	20	
Turn-Off DelayTime	t _{d(off)}	$I_D \cong -5.6 \text{ A}, V_{GEN} = -10 \text{ V}, R_g = 1 \Omega$		23	35	
Fall Time	t _f]		9	18	
Turn-On Delay Time	t _{d(on)}			38	57	ns
Rise Time	t _r	$V_{DD} = -15 \text{ V}, R_{L} = 2.7 \Omega$		89	134	
Turn-Off DelayTime	t _{d(off)}	$I_{D} \cong -5.6 \text{ A}, V_{GEN} = -4.5 \text{ V}, R_{g} = 1 \Omega$		22	33	
Fall Time	t _f]		11	17]
Drain-Source Body Diode Characteris	tics					
Continous Source-Drain Diode Current	I _S	T _C = 25 °C			- 6.5	Λ.
Pulse Diode Forward Current	I _{SM}				- 30	A
Body Diode Voltage	V _{SD}	I _S = - 5.6 A, V _{GS} = 0 V		- 0.71	- 1.2	V
Body Diode Reverse Recovery Time	t _{rr}			22	33	ns
Body Diode Reverse Recovery Charge	Q _{rr}	1 - F.C.A. dl/dt - 100 A/v.o. T		17	26	nC
Reverse Recovery Fall Time	t _a	$I_F = -5.6 \text{ A}, \text{ dI/dt} = 100 \text{ A/}\mu\text{s}, T_J = 25 ^{\circ}\text{C}$		13		ns
Reverse Recovery Rise Time	t _b	1		9		

Notes:

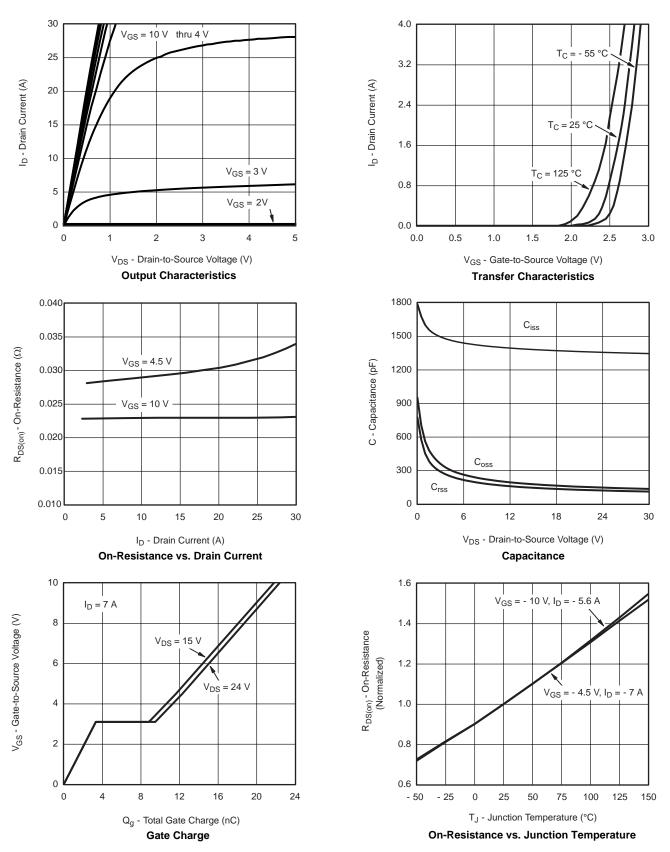
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure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

服务热线:400-655-8788 2

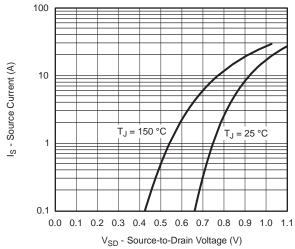
a. Pulse test; pulse width $\leq 300~\mu s,$ duty cycle $\leq 2~\%.$

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

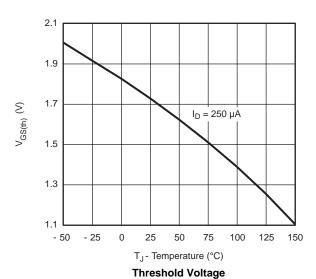








Source-Drain Diode Forward Voltage



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0.05 & & & & & & \\
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0.04 & & & & & \\
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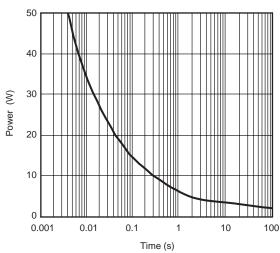
 $\label{eq:VGS} V_{GS} \mbox{ - Gate-to-Source Voltage (V)} \\$ On-Resistance vs. Gate-to-Source Voltage

12

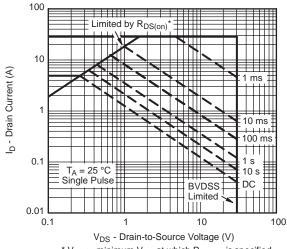
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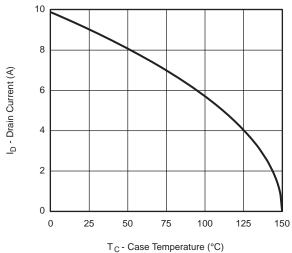
Single Pulse Power, Junction-to-Ambient



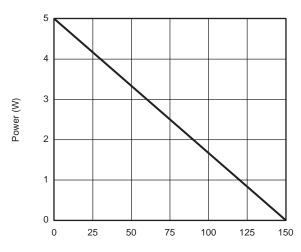
 * VGS > minimum VGS at which RDS(on) is specified

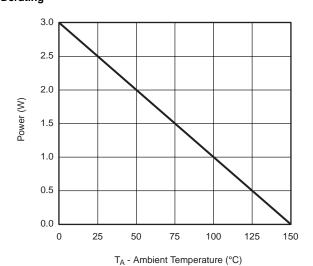
Safe Operating Area





Current Derating*





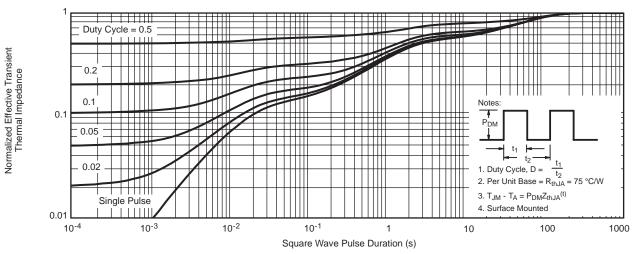
T_C - Case Temperature (°C)

Power, Junction-to-Foot

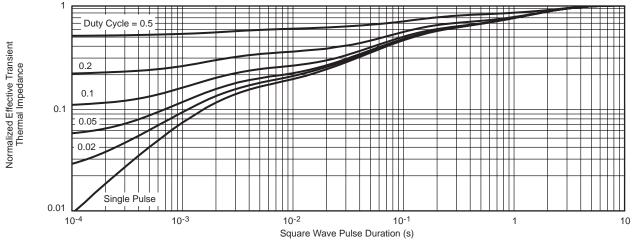
Power Derating, Junction-to-Ambient

^{*} 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.





Normalized Thermal Transient Impedance, Junction-to-Ambient

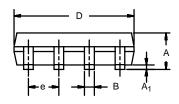


Normalized Thermal Transient Impedance, Junction-to-Foot



SOIC (NARROW): 8-LEADJEDEC Part Number: MS-012







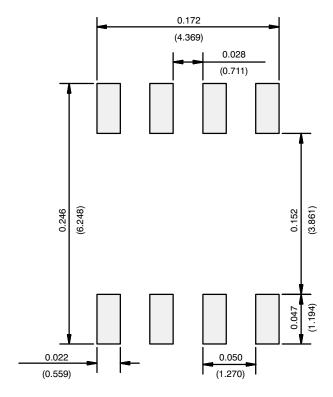
	MILLIN	IETERS	INCHES			
DIM	Min	Max	Min	Max		
Α	1.35	1.75	0.053	0.069		
A ₁	0.10	0.20	0.004	0.008		
В	0.35	0.51	0.014	0.020		
С	0.19	0.25	0.0075	0.010		
D	4.80	5.00	0.189	0.196		
E	3.80	4.00	0.150	0.157		
е	1.27	BSC 0.050 BSC) BSC		
Н	5.80	6.20	0.228	0.244		
h	0.25	0.50	0.010	0.020		
L	0.50	0.93	0.020	0.037		
q	0°	8°	0°	8°		
S	0.44	0.64	0.018	0.026		
FCN: C-06527-Pay I 11-San-06						

ECN: C-06527-Rev. I, 11-Sep-06

DWG: 5498



RECOMMENDED MINIMUM PADS FOR SO-8



Recommended Minimum Pads Dimensions in Inches/(mm)



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