

AM4940N-T1-PF-VB Datasheet Dual N-Channel 30 V (D-S) MOSFET

PRODUCT SUMMARY					
V _{DS} (V)	$R_{DS(on)}\left(\Omega\right)$	I _D (A) ^a	Q _g (Typ.)		
30	0.016 at V _{GS} = 10 V	8.5	7.1		
30	0.020 at V _{GS} = 4.5 V	7.6	7.1		

FEATURES

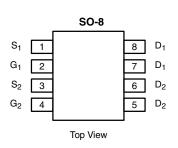
- Trench Power MOSFET
- 100 % R_g Tested
- 100 % UIS Tested
- Compliant to RoHS Directive 2002/95/EC

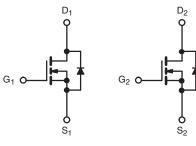


ROHS COMPLIANT

APPLICATIONS

- Notebook System Power
- Low Current DC/DC





N-Channel MOSFET

N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS (TA	$_{\rm A}$ = 25 °C, unless othe	rwise noted)			
Parameter	Symbol	Limit	Unit		
Drain-Source Voltage	V_{DS}	30	V		
Gate-Source Voltage	V_{GS}	± 20	V		
	T _C = 25 °C		8.5		
Continuous Drain Current (T _{.1} = 150 °C)	T _C = 70 °C	I _D	7.5		
Continuous Diam Current (1) = 130 °C)	T _A = 25 °C	ď	7.2 ^{b, c}		
	T _A = 70 °C		5.9 ^{b, c}		
Pulsed Drain Current		I _{DM}	30	Α	
Source-Drain Current Diode Current	T _C = 25 °C	I _S	2.8	7	
Source-Drain Guitent Diode Guitent	T _A = 25 °C	'S	1.8 ^{b, c}		
Pulsed Source-Drain Current	I _{SM}	30			
Single Pulse Avalanche Current L = 0.1 mH		I _{AS}	10		
Single Pulse Avalanche Energy	L = 0.1 IIII1	E _{AS}	5		
	T _C = 25 °C		3.1		
Maximum Power Discination	T _C = 70 °C	P _D	2.0	w	
Maximum Power Dissipation	T _A = 25 °C	' D	2.0 ^{b, c}		
	T _A = 70 °C		1.25 ^{b, c}		
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}	52	62.5	°C/W		
Maximum Junction-to-Foot (Drain)	Steady-State	R_{thJF}	30	40	7 5,,,		

Notes:

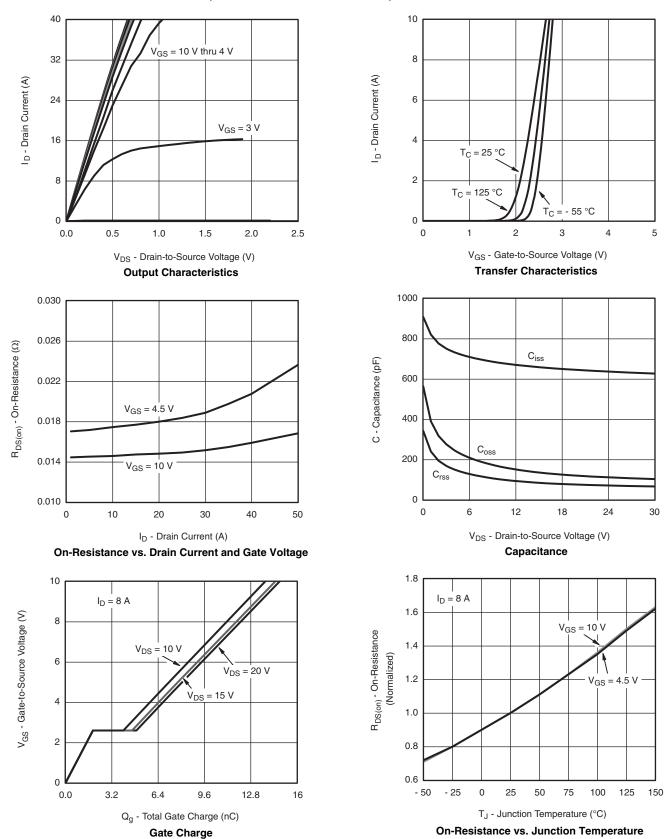
- a. Based on T_C = 25 °C.
- b. Surface mounted on 1" x 1" FR4 board.
- c. t = 10 s.
- d. Maximum under steady state conditions is 110 °C/W.



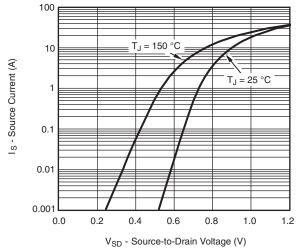
Parameter	Symbol	Test Conditions	Min.	Тур.	Max.	Unit	
Static	•	,					
Drain-Source Breakdown Voltage	V _{DS}	$V_{GS} = 0 \text{ V}, I_D = 250 \mu\text{A}$	30			V	
V _{DS} Temperature Coefficient	$\Delta V_{DS}/T_J$ $I_D = 250 \mu A$			3.0			
V _{GS(th)} Temperature Coefficient	$\Delta V_{GS(th)}/T_J$	I _D = 250 μA		- 5.2		mV/°C	
Gate Threshold Voltage	V _{GS(th)}	$V_{DS} = V_{GS}, I_{D} = 250 \mu A$	1.2		2.5	V	
Gate-Body Leakage	I _{GSS}	$V_{DS} = 0 \text{ V}, V_{GS} = \pm 20 \text{ V}$			100	nA	
7 0		V _{DS} = 30 V, V _{GS} = 0 V			1		
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 30 V, V _{GS} = 0 V, TJ = 55 °C			10	μΑ	
On -State Drain Current ^b	I _{D(on)}	V _{DS} = 5 V, V _{GS} = 10 V	20			Α	
h	_	V _{GS} = 10 V, I _D = 8 A		0.016		1	
Drain-Source On-State Resistance ^D	R _{DS(on)}	V _{GS} = 4.5 V, I _D = 5 A		0.020		Ω	
Forward Transconductance ^b	9 _{fs}	V _{DS} = 15 V, I _D = 8 A		27		S	
Dynamic ^a		<u> </u>					
Input Capacitance	C _{iss}			660			
Output Capacitance	C _{oss}	V _{DS} = 15 V, V _{GS} = 0 V, I _D = 1 MHz		140		pF	
Reverse Transfer Capacitance	C _{rss}	1 -		86			
Total Gate Charge		V _{DS} = 15 V, V _{GS} = 10 V, I _D = 8 A		14.5	22		
				7.1	11		
Gate-Source Charge	Q_{gs}	$V_{DS} = 15 \text{ V}, V_{GS} = 4.5 \text{ V}, I_{D} = 8 \text{ A}$		1.9		nC	
Gate-Drain Charge	Q_{gd}]		2.7			
Gate Resistance	R_{g}	f = 1 MHz	0.5	2.6	5.2	Ω	
Turn-On Delay Time	t _{d(on)}			14	28		
Rise Time	t _r	$V_{DD} = 15 \text{ V}, R_L = 3 \Omega$		45	80		
Turn-Off Delay Time	t _{d(off)}	$I_D \cong 5 \text{ A}, V_{GEN} = 4.5 \text{ V}, R_g = 1 \Omega$		18	35		
Fall Time	t _f]		12	24		
Turn-On Delay Time	t _{d(on)}			7	14	ns	
Rise Time	t _r	V_{DD} = 15 V, R_L = 3 Ω		10	20		
Turn-Off Delay Time	t _{d(off)}	$I_D \cong 5 \text{ A}, V_{GEN} = 10 \text{ V}, R_g = 1 \Omega$		15	30		
Fall Time	t _f	j		7	14		
Drain-Source Body Diode Characterist	ics						
Continuous Source-Drain Diode Current	I _S	T _C = 25 °C			2.8	^	
Pulse Diode Forward Current ^a	I _{SM}				30	A	
Body Diode Voltage	V _{SD}	I _S = 2 A		0.77	1.1	V	
Body Diode Reverse Recovery Time	t _{rr}			17	34	ns	
Body Diode Reverse Recovery Charge	Q _{rr}	1		9	18	nC	
Reverse Recovery Fall Time	t _a	$I_F = 5 \text{ A}, \text{ dI/dt} = 100 \text{ A/}\mu\text{s}, T_J = 25 ^{\circ}\text{C}$		10		_	
Reverse Recovery Rise Time				7		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.

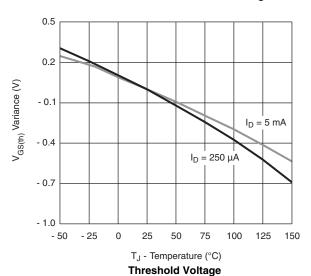




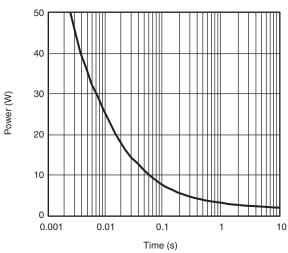




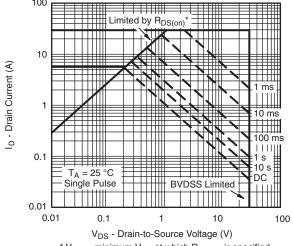
Source-Drain Diode Forward Voltage



On-Resistance vs. Gate-to-Source Voltage



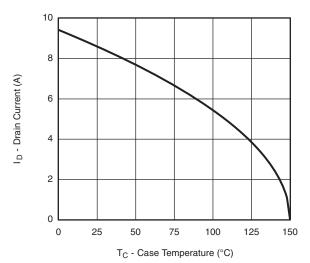
Single Pulse Power, Junction-to-Ambient



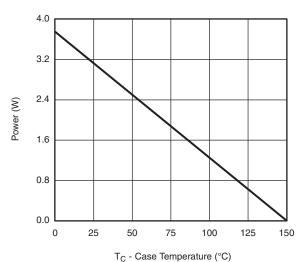
* V_{GS} > minimum V_{GS} at which R_{DS(on)} is specified

Safe Operating Area, Junction-to-Ambient

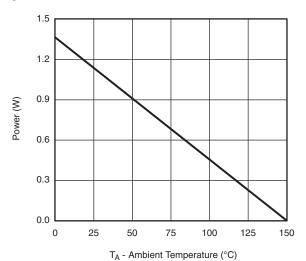




Current Derating*



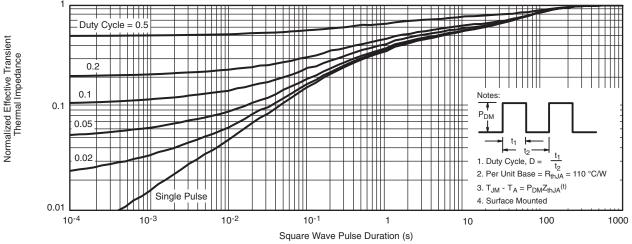




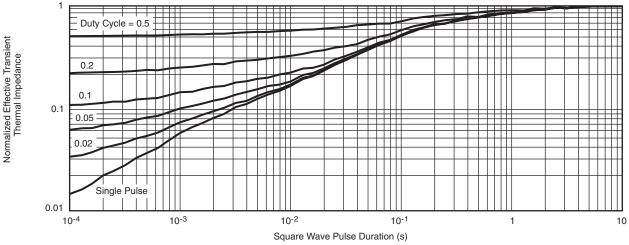
Power Derating, Junction-to-Ambient

^{*} 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.





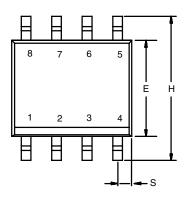
Normalized Thermal Transient Impedance, Junction-to-Ambient

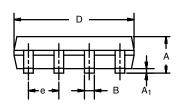


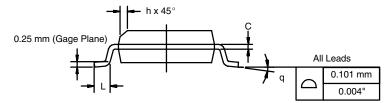
Normalized Thermal Transient Impedance, Junction-to-Foot



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







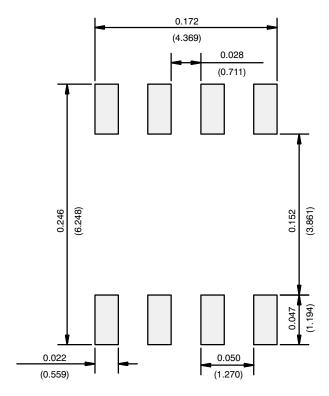
	MILLIM	IETERS	INCHES			
DIM	Min	Max	Min	Max		
Α	1.35	1.75	0.053	0.069		
A ₁	0.10	0.20	0.004	0.008		
В	0.35	0.51	0.014	0.020		
С	0.19	0.25	0.0075	0.010		
D	4.80	5.00	0.189	0.196		
E	3.80	4.00	0.150	0.157		
е	1.27	BSC	0.050	BSC		
Н	5.80	6.20	0.228	0.244		
h	0.25	0.50	0.010	0.020		
L	0.50	0.93	0.020	0.037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

DWG: 5498

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RECOMMENDED MINIMUM PADS FOR SO-8



Recommended Minimum Pads Dimensions in Inches/(mm)



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