

N-Channel 30 V (D-S) MOSFET

PRODUCT SUMMARY					
V _{DS} (V)	$R_{DS(on)}$ (Ω) Typ.	I _D (A)	Q _g (Typ.)		
30	0.004 at $V_{GS} = 4.5 \text{ V}$	60	33.5 nC		
30	0.005 at V _{GS} = 2.5 V	50	33.3110		

FEATURES

Halogen-free According to IEC 61249-2-21 Definition

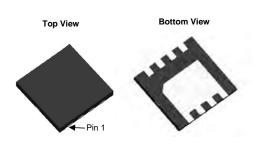


- 100 % R_g and UIS Tested Compliant to RoHS Directive 2002/95/EC

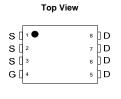


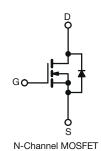
APPLICATIONS

- Motor Control
- Industrial
- Load Switch
- ORing



DFN 3x3 EP





ABSOLUTE MAXIMUM RATINGS (T _A = 25 °C, unless otherwise noted)					
Parameter		Symbol	Limit	Unit	
Drain-Source Voltage		V_{DS}	30	V	
Gate-Source Voltage		V_{GS}	± 20		
Continuous Drain Current (T _J = 150 °C)	$T_{C} = 25 ^{\circ}\text{C}$ $T_{C} = 70 ^{\circ}\text{C}$ $T_{A} = 25 ^{\circ}\text{C}$ $T_{A} = 70 ^{\circ}\text{C}$	I _D	60 ^{a, e} 40 ^{a, e} 22 ^{b, c} 15 ^{b, c}		
Pulsed Drain Current (t = 300 μs)		I _{DM}	150	A	
Continuous Source-Drain Diode Current	T _C = 25 °C T _A = 25 °C	- I _S	35 3.3 ^{b, c}		
Single Pulse Avalanche Current	L = 0.1 mH	I _{AS}	20		
Single Pulse Avalanche Energy	L = 0.1 IIII	E _{AS}	20	mJ	
Maximum Power Dissipation $ T_{C} = 25^{\circ} $ $ T_{C} = 70^{\circ} $ $ T_{A} = 25^{\circ} $ $ T_{\Delta} = 70^{\circ} $		P _D	52 33 3.7 ^{b, c} 2.4 ^{b, c}	w	
Operating Junction and Storage Temperature Range		T _J , T _{stg}	- 55 to 150	°C	
Soldering Recommendations (Peak Temperature)			260		

THERMAL RESISTANCE RATINGS						
Parameter		Symbol	Typical	Maximum	Unit	
Maximum Junction-to-Ambient ^{b, d}	t ≤ 10 s	R _{thJA}	24	33	°C/W	
Maximum Junction-to-Case (Drain)	Steady State	R _{thJC}	1.9	2.4		

- 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 90 °C/W.
- e. Calculated based on maximum junction temperature. Package limitation current is 80 A.



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	$\Delta V_{DS}/T_{J}$	J 050A		30		1406	
V _{GS(th)} Temperature Coefficient	$\Delta V_{GS(th)}/T_J$	$I_{D} = 250 \mu A$		- 5.6		mV/°C	
Gate-Source Threshold Voltage	V _{GS(th)}	$V_{DS} = V_{GS}$, $I_D = 250 \mu A$	0.5		1.5	V	
Gate-Source Leakage	I _{GSS}	$V_{DS} = 0 \text{ V}, V_{GS} = \pm 20 \text{ V}$			± 100	nA	
Zana Oata Wallana Busin Ouwant	,	$V_{DS} = 30 \text{ V}, V_{GS} = 0 \text{ V}$	5 °C		1	μА	
Zero Gate Voltage Drain Current	IDSS	$V_{DS} = 30 \text{ V}, V_{GS} = 0 \text{ V}, T_{J} = 55 \text{ °C}$			10		
On-State Drain Current ^a	I _{D(on)}	$V_{DS} \ge 5 \text{ V}, V_{GS} = 10 \text{ V}$	30			Α	
D : 0	Б	$V_{GS} = 4.5 \text{ V}, I_D = 10 \text{ A}$		0.0040	0040		
Drain-Source On-State Resistance ^a	R _{DS(on)}	$V_{GS} = 2.5 \text{ V}, I_D = 7 \text{ A}$		0.0050		Ω	
Forward Transconductance ^a	9 _{fs}	$V_{DS} = 15 \text{ V}, I_D = 10 \text{ A}$		65		S	
Dynamic ^b	<u> </u>						
Input Capacitance	C _{iss}			6000		pF	
Output Capacitance	C _{oss}	$V_{DS} = 15 \text{ V}, V_{GS} = 0 \text{ V}, f = 1 \text{ MHz}$		406			
Reverse Transfer Capacitance	C _{rss}			360			
Total Oaks Observe	Q _g	$V_{DS} = 15 \text{ V}, V_{GS} = 10 \text{ V}, I_{D} = 10 \text{ A}$		68	102	nC	
Total Gate Charge				33.5	51		
Gate-Source Charge	Q _{gs}	$V_{DS} = 15 \text{ V}, V_{GS} = 4.5 \text{ V}, I_D = 10 \text{ A}$		7.7			
Gate-Drain Charge	Q_{gd}			13.8			
Gate Resistance	R_{g}	f = 1 MHz	0.3	0.7	1.4	Ω	
Turn-On Delay Time	t _{d(on)}			24	45		
Rise Time	t _r	V_{DD} = 15 V, R_L = 1.5 Ω		24	45	1	
Turn-Off Delay Time	t _{d(off)}	$I_D\cong$ 10 A, V_{GEN} = 4.5 V, R_g = 1 Ω		32	60		
Fall Time	t _f			12	24		
Turn-On Delay Time	t _{d(on)}			14	28	ns	
Rise Time	t _r	V_{DD} = 15 V, R_L = 1.5 Ω		13	26		
Turn-Off Delay Time	t _{d(off)}	$I_D\cong 10$ A, V_{GEN} = 10 V, R_g = 1 Ω		33	60		
Fall Time	t _f			8	16		
Drain-Source Body Diode Characteristi	cs						
Continuous Source-Drain Diode Current	I _S	T _C = 25 °C		35			
Pulse Diode Forward Current	I _{SM}			70		A	
Body Diode Voltage	V _{SD}	I _S = 3 A, V _{GS} = 0 V		0.7	1.1	٧	
Body Diode Reverse Recovery Time	t _{rr}			21	40	ns	
Body Diode Reverse Recovery Charge	Q _{rr}	1 10 A dl/dt 100 A/v- T 05 00		10	20	nC	
Reverse Recovery Fall Time	ta	$I_F = 10 \text{ A}, \text{ dI/dt} = 100 \text{ A/}\mu\text{s}, T_J = 25 ^{\circ}\text{C}$		9			
Reverse Recovery Rise Time	t _b			12		ns	

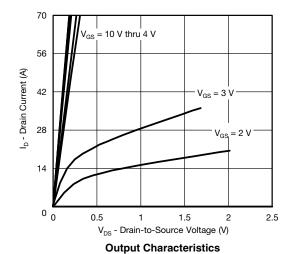
Notes:

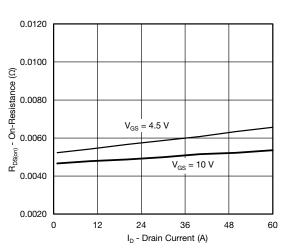
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Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational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

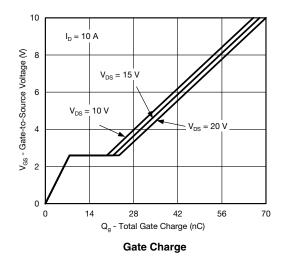
a. Pulse test; pulse width \leq 300 $\mu s,$ duty cycle \leq 2 % b. Guaranteed by design, not subject to production testing.

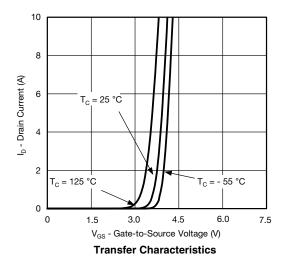


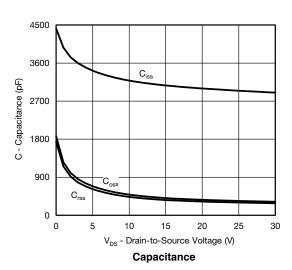


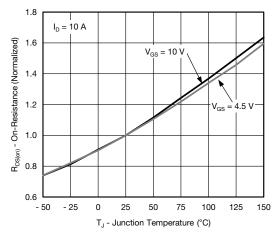


On-Resistance vs. Drain Current and Gate Voltage



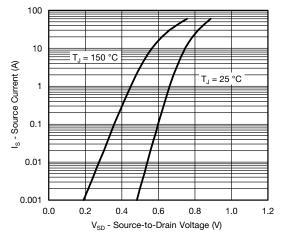




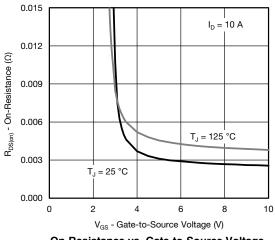


On-Resistance vs. Junction Temperature

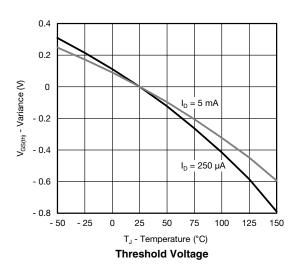


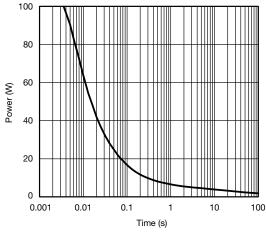


Source-Drain Diode Forward Voltage

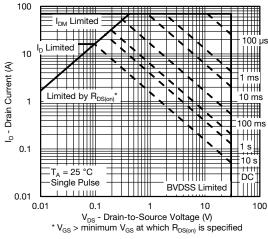


On-Resistance vs. Gate-to-Source Voltage



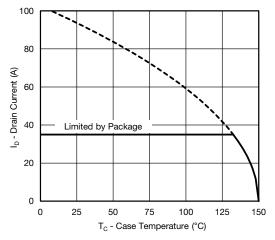


Single Pulse Power, Junction-to-Ambient

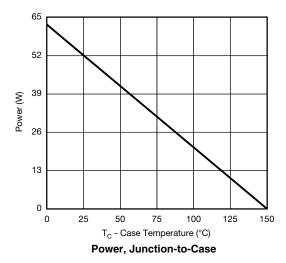


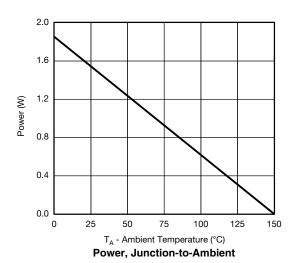
Safe Operating Area, Junction-to-Ambient





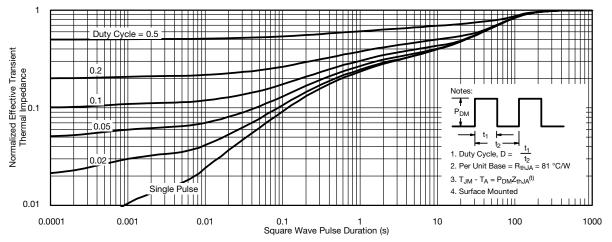
Current Derating*



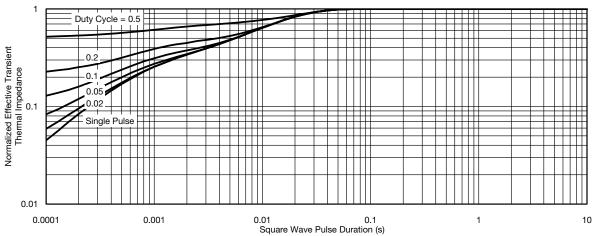


^{*} The power dissipation P_D is based on $T_{J(max.)} = 150$ °C, using junction-to-case thermal resistance, and is more useful in settling the upper dissipation limit for cases where additional heatsinking is used. It is used to determine the current rating, when this rating falls below the package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



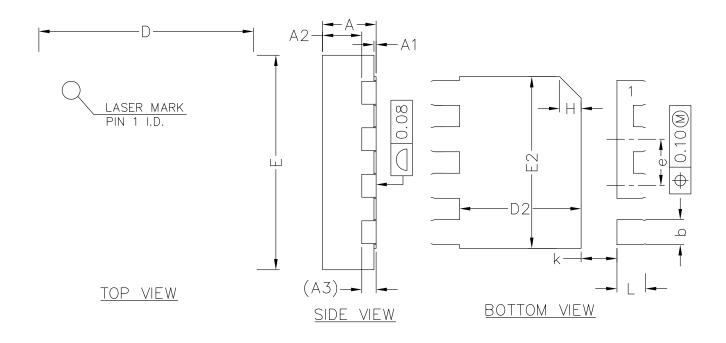


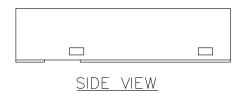
Normalized Thermal Transient Impedance, Junction-to-Ambient



Normalized Thermal Transient Impedance, Junction-to-Case







COMMON DIMENSIONS
(UNITS OF MEASURE=MILLIMETER)

SYMBOL	MIN	NOM	MAX	
Α	0.70	0.75	0.80	
A1	0.00	0.02	0.05	
A2	0.50	0.55	0.60	
А3	0.20REF			
Ь	0.30	0.35	0.40	
D	2.90	3.00	3.10	
E	2.90	3.00	3.10	
D2	1.60	1.70	1.80	
E2	2.30	2.40	2.50	
е	0.55	0.65	0.75	
K	0.40	0.50	0.60	
L	0.35	0.40	0.45	



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