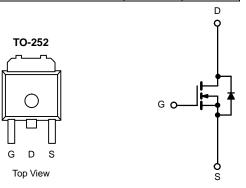


MDD2605RH-VB Datasheet N-Channel 30-V (D-S) MOSFET

PRODUCT SUMMARY						
V _{DS} (V)	$R_{DS(on)}(\Omega)$	I _D (A) ^{a, e}	Q _g (Typ)			
30	0.005 at V _{GS} = 10 V	80	31 nC			
30	0.006 at $V_{GS} = 4.5 \text{ V}$	68	31110			



FEATURES

- Trench Power MOSFET
- 100 % R_q and UIS Tested
- Compliant to RoHS Directive 2011/65/EU



APPLICATIONS

- OR-ing
- Server
- DC/DC

N-Channel MOSFET

Parameter		Symbol	Limit	Unit	
Drain-Source Voltage	V _{DS}	30	V		
Gate-Source Voltage		V _{GS}		± 20	
	T _C = 25 °C		80		
Continuous Drain Current (T _{.1} = 175 °C)	T _C = 70 °C		60		
Continuous Dialii Curient (1) = 175 C)	T _A = 25 °C	I _D	25.8 ^{b, c}	Α	
	T _A = 70 °C		22 ^{b, c}	^	
Pulsed Drain Current		I _{DM}	250		
Avalanche Current Pulse	L = 0.1 mH	I _{AS}	39		
Single Pulse Avalanche Energy	L = 0.1 IIII	E _{AS}	94.8	mJ	
Continuous Source-Drain Diode Current	T _C = 25 °C	I.	90 ^{a, e}	Λ	
Continuous Source-Drain Diode Current	T _A = 25 °C	I _S	3.13 ^{b, c}	A	
	T _C = 25 °C		205 ^a		
Maximum Dayer Dissipation	T _C = 70 °C	P _D	135	14/	
Maximum Power Dissipation	T _A = 25 °C	' D	3.75 ^{b, c}	W	
	T _A = 70 °C		2.63 ^{b, c}		
Operating Junction and Storage Temperature Range		T _J , T _{stg}	- 55 to 175	°C	

THERMAL RESISTANCE RATINGS						
Parameter		Symbol	Тур.	Max.	Unit	
Maximum Junction-to-Ambient ^{b, d}	t ≤ 10 sec	R _{thJA}	32	40	°C/W	
Maximum Junction-to-Case	Steady State	R _{thJC}	0.5	0.6	C/ VV	

Notes:

- a. Based on T_C = 25 °C.
 b. Surface mounted on 1" x 1" FR4 board.

- b. Striate informed on 1 X 1 114 board.
 c. t = 10 sec.
 d. Maximum under steady state conditions is 90 °C/W.
 e. Calculated based on maximum junction temperature. Package limitation current is 90 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	$\Delta V_{DS}/T_{J}$	L = 250 uA		35		ms\//9/	
V _{GS(th)} Temperature Coefficient	$\Delta V_{GS(th)}/T_J$	$I_D = 250 \mu A$ $V_{DS} = V_{GS}, I_D = 250 \mu A$		- 7.5		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	
Zara Oata Wallana Baria Oarrad		$V_{DS} = 30 \text{ V}, V_{GS} = 0 \text{ V}$			1		
Zero Gate Voltage Drain Current	I _{DSS}	$V_{DS} = 30 \text{ V}, V_{GS} = 0 \text{ V}, T_{J} = 55 \text{ °C}$			10	μA	
On-State Drain Current ^a	I _{D(on)}	$V_{DS} \ge 5 \text{ V}, V_{GS} = 10 \text{ V}$	90			Α	
	D	V _{GS} = 10 V, I _D = 38.8 A		0.005			
Drain-Source On-State Resistance ^a	R _{DS(on)}	$V_{GS} = 4.5 \text{ V}, I_D = 37 \text{ A}$		0.006		Ω	
Forward Transconductance ^a	9 _{fs}	V _{DS} = 15 V, I _D = 38.8 A		160		S	
Dynamic ^b							
Input Capacitance	C _{iss}			2201		pF	
Output Capacitance	C _{oss}	$V_{DS} = 15 \text{ V}, V_{GS} = 0 \text{ V}, f = 1 \text{ MHz}$		525			
Reverse Transfer Capacitance	C _{rss}			270			
Total Cata Charma	Qg	$V_{DS} = 15 \text{ V}, V_{GS} = 10 \text{ V}, I_D = 38.8 \text{ A}$		61	107	nC	
Total Gate Charge				31.5	50		
Gate-Source Charge	Q _{gs}	$V_{DS} = 15 \text{ V}, V_{GS} = 4.5 \text{ V}, I_{D} = 28.8 \text{ A}$		10			
Gate-Drain Charge	Q _{gd}			6			
Gate Resistance	R _g	f = 1 MHz		1.4	2.1	Ω	
Turn-On Delay Time	t _{d(on)}			18	27		
Rise Time	t _r	V_{DD} = 15 V, R_L = 0.625 Ω		11	17		
Turn-Off Delay Time	t _{d(off)}	$I_D\cong 24$ A, V_{GEN} = 10 V, R_g = 1 Ω		70	105		
Fall Time	t _f			10	15		
Turn-On Delay Time	t _{d(on)}			55	83	ns -	
Rise Time	t _r	V_{DD} = 15 V, R_L = 0.67 Ω		180	270		
Turn-Off Delay Time	t _{d(off)}	$I_D\cong 22.5$ A, V_{GEN} = 4.5 V, R_g = 1 Ω		55	83		
Fall Time	t _f			12	18		
Drain-Source Body Diode Characteristic	es						
Continuous Source-Drain Diode Current	I _S	T _C = 25 °C			120	Λ	
Pulse Diode Forward Current ^a	I _{SM}				120	Α	
Body Diode Voltage	V_{SD}	I _S = 22 A		0.8	1.2	V	
Body Diode Reverse Recovery Time	t _{rr}			52	78	ns	
Body Diode Reverse Recovery Charge	Q _{rr}	1 00 A di/d+ 100 A/:- T 05 00		70.2	105	nC	
Reverse Recovery Fall Time	t _a	$I_F = 20 \text{ A}, \text{ di/dt} = 100 \text{ A/}\mu\text{s}, T_J = 25 \text{ °C}$		27			
Reverse Recovery Rise Time		t _b		25		ns	

Notes:

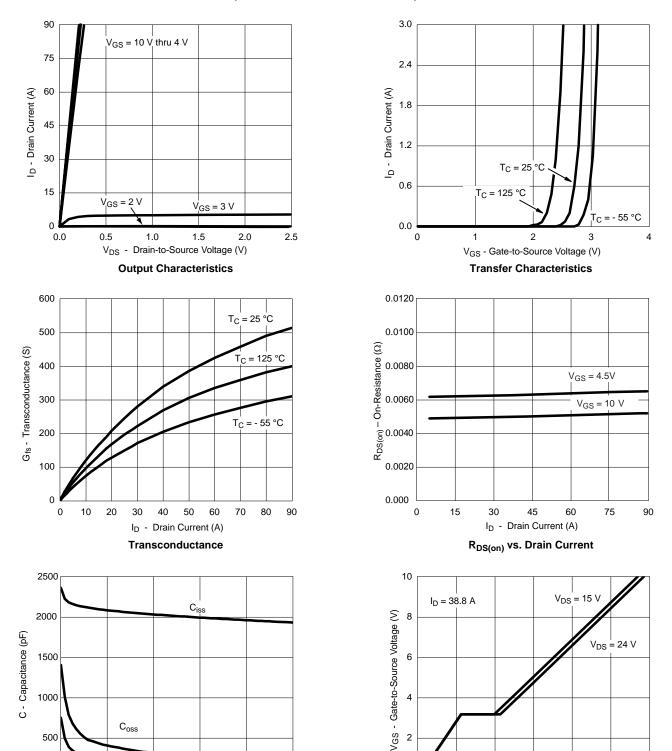
- a. Pulse test; pulse width $\leq 300~\mu s,$ duty cycle $\leq 2~\%.$
- b. Guaranteed by design, not subject to production testing.

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.

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TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



2

30

60

90

Q_g - Total Gate Charge (nC)

Gate Charge

120

150

180

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 C_{rss}

500

0

 $\mathsf{C}_{\mathsf{oss}}$

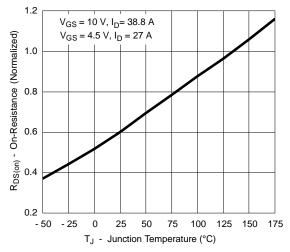
18

V_{DS} - Drain-to-Source Voltage (V) Capacitance

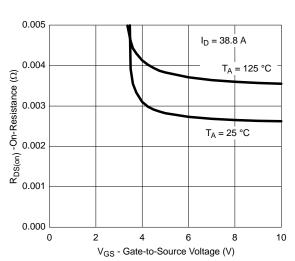
30



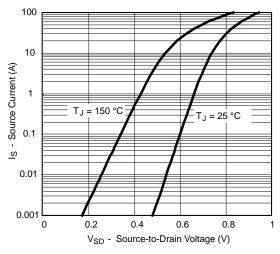
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



On-Resistance vs. Junction Temperature



 $R_{DS(on)}$ vs. V_{GS} vs. Temperature



Forward Diode Voltage vs. Temperature



Threshold Voltage

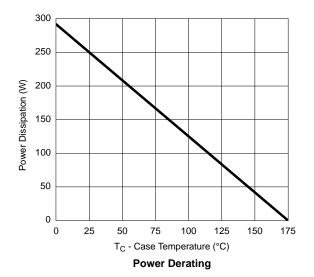


Safe Operating Area, Junction-to-Ambient



TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)





*The power dissipation P_D is based on $T_{J(max)}$ = 175 °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.

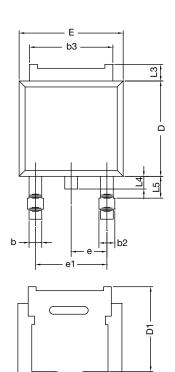


Normalized Thermal Transient Impedance, Junction-to-Case

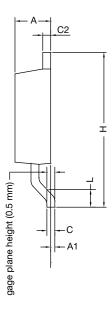
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TO-252AA CASE OUTLINE



E1



	MILLIMETERS		INC	HES		
DIM.	MIN.	MAX.	MIN.	MAX.		
А	2.18	2.38	0.086	0.094		
A1	-	0.127	-	0.005		
b	0.64	0.88	0.025	0.035		
b2	0.76	1.14	0.030	0.045		
b3	4.95	5.46	0.195	0.215		
С	0.46	0.61	0.018	0.024		
C2	0.46	0.89	0.018	0.035		
D	5.97	6.22	0.235	0.245		
D1	5.21	-	0.205	-		
Е	6.35	6.73	0.250	0.265		
E1	4.32	-	0.170	-		
Н	9.40	10.41	0.370	0.410		
е	2.28	BSC	0.090 BSC			
e1	4.56	BSC	0.180 BSC			
L	1.40	1.78	0.055	0.070		
L3	0.89	1.27	0.035	0.050		
L4	-	1.02	-	0.040		
L5	1.14	1.52	0.045	0.060		
ECN: X12-0247-Rev. M. 24-Dec-12						

DWG: 5347

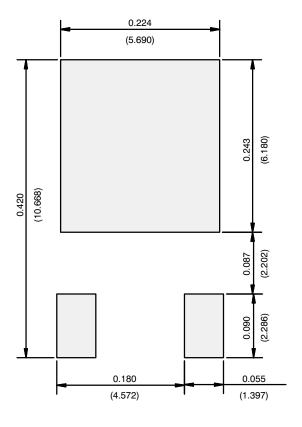
Note

• Dimension L3 is for reference only.

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RECOMMENDED MINIMUM PADS FOR DPAK (TO-252)



Recommended Minimum Pads Dimensions in Inches/(mm)

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