

40U03GH-VB Datasheet

N-Channel 30-V (D-S) MOSFET

PRODUCT SUMMARY						
V _{DS} (V)	$R_{DS(on)}$ (Ω)	I _D (A) ^{a, e}	Q _g (Typ)			
30	0.007 at V _{GS} = 10 V	70	25 nC			
	$0.009 \text{ at V}_{GS} = 4.5 \text{ V}$	60	23110			

TO-252

N-Channel MOSFET

FEATURES

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



APPLICATIONS

- OR-ing
- Server
- DC/DC

Parameter		Symbol	Limit	Unit	
Drain-Source Voltage	V _{DS}	30			
Gate-Source Voltage	V _{GS}	± 20	V		
	T _C = 25 °C		70		
Continuous Drain Current (T. = 175 °C)	T _C = 70 °C	1 ,	50		
Continuous Drain Current (T _J = 175 °C)	T _A = 25 °C	I _D	21.8 ^{b, c}	А	
	T _A = 70 °C		18 ^{b, c}	Α	
Pulsed Drain Current	I _{DM}	200			
Avalanche Current Pulse L = 0.1 ml		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-	50 ^{a, e}	А	
Continuous Source-Diam Diode Current	T _A = 25 °C	I _S	3.13 ^{b, c}	A	
	T _C = 25 °C		100 ^a		
Manianum Danian Dinain ation	T _C = 70 °C	P _D	75	10/	
Maximum Power Dissipation	T _A = 25 °C	r _D	3.25 ^{b, c}	W	
	T _A = 70 °C		2.33 ^{b, c}		
Operating Junction and Storage Temperature Ra	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	1	

Notes:

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

Top View

- b. Surface motived of 1. X.1.1144 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.



SPECIFICATIONS (T _J = 25 °C, unless otherwise noted)							
Parameter	Symbol	Test Conditions	Min.	Тур.	Max.	Unit	
Static	1				Τ	_	
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		35		mV/°C	
V _{GS(th)} Temperature Coefficient	$\Delta V_{GS(th)}/T_{J}$			- 7.5		111 7	
Gate-Source Threshold Voltage	V _{GS(th)}	$V_{DS} = V_{GS}, I_D = 250 \mu A$	1.5		2.0	V	
Gate-Source Leakage	I _{GSS}	$V_{DS} = 0 \text{ V}, V_{GS} = \pm 20 \text{ V}$			± 100	nA	
Zero Gate Voltage Drain Current	Inco	V _{DS} = 30 V, V _{GS} = 0 V			1		
Zero Gate Voltage Drain Guirent	IDSS	$V_{DS} = 30 \text{ V}, V_{GS} = 0 \text{ V}, T_{J} = 55 ^{\circ}\text{C}$			10	μA	
On-State Drain Current ^a	I _{D(on)}	$V_{DS} \ge 5 \text{ V}, V_{GS} = 10 \text{ V}$	90			Α	
David Course On Otata Basista and	D	$V_{GS} = 10 \text{ V}, I_D = 21.8 \text{ A}$		0.007		Ω	
Drain-Source On-State Resistance ^a	R _{DS(on)}	$V_{GS} = 4.5 \text{ V}, I_D = 18A$		0.009			
Forward Transconductance ^a	g _{fs}	V _{DS} = 15 V, I _D = 21.8 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}			370			
Total Cata Channa	0	V _{DS} = 15 V, V _{GS} = 10 V, I _D = 21.8 A		35	45	nC	
Total Gate Charge	Qg			25	35		
Gate-Source Charge	Q _{gs}	$V_{DS} = 15 \text{ V}, V_{GS} = 4.5 \text{ V}, I_D = 21.8 \text{ A}$		15			
Gate-Drain Charge	Q_{gd}			20			
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	$V_{DD} = 15 \text{ V}, R_{L} = 0.625 \Omega$		11	17	ns	
Turn-Off Delay Time	t _{d(off)}	$I_D \cong 24 \text{ A}, V_{GEN} = 10 \text{ V}, R_g = 1 \Omega$		70	105		
Fall Time	t _f			10	15		
Turn-On Delay Time	t _{d(on)}			55	83		
Rise Time	t _r	$V_{DD} = 15 \text{ V}, R_{L} = 0.67 \Omega$		180	270		
Turn-Off Delay Time	t _{d(off)}	$I_D \cong 22.5 \text{ A}, V_{GEN} = 4.5 \text{ V}, R_g = 1 \Omega$		55	83		
Fall Time	t _f	•		12	18		
Drain-Source Body Diode Characteristic	:S						
Continuous Source-Drain Diode Current	Is	T _C = 25 °C			120		
Pulse Diode Forward Current ^a	I _{SM}				120	A	
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}			70.2	105	nC	
Reverse Recovery Fall Time	t _a	$I_F = 20 \text{ A, di/dt} = 100 \text{ A/}\mu\text{s, T}_J = 25 °C$		27		1	
Reverse Recovery Rise Time	t _b			25		ns	

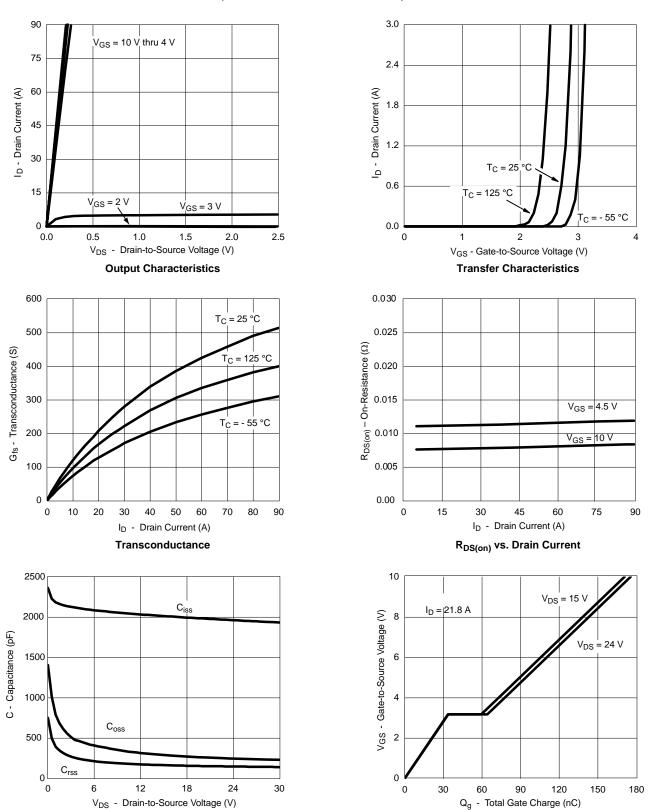
Notes:

- 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.



TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



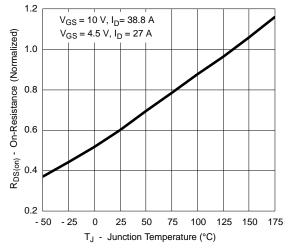
服务热线:400-655-8788

Capacitance

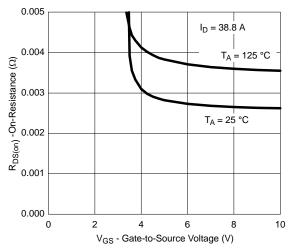
Gate Charge



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)





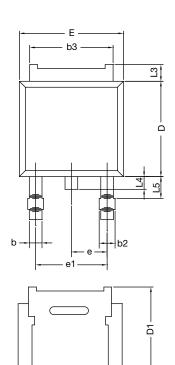
*The power dissipation P_D is based on $T_{J(max)}$ = 175 °C, using junction-to-case thermal resistance, and is more useful in settling the upper dissipation limit for cases where additional heatsinking is used. It is used to determine the current rating, when this rating falls below the package limit.

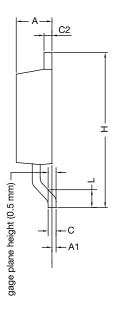


Normalized Thermal Transient Impedance, Junction-to-Case



TO-252AA CASE OUTLINE





	MILLIN	MILLIMETERS		HES				
DIM.	MIN.	MAX.	MIN.	MAX.				
Α	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 0.0 BSC 0.1		4.56 BSC 0.180 BSC		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-	ECN: X12-0247-Rev. M, 24-Dec-12							

ECN: X12-0247-Rev. M, 24-Dec-12 DWG: 5347

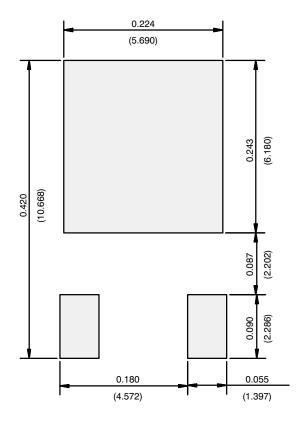
Note

• 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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