

NVMTS1D3P04M8L

Product Preview

Power MOSFET

-40 V, 1.15 mΩ, -361 A, Single P-Channel

Features

- Small Footprint (8x8 mm) for Compact Design
- Low $R_{DS(on)}$ to Minimize Conduction Losses
- Low Q_G and Capacitance to Minimize Driver Losses
- Power 88 Package, Industry Standard
- AEC-Q101 Qualified and PPAP Capable
- These Devices are Pb-Free, Halogen Free/BFR Free and are RoHS Compliant

MAXIMUM RATINGS ($T_J = 25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit		
Drain-to-Source Voltage	V_{DSS}	-40	V		
Gate-to-Source Voltage	V_{GS}	± 16	V		
Continuous Drain Current $R_{\theta JC}$ (Notes 1, 3)	Steady State	$T_C = 25^\circ\text{C}$	I_D	-361	A
		$T_C = 100^\circ\text{C}$		-255	
Power Dissipation $R_{\theta JC}$ (Note 1)	Steady State	$T_C = 25^\circ\text{C}$	P_D	300	W
		$T_C = 100^\circ\text{C}$		150	
Continuous Drain Current $R_{\theta JA}$ (Notes 1, 2, 3)	Steady State	$T_A = 25^\circ\text{C}$	I_D	-41	A
		$T_A = 100^\circ\text{C}$		-28	
Power Dissipation $R_{\theta JA}$ (Notes 1 & 2)	Steady State	$T_A = 25^\circ\text{C}$	P_D	3.9	W
		$T_A = 100^\circ\text{C}$		1.9	
Pulsed Drain Current	$T_A = 25^\circ\text{C}, t_p = 10 \mu\text{s}$	I_{DM}	TBD	A	
Operating Junction and Storage Temperature	T_J, T_{stg}	-55 to +175		$^\circ\text{C}$	
Source Current (Body Diode)	I_S	TBD		A	
Single Pulse Drain-to-Source Avalanche Energy ($I_{L(pk)} = \text{TBD A}$)	E_{AS}	TBD		mJ	
Lead Temperature for Soldering Purposes (1/8" from case for 10 s)	T_L	260		$^\circ\text{C}$	

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

THERMAL RESISTANCE MAXIMUM RATINGS

Parameter	Symbol	Value	Unit
Junction-to-Case - Steady State	$R_{\theta JC}$	0.5	$^\circ\text{C}/\text{W}$
Junction-to-Ambient - Steady State (Note 2)	$R_{\theta JA}$	38	

1. The entire application environment impacts the thermal resistance values shown, they are not constants and are only valid for the particular conditions noted.
2. Surface-mounted on FR4 board using a 650 mm², 2 oz. Cu pad.
3. Maximum current for pulses as long as 1 second is higher but is dependent on pulse duration and duty cycle.

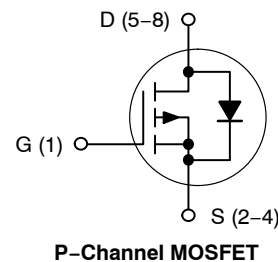
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$V_{(BR)DSS}$	$R_{DS(on)}$ MAX	I_D MAX
-40 V	1.15 mΩ @ -10 V	-361 A
	1.9 mΩ @ -4.5 V	



MARKING DIAGRAM

POWER 88
CASE TBD

TBD

1D3P04ML = Specific Device Code
A = Assembly Location
Y = Year
W = Work Week
ZZ = Lot Traceability

ORDERING INFORMATION

See detailed ordering, marking and shipping information in the package dimensions section on page 2 of this data sheet.

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ELECTRICAL CHARACTERISTICS ($T_J = 25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0\text{ V}, I_D = -250\ \mu\text{A}$	-40			V
Drain-to-Source Breakdown Voltage Temperature Coefficient	$V_{(BR)DSS}/T_J$			TBD		mV/°C
Zero Gate Voltage Drain Current	I_{DSS}	$V_{GS} = 0\text{ V}, V_{DS} = -40\text{ V}$	$T_J = 25\ ^\circ\text{C}$		-5.0	μA
			$T_J = 125^\circ\text{C}$		TBD	
Gate-to-Source Leakage Current	I_{GSS}	$V_{DS} = 0\text{ V}, V_{GS} = \pm 16\text{ V}$			± 100	nA

ON CHARACTERISTICS (Note 4)

Gate Threshold Voltage	$V_{GS(TH)}$	$V_{GS} = V_{DS}, I_D = -250\ \mu\text{A}$	-1.0		-3.0	V
Threshold Temperature Coefficient	$V_{GS(TH)}/T_J$			TBD		mV/°C
Drain-to-Source On Resistance	$R_{DS(on)}$	$V_{GS} = -10\text{ V}, I_D = -80\text{ A}$		0.90	1.15	m Ω
		$V_{GS} = -4.5\text{ V}, I_D = -50\text{ A}$		1.22	1.90	

CHARGES, CAPACITANCES & GATE RESISTANCE

Input Capacitance	C_{ISS}	$V_{GS} = 0\text{ V}, f = 1\text{ MHz}, V_{DS} = -20\text{ V}$		23500		pF
Output Capacitance	C_{OSS}			7660		
Reverse Transfer Capacitance	C_{RSS}			410		
Total Gate Charge	$Q_G(TOT)$	$V_{GS} = -4.5\text{ V}, V_{DS} = -20\text{ V}; I_D = -80\text{ A}$		TBD		nC
Total Gate Charge	$Q_G(TOT)$	$V_{GS} = -10\text{ V}, V_{DS} = -20\text{ V}; I_D = -80\text{ A}$		338		
Gate-to-Source Charge	Q_{GS}			64		
Gate-to-Drain Charge	Q_{GD}			41		

SWITCHING CHARACTERISTICS (Note 5)

Turn-On Delay Time	$t_{d(ON)}$	$V_{GS} = -10\text{ V}, V_{DS} = -20\text{ V}, I_D = -80\text{ A}, R_G = \text{TBD}\ \Omega$		TBD		ns
Rise Time	t_r			TBD		
Turn-Off Delay Time	$t_{d(OFF)}$			TBD		
Fall Time	t_f			TBD		

DRAIN-SOURCE DIODE CHARACTERISTICS

Forward Diode Voltage	V_{SD}	$V_{GS} = 0\text{ V}, I_S = -80\text{ A}$	$T_J = 25^\circ\text{C}$		-0.9	-1.25	V
Reverse Recovery Time	t_{RR}	$V_{GS} = 0\text{ V}, dI_S/dt = 100\text{ A}/\mu\text{s}, I_S = -80\text{ A}$		TBD		ns	
Charge Time	t_a			TBD			
Discharge Time	t_b			TBD			
Reverse Recovery Charge	Q_{RR}			TBD		nC	

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

- Pulse Test: pulse width $\leq 300\ \mu\text{s}$, duty cycle $\leq 2\%$.
- Switching characteristics are independent of operating junction temperatures.

DEVICE ORDERING INFORMATION


Device	Marking	Package	Shipping†
NVMTS1D3P04M8LTXG	1D3P04ML	POWER 88 (Pb-Free)	TBD / Tape & Reel

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

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PACKAGE DIMENSIONS

POWER 88
CASE TBD
ISSUE TBD

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