

NTQD6866

Product Preview

Power MOSFET 5.8 Amps, 20 Volts N-Channel TSSOP-8

Features

- New Low Profile TSSOP-8 Package
- Ultra Low $R_{DS(on)}$
- Higher Efficiency Extending Battery Life
- Logic Level Gate Drive
- Diode Exhibits High Speed, Soft Recovery
- Avalanche Energy Specified
- I_{DSS} and $V_{DS(on)}$ Specified at Elevated Temperatures

Applications

- Power Management in Portable and Battery-Powered Products, i.e.: Computers, Printers, PCMCIA Cards, Cellular and Cordless Telephones
- Lithium Ion Battery Applications
- Note Book PC

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

Rating	Symbol	Value	Unit
Drain-to-Source Voltage	V_{DS}	20	Vdc
Gate-to-Source Voltage – Continuous	V_{GS}	± 12	Vdc
Drain Current – Continuous	I_D	5.8	Adc
– Continuous @ 70°C	I_D	TBD	
– Single Pulse ($t_p \leq 10 \mu\text{s}$)	I_{DM}	20	
Total Power Dissipation	P_D	1.6	W
Operating and Storage Temperature Range	T_J, T_{stg}	-55 to $+150$	$^\circ\text{C}$
Single Pulse Drain-to-Source Avalanche Energy – Starting $T_J = 25^\circ\text{C}$ ($V_{DD} = 20 \text{ Vdc}$, $V_{GS} = 5 \text{ Vdc}$, $I_L = 10 \text{ Apk}$, $L = 10 \text{ mH}$, $R_G = 25 \Omega$)	E_{AS}	580	mJ
Thermal Resistance – Junction-to-Ambient (Note 1.)	$R_{\theta JA}$		$^\circ\text{C/W}$
Single Channel Steady State		180	
Both Channels		176	
Junction-to-Ambient (Note 2.)			
Both Channels		100	
Thermal Resistance – Junction-to-Lead	$R_{\theta JL}$		$^\circ\text{C/W}$
Single Channel		27	
Both Channels Steady State		24	

1. Surface Mounted to Min Pad.
2. Surface Mounted to 1" x 1" FR4 Board.

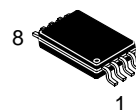
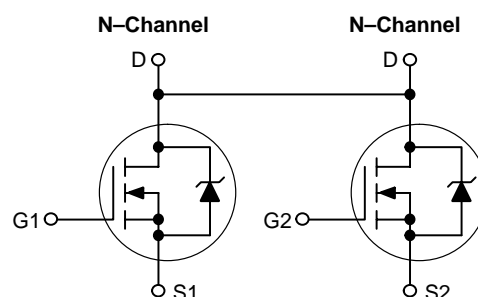


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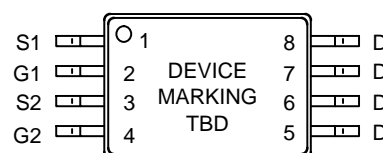
**5.8 AMPERES
20 VOLTS**

$R_{DS(on)} = 30 \text{ m}\Omega$



**TSSOP-8
CASE 948S
PLASTIC**

MARKING DIAGRAM & PIN ASSIGNMENT



Top View

ORDERING INFORMATION

Device	Package	Shipping
NTQD6866	TSSOP-8	100 Units/Rail
NTQD6866R2	TSSOP-8	3000/Tape & Reel

This document contains information on a product under development. ON Semiconductor reserves the right to change or discontinue this product without notice.

NTQD6866

ELECTRICAL CHARACTERISTICS (T_C = 25°C unless otherwise noted)

Characteristic	Symbol	Min	Typ	Max	Unit
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OFF CHARACTERISTICS

Drain-to-Source Breakdown Voltage (V _{GS} = 0 Vdc, I _D = 0.25 mAdc) Temperature Coefficient (Positive)	V _{(BR)DSS}	20 –	– TBD	– –	Vdc mV/°C
Zero Gate Voltage Collector Current (V _{DS} = 20 Vdc, V _{GS} = 0 Vdc) (V _{DS} = 20 Vdc, V _{GS} = 0 Vdc, T _J = 85°C)	I _{DSS}	– –	– –	1.0 25	μAdc
Gate-Body Leakage Current (V _{GS} = ±12 Vdc, V _{DS} = 0 Vdc)	I _{GSS(f)} I _{GSS(r)}	– –	– –	100 100	nAdc

ON CHARACTERISTICS (Note 3.)

Gate Threshold Voltage (V _{DS} = V _{GS} , I _D = 0.25 mA) Temperature Coefficient (Negative)	V _{GS(th)}	0.6 –	0.9 TBD	1.2 –	Vdc mV/°C
Static Drain-to-Source On-State Resistance (V _{GS} = 4.5 Vdc, I _D = 7.0 Adc) (V _{GS} = 4.0 Vdc, I _D = 7.0 Adc) (V _{GS} = 2.5 Vdc, I _D = 3.5 Adc)	R _{DS(on)}	– – –	TBD 0.026 0.031	TBD 0.030 0.040	Ω
Forward Transconductance (V _{DS} = 10 Vdc, I _D = 7.0 Adc)	g _{FS}	TBD	17	–	Mhos

DYNAMIC CHARACTERISTICS

Input Capacitance	(V _{DS} = 10 Vdc, V _{GS} = 0 Vdc, f = 1.0 MHz)	C _{iss}	–	930	TBD	pF
Output Capacitance		C _{oss}	–	370	TBD	
Transfer Capacitance		C _{rss}	–	105	TBD	

SWITCHING CHARACTERISTICS (Note 4.)

Turn-On Delay Time	(V _{DD} = 10 Vdc, I _D = 1.0 Adc, V _{GS} = 4.5 Vdc, R _L = 10, R _G = 6.0 Ω)	t _{d(on)}	–	8.6	TBD	ns
Rise Time		t _r	–	14	TBD	
Turn-Off Delay Time		t _{d(off)}	–	57	TBD	
Fall Time		t _f	–	54	TBD	
Gate Charge	(V _{DS} = 10 Vdc, V _{GS} = 4.5 Vdc, I _D = 5.8 Adc)	Q _T	–	11	15	nC
		Q ₁	–	2.4	–	
		Q ₂	–	2.4	–	

SOURCE-DrAIN DIODE CHARACTERISTICS

Forward On-Voltage (Note 3.)	(I _S = 1.8 Adc, V _{GS} = 0 Vdc) (I _S = 1.8 Adc, V _{GS} = 0 Vdc, T _J = 85°C)	V _{SD}	– –	0.7 TBD	1.0 –	Vdc
Reverse Recovery Time	(I _S = 1.5 Adc, V _{GS} = 0 Vdc, dI _S /dt = 100 A/μs)	t _{rr}	–	30	–	ns
		t _a	–	14.5	–	
		t _b	–	15.5	–	
Reverse Recovery Stored Charge		Q _{RR}	–	0.01	–	μC

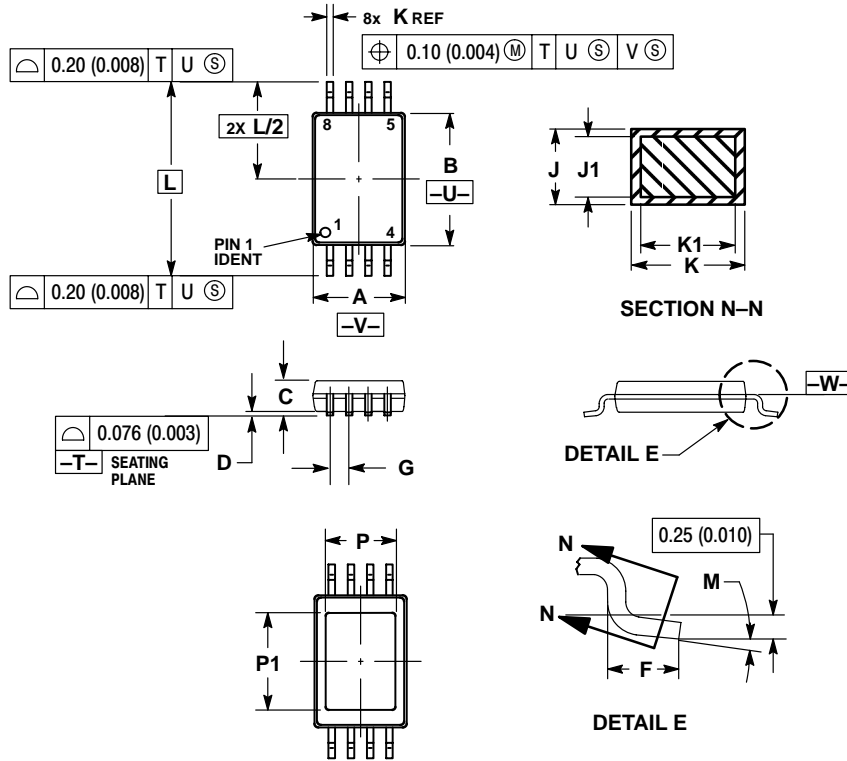
3. Pulse Test: Pulse Width = 300 μs, Duty Cycle = 2%.

4. Switching characteristics are independent of operating junction temperature.

NTQD6866

PACKAGE DIMENSIONS

TSSOP-8
CASE 948S-01
PLASTIC
ISSUE O



NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETER.
3. DIMENSION A DOES NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS. MOLD FLASH OR GATE BURRS SHALL NOT EXCEED 0.15 (0.006) PER SIDE.
4. DIMENSION B DOES NOT INCLUDE INTERLEAD FLASH OR PROTRUSION. INTERLEAD FLASH OR PROTRUSION SHALL NOT EXCEED 0.25 (0.010) PER SIDE.
5. TERMINAL NUMBERS ARE SHOWN FOR REFERENCE ONLY.
6. DIMENSION A AND B ARE TO BE DETERMINED AT DATUM PLANE -W-.

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	2.90	3.10	0.114	0.122
B	4.30	4.50	0.169	0.177
C	---	1.10	---	0.043
D	0.05	0.15	0.002	0.006
F	0.50	0.70	0.020	0.028
G	0.65 BSC	0.026 BSC		
J	0.09	0.20	0.004	0.008
J1	0.09	0.16	0.004	0.006
K	0.19	0.30	0.007	0.012
K1	0.19	0.25	0.007	0.010
L	6.40 BSC	0.252 BSC		
M	0°	8°	0°	8°
P	---	2.20	---	0.087
P1	---	3.20	---	0.126

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