

MOSFET – Power, N-Channel, SUPERFET® III

Product Preview NTP360N80S3Z 800 V, 360 mΩ, 13 A

Description

800 V SUPERFET III is ON Semiconductor's high performance MOSFET family offering 800 V breakdown voltage.

New 800 V SUPERFET III MOSFET which is optimized for primary switch of flyback converter, enables lower switching losses and case temperature without sacrificing EMI performance due to its optimized design.

This new family of 800 V SUPERFET III MOSFET enables to make more efficient, compact, cooler and more robust applications because of its remarkable performance in switching power applications such as Laptop adapter, Audio, Lighting, ATX power and industrial power supplies.

Features

- Typ. $R_{DS(on)} = 300\text{ m}\Omega$
- Ultra Low Gate Charge (Typ. $Q_g = 24.7\text{ nC}$)
- Low Stored Energy in Output Capacitance ($E_{oss} = 2.9\text{ }\mu\text{J @ 400 V}$)
- 100% Avalanche Tested
- ESD Improved Capability with Zener Diode
- RoHS Compliant

Applications

- Adapters / Chargers
- LED Lighting
- AUX Power
- Audio
- Industrial Power

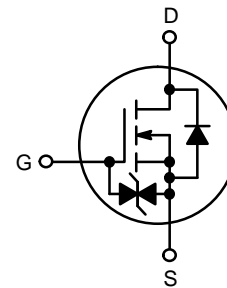
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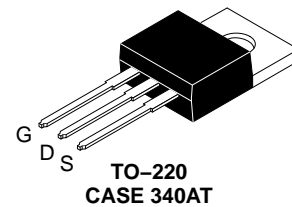
ON Semiconductor®

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$V_{(BR)DSS}$	$R_{DS(ON)}\text{ MAX}$	$I_D\text{ MAX}$
800 V	360 mΩ	13 A

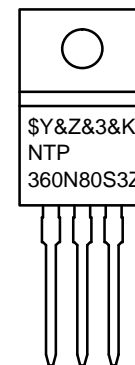


POWER MOSFET



TO-220
CASE 340AT

MARKING DIAGRAM



- \$Y = ON Semiconductor Logo
- &Z = Assembly Plant Code
- &3 = Data Code (Year & Week)
- &K = Lot
- NTP360N80S3Z = Specific Device Code

ORDERING INFORMATION

See detailed ordering and shipping information on page 2 of this data sheet.

NTP360N80S3Z

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

Symbol	Parameter	Value	Unit
V_{DSS}	Drain-to-Source Voltage	800	V
V_{GS}	Gate-to-Source Voltage	DC	± 20
		AC ($f > 1\text{ Hz}$)	± 30
I_D	Drain Current	Continuous ($T_C = 25^\circ\text{C}$)	13
		Continuous ($T_C = 100^\circ\text{C}$)	8.2
I_{DM}	Drain Current	Pulsed (Note 1)	32.5
E_{AS}	Single Pulsed Avalanche Energy (Note 2)	TBD	mJ
I_{AS}	Avalanche Current (Note 2)	TBD	A
E_{AR}	Repetitive Avalanche Energy (Note 1)	TBD	mJ
dv/dt	MOSFET dv/dt	100	V/ns
	Peak Diode Recovery dv/dt (Note 3)	20	
P_D	Power Dissipation	($T_C = 25^\circ\text{C}$)	152
		Derate Above 25°C	TBD
T_J, T_{STG}	Operating and Storage Temperature Range	-55 to $+150$	$^\circ\text{C}$
T_L	Lead Temperature Soldering Reflow for Soldering Purposes (1/8" from Case for 10 seconds)	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.

1. Repetitive rating: pulse-width limited by maximum junction temperature.
2. $I_{AS} = \text{TBD A}$, $R_G = 25\ \Omega$, starting $T_J = 25^\circ\text{C}$.
3. $I_{SD} \leq 6\text{ A}$, $di/dt \leq 200\text{ A}/\mu\text{s}$, $V_{DD} \leq 400\text{ V}$, starting $T_J = 25^\circ\text{C}$.

THERMAL RESISTANCE RATINGS

Symbol	Parameter	Value	Unit
$R_{\theta JC}$	Junction-to-Case – Steady State	TBD	$^\circ\text{C}/\text{W}$
$R_{\theta JA}$	Junction-to-Ambient – Steady State	TBD	

PACKAGE MARKING AND ORDERING INFORMATION

Part Number	Top Marking	Package	Packing Method	Reel Size	Tape Width	Quantity
NTP360N80S3Z	NTP360N80S3Z	TO-220	Tube	N/A	N/A	50 Units

NTP360N80S3Z

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

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
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OFF CHARACTERISTICS

BV _{DSS}	Drain-to-Source Breakdown Voltage	V _{GS} = 0 V, I _D = 1 mA, T _J = 25°C	800			V
		V _{GS} = 0 V, I _D = 1 mA, T _J = 150°C	900			V
ΔBV _{DSS} / ΔT _J	Breakdown Voltage Temperature Coefficient	I _D = 1 mA, Referenced to 25°C		0.96		V/°C
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = 800 V, V _{GS} = 0 V			10	μA
		V _{DS} = 640 V, T _C = 125°C		20		
I _{GSS}	Gate-to-Body Leakage Current	V _{GS} = ±20 V, V _{DS} = 0 V			10	μA

ON CHARACTERISTICS

V _{GS(th)}	Gate Threshold Voltage	V _{GS} = V _{DS} , I _D = 0.3 mA	2.2		3.8	V
R _{DS(on)}	Static Drain-to-Source On Resistance	V _{GS} = 10 V, I _D = 6.5 A		300	360	mΩ
g _{FS}	Forward Transconductance	V _{DS} = 20 V, I _D = 6.5 A		13		S

DYNAMIC CHARACTERISTICS

C _{iss}	Input Capacitance	V _{DS} = 400 V, V _{GS} = 0 V, f = 250 kHz		1120		pF
C _{oss}	Output Capacitance				16.4	
C _{oss(eff.)}	Effective Output Capacitance	V _{DS} = 0 V to 400 V, V _{GS} = 0 V		315		pF
C _{oss(er.)}	Energy Related Output Capacitance	V _{DS} = 0 V to 400 V, V _{GS} = 0 V		34		pF
Q _{g(tot)}	Total Gate Charge at 10 V	V _{DS} = 400 V, I _D = 6.5 A, V _{GS} = 10 V (Note 4)		24.7		nC
Q _{gs}	Gate-to-Source Gate Charge			6		nC
Q _{gd}	Gate-to-Drain "Miller" Charge			10.2		nC
ESR	Equivalent Series Resistance	f = 1 MHz		3.6		Ω

SWITCHING CHARACTERISTICS

t _{d(on)}	Turn-On Delay Time	V _{DD} = 400 V, I _D = 6.5 A, V _{GS} = 10 V, R _g = 25 Ω (Note 4)		20.3		ns
t _r	Turn-On Rise Time			2.8		ns
t _{d(off)}	Turn-Off Delay Time			37		ns
t _f	Turn-Off Fall Time			10.1		ns

SOURCE-DRAIN DIODE CHARACTERISTICS

I _S	Maximum Continuous Source-to-Drain Diode Forward Current			13		A
I _{SM}	Maximum Pulsed Source-to-Drain Diode Forward Current			32.5		A
V _{SD}	Source-to-Drain Diode Forward Voltage	V _{GS} = 0 V, I _{SD} = 6.5 A			1.2	V
t _{rr}	Reverse Recovery Time	V _{GS} = 0 V, I _{SD} = 6.5 A, dI _F /dt = 100 A/μs		370		ns
Q _{rr}	Reverse Recovery Charge				3.2	

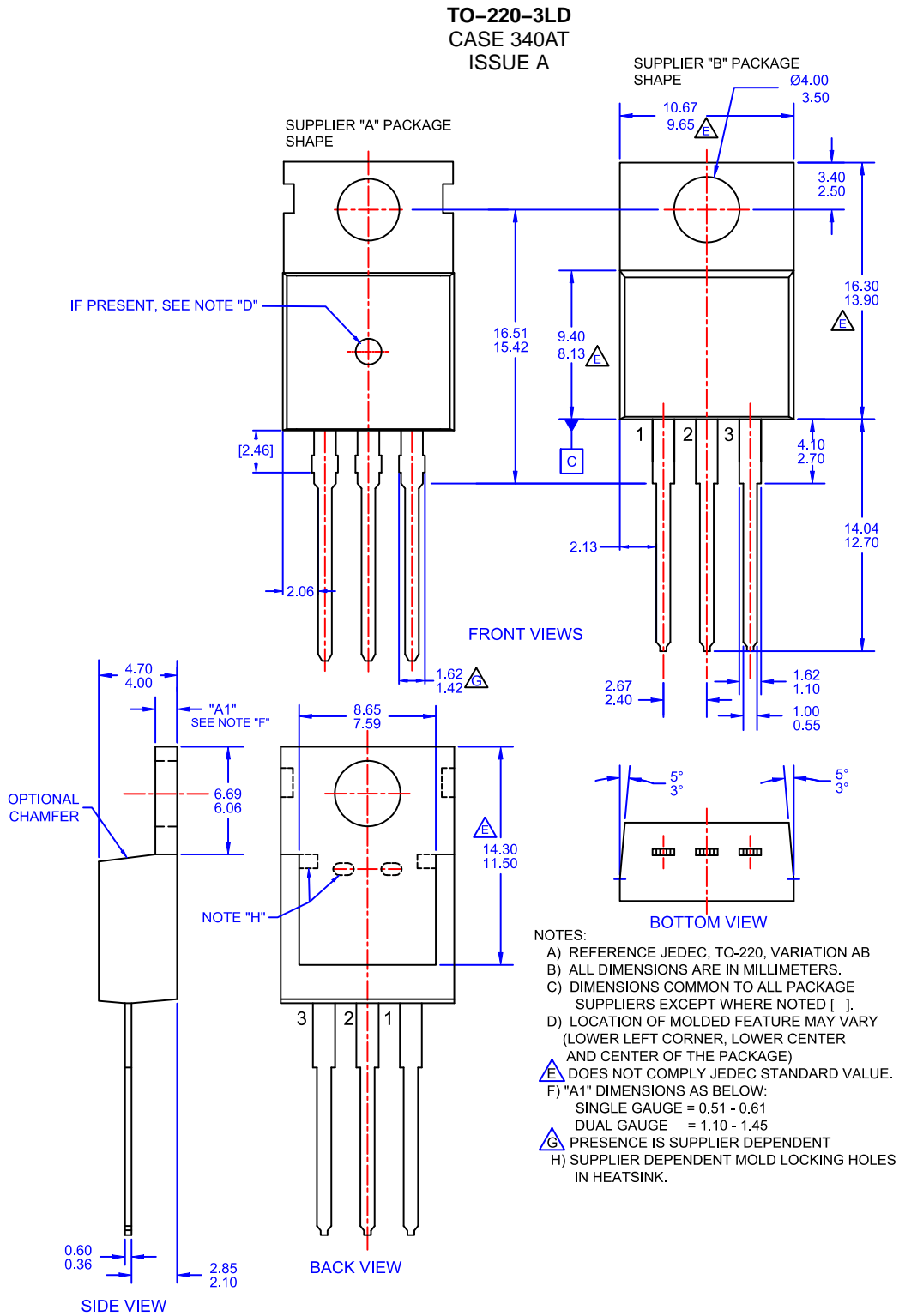
Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

4. Essentially independent of operating temperature typical characteristics.


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PACKAGE DIMENSIONS



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