

**S** **Ca** **(S C)**  
**MOSFET – E S C,**  
**32 , 650 V, M3S, TOLL**  
**NTBL032N065M3S**

$V_{(BR)DSS}$	$R_{DS(ON) TYP}$	$I_D MAX$
---------------	------------------	-----------

**Features**

- Typical  $R_{DS(on)} = 32\text{ m}\Omega$  @  $V_{GS} = 18\text{ V}$
- Ultra Low Gate Charge ( $Q_{G(tot)} = 55\text{ nC}$ )
- High Speed Switching with Low Capacitance ( $C_{oss} = 113\text{ pF}$ )
- 100% Avalanche Tested
- This Device is Halide Free and RoHS Compliant with Exemption 7a, Pb-Free 2LI (on second level interconnection)

**Applications**

- SMPS (Switching Mode Power Supplies)
- Solar Inverters
- UPS (Uninterruptable Power Supplies)
- Energy Storage
- EV Charging Infrastructure

**ORDERING INFORMATION**

See detailed ordering and shipping information on page 9 of this data sheet.

# NTBL032N065M3S

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

Parameter	Symbol	Value	Unit	
Drain-to-Source Voltage	$V_{DSS}$	650	V	
Gate-to-Source Voltage	$V_{GS}$	-8/+22	V	
Continuous Drain Current	$I_D$	55	A	
Power Dissipation				227
Continuous Drain Current	$I_D$	39	A	
Power Dissipation				113
Pulsed Drain Current (Note 1)	$I_{DM}$	192	A	
Continuous Source-Drain Current (Body Diode)	$I_S$	$T_C = 25^\circ\text{C}, V_{GS} = -3\text{ V}$	33	A
		$T_C = 100^\circ\text{C}, V_{GS} = -3\text{ V}$	19	
Pulsed Source-Drain Current (Body Diode) (Note 1)	$I_{SM}$	173	A	
Single Pulse Avalanche Energy ( $I_{LPK} = 16.7\text{ A}, L = 1\text{ mH}$ ) (Note 2)	$E_{AS}$	139	mJ	
Operating Junction and Storage Temperature Range	$T_J, T_{stg}$	-55 to +175	$^\circ\text{C}$	
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.

1. Repetitive rating, limited by max junction temperature.
2.  $E_{AS}$  of 139 mJ is based on starting  $T_J = 25^\circ\text{C}$ ,  $L = 1\text{ mH}$ ,  $I_{AS} = 16.7\text{ A}$ ,  $V_{DD} = 100\text{ V}$ ,  $V_{GS} = 18\text{ V}$ .

## THERMAL CHARACTERISTICS

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-Case (Note 3)	$R_{\theta JC}$	0.66	$^\circ\text{C/W}$
Thermal Resistance, Junction-to-Ambient (Note 3)	$R_{\theta JA}$	43	$^\circ\text{C/W}$

3. The entire application environment impacts the thermal resistance values shown, they are not constants and are only valid for the particular conditions noted.

## RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	Value	Unit
Operation Values of Gate-to-Source Voltage	$V_{GSop}$	-5...-3/+18	V

Functional operation above the stresses listed in the Recommended Operating Ranges is not implied. Extended exposure to stresses beyond the Recommended Operating Ranges limits may affect device reliability.

# NTBL032N065M3S

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
-----------	--------	-----------------	-----	-----	-----	------

### OFF CHARACTERISTICS

Drain-to-

NTBL032N065M3S

# NTBL032N065M3S

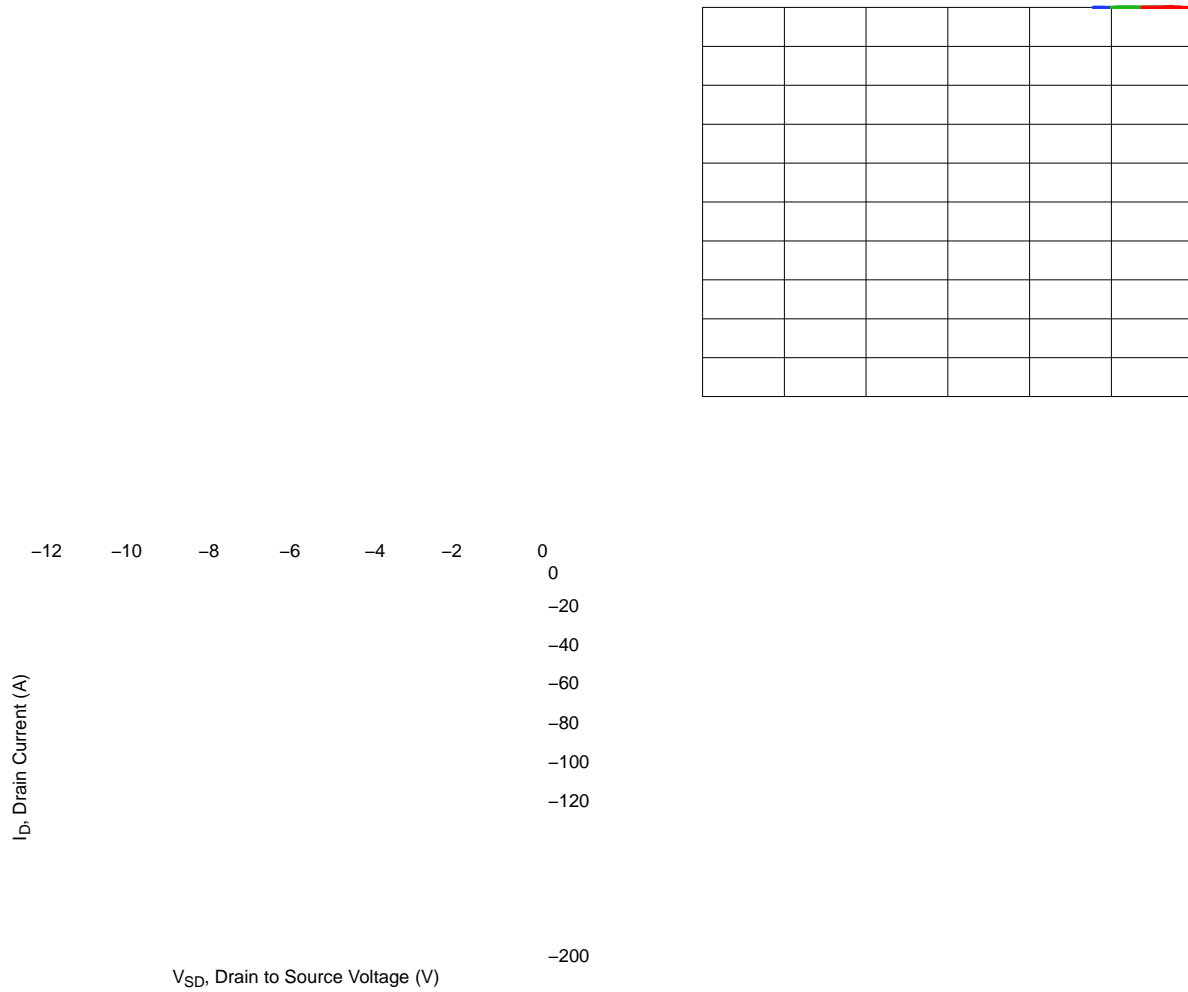
## TYPICAL CHARACTERISTICS

Figure 1. Output Characteristics

Figure 2. Output Characteristics

# NTBL032N065M3S

## TYPICAL CHARACTERISTICS





# NTBL032N065M3S

## TYPICAL CHARACTERISTICS

Figure 17. Inductive Switching Loss vs. Drain Voltage

Figure 18. Inductive Switching Loss vs. Gate Resistance

Figure 19. Inductive Switching Loss vs. Gate Resistance

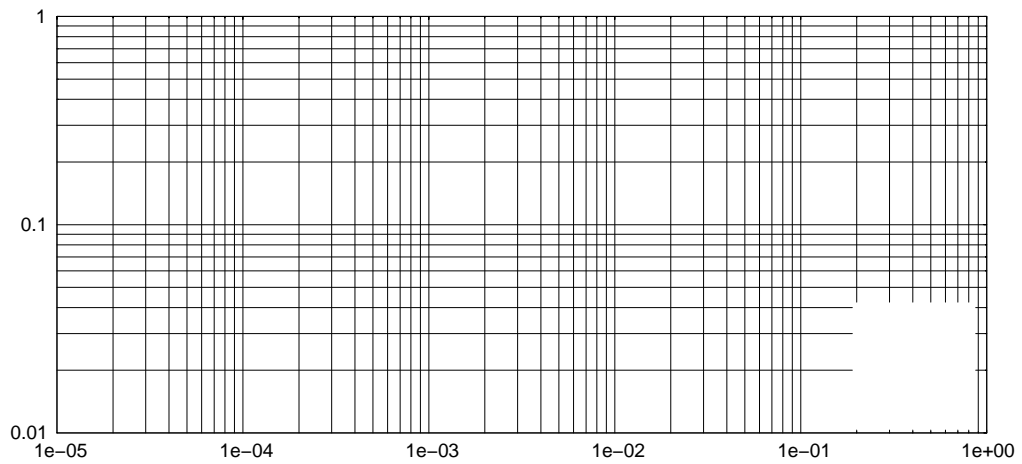


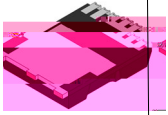
Figure 20. Thermal Response Characteristics



# NTBL032N065M3S

## DEVICE ORDERING INFORMATION

Device	Package	Shipping†
NTBL032N065M3S	H-PSOF8L	2000 / Tape & Reel



**H-PSOF8L 9.90x10.38x2.30, 1.20P**  
CASE 100DC  
ISSUE D

DATE 30 JUL 2024

—| D4 (2x) |—

LAND PATTERN  
RECOMMENDATION



- H/2

**GENERIC  
MARKING DIAGRAM\***

- XXXX = Specific Device Code
- A = Assembly Location
- Y = Year
- WW = Work Week
- ZZ = Assembly Lot Code



\*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G" or microdot "▪", may or may not be present. Some products may not follow the Generic Marking.

**onsemi**, **onsemi**, and other names, marks, and brands are registered and/or common law trademarks of Semiconductor Components Industries, LLC dba "**onsemi**" or its affiliates and/or subsidiaries in the United States and/or other countries. **onsemi** owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of **onsemi**'s product/patent coverage may be accessed at [www.onsemi.com/site/pdf/Patent-Marking.pdf](http://www.onsemi.com/site/pdf/Patent-Marking.pdf). **onsemi** reserves the right to make changes at any time to any products or information herein, without notice. The information herein is provided "as-is" and **onsemi** makes no warranty, representation or guarantee regarding the accuracy of the information, product features, availability, functionality, or suitability of its products for any particular purpose, nor does **onsemi** assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. Buyer is responsible for its products and applications using **onsemi**

---

---