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 mΩ @ V_{GS} = 18 V
- Ultra Low Gate Charge ($Q_{G(tot)}$ = 55 nC)
- High Speed Switching with Low Capacitance (Coss = 113 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.

MAXIMUM RATINGS (T_J = 25°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	T_C = 25°C	I_D	55	A
Power Dissipation		P_D	227	W
Continuous Drain Current	T_C = 100°C	I_D	39	A
Power Dissipation		P_D	113	W
Pulsed Drain Current (Note 1)	T_C = 25°C, t_p = 100 μs	I_{DM}	192	A
Continuous Source−Drain Current (Body Diode)	T_C = 25°C, V_{GS} = −3 V	I_S	33	A
	T_C = 100°C, V_{GS} = −3 V		19	
Pulsed Source−Drain Current (Body Diode) (Note 1)	T_C = 25°C, V_{GS} = −3 V, t_p = 100 μs	I_{SM}	173	A
Single Pulse Avalanche Energy (I_{LPK} = 16.7 A, L = 1 mH) (Note 2)		E_{AS}	139	mJ
Operating Junction and Storage Temperature Range		T_J, T_{stg}	−55 to +175	°C
Lead Temperature for Soldering Purposes (1/8″ from Case for 10 s)		T_L	260	°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°C, L = 1 mH, I_{AS} = 16.7 A, V_{DD} = 100 V, V_{GS} = 18 V.

THERMAL CHARACTERISTICS

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

ELECTRICAL CHARACTERISTICS (T_J = 25°C unless otherwise stated)

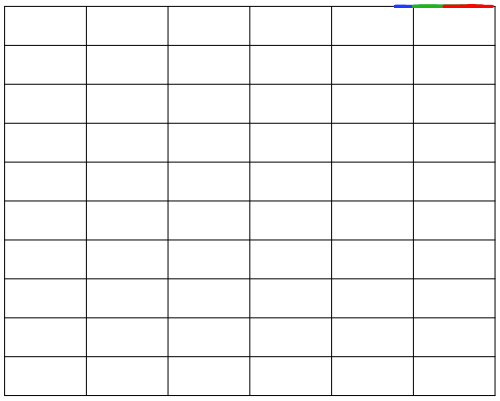
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF CHARACTERISTICS						
Drain−to−						

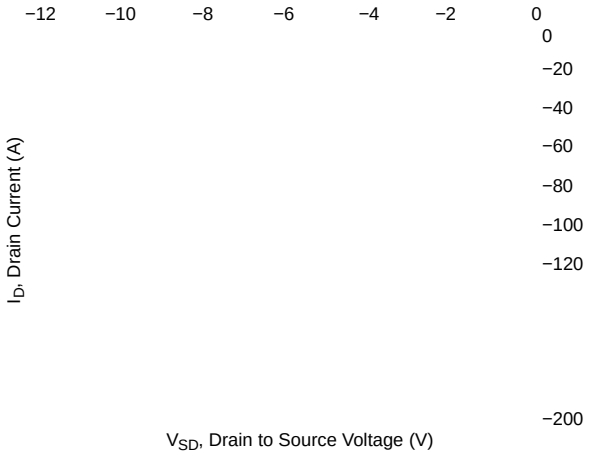
TYPICAL CHARACTERISTICS

Figure 1. Output Characteristics

Figure 2. Output Characteristics

TYPICAL CHARACTERISTICS





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

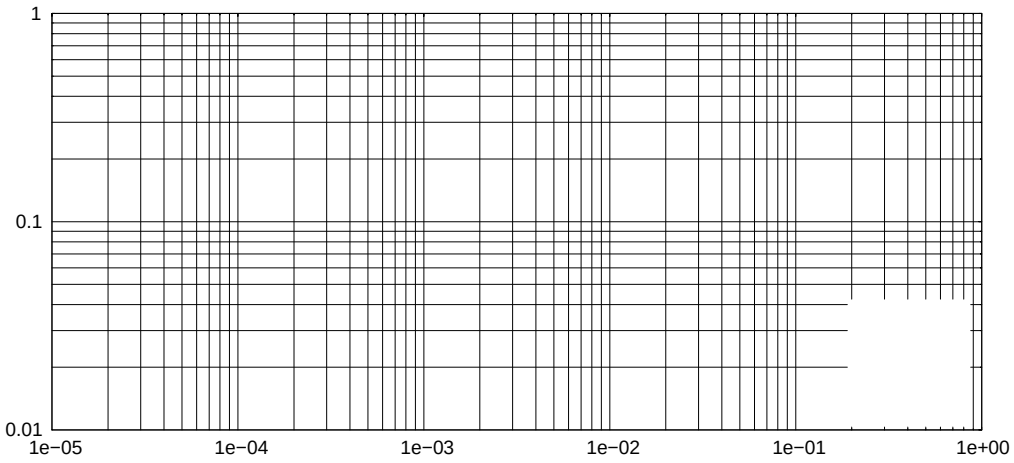
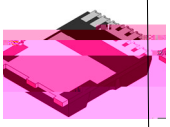


Figure 20. Thermal Response Characteristics

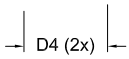
DEVICE ORDERING INFORMATION

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



LAND PATTERN
RECOMMENDATION

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.