

**S** **Ca b** **(S C)**  
**MOSFET – E S C,**  
**29 m $\Omega$  m, 1200 V, M3S,**  
**TO-247-4L**

## **NVH4L030N120M3S**

### Features

- Typ.  $R_{DS(on)} = 29 \text{ m}\Omega$  @  $V_{GS} = 18 \text{ V}$
- Ultra Low Gate Charge ( $Q_{G(tot)} = 107 \text{ nC}$ )
- High Speed Switching with Low Capacitance ( $C_{oss} = 106 \text{ pF}$ )
- 100% Avalanche Tested
- AEC Q101 Qualified and PPAP Capable

# NVH4L030N120M3S

**Table 1. THERMAL CHARACTERISTICS**

Parameter	Symbol	Max	Unit
Junction-to-Case – Steady State (Note 1)	$R_{\theta JC}$	0.48	°C/W
Junction-to-Ambient – Steady State (Note 1)	$R_{\theta JA}$	40	

**Table 2. ELECTRICAL CHARACTERISTICS** ( $T_J = 25^\circ\text{C}$  unless otherwise specified)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
<b>OFF-STATE CHARACTERISTICS</b>						
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0\text{ V}, I_D = 1\text{ mA}$	1200	–	–	V
Drain-to-Source Breakdown Voltage Temperature Coefficient	$V_{(BR)DSS}/T_J$	$I_D = 1\text{ mA}$ , referenced to $25^\circ\text{C}$ (Note 6)	–	0.3	–	V/°C
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{GS} = 0\text{ V}, V_{DS} = 1200\text{ V}$   $T_J = 25^\circ\text{C}$	–	–	100	$\mu\text{A}$
Gate-to-Source Leakage Current	$I_{GSS}$	$V_{GS} = +22/-10\text{ V}, V_{DS} = 0\text{ V}$	–	–	$\pm 1$	$\mu\text{A}$
<b>ON-STATE CHARACTERISTICS</b> (Note 2)						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{GS} = V_{DS}, I_D = 15\text{ mA}$	2.04	2.4	4.4	V
Recommended Gate Voltage	$V_{GOP}$		–3	–	+18	V

Drain-to–

# NVH4L030N120M3S

**Table 2. ELECTRICAL CHARACTERISTICS** ( $T_J = 25^\circ\text{C}$  unless otherwise specified) (continued)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
<b>SOURCE-DRAIN DIODE CHARACTERISTICS</b>						
Reverse Recovery Time	$t_{RR}$	$V_{GS} = -3/18\text{ V}, I_{SD} = 30\text{ A},$ $di_S/dt = 1000\text{ A}/\mu\text{s}, V_{DS} = 800\text{ V}$ (Note 6)	-	20	-	ns
Reverse Recovery Charge	$Q_{RR}$		-	114	-	nC
Reverse Recovery Energy	$E_{REC}$		-	10.5	-	$\mu\text{J}$
Peak Reverse Recovery Current	$I_{RRM}$		-	11	-	A
Charge Time	$T_A$		-	11	-	ns
Discharge Time	$T_B$		-	8.5	-	ns

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.

5.  $E_{ON}/E_{OFF}$  result is with body diode.

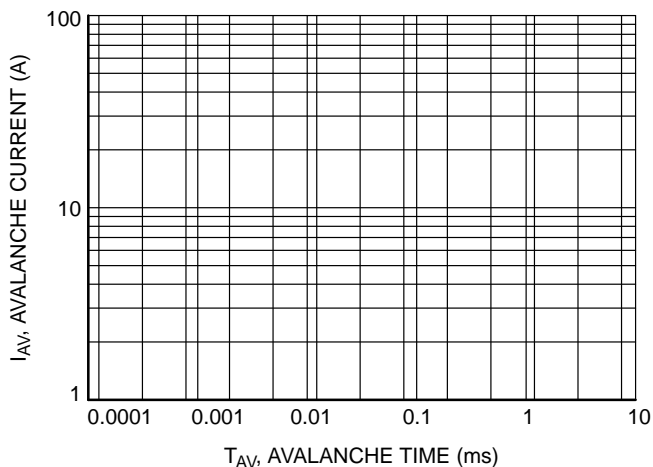
6. Defined by design, not subject to production test.

**NVH4L030N120M3S**

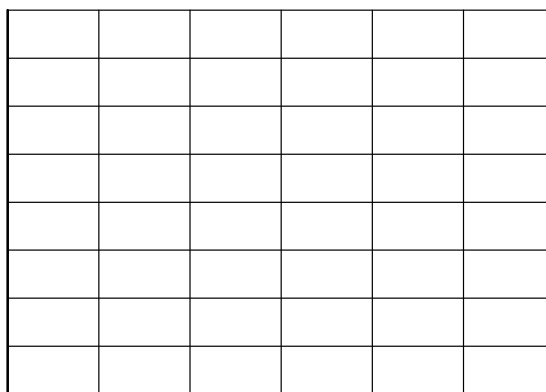


# NVH4L030N120M3S

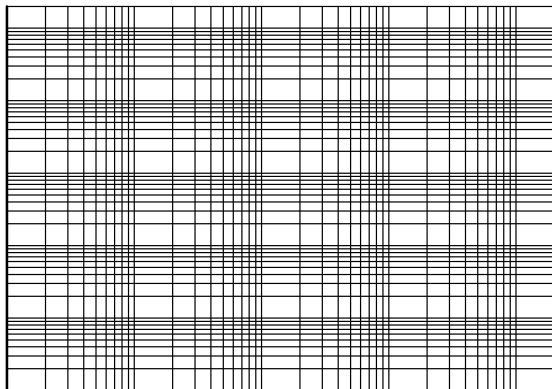
## TYPICAL CHARACTERISTICS



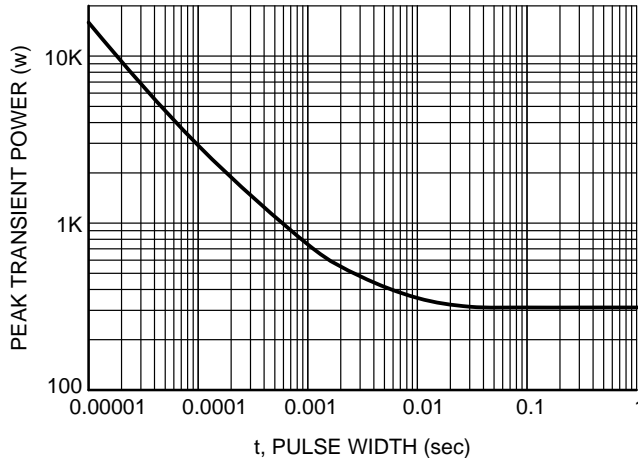
**Figure 13. Unclamped Inductive Switching Capability**



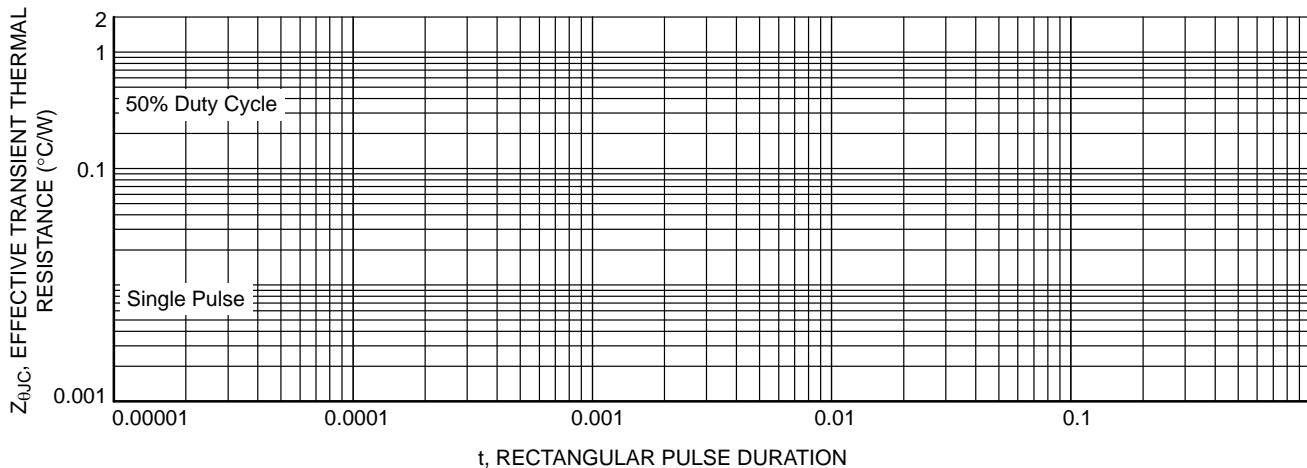
**Figure 14. Maximum Continuous Drain Current vs. Case Temperature**



**Figure 15. Safe Operating Area**



**Figure 16. Single Pulse Maximum Power Dissipation**



**Figure 17. Junction-to-Case Transient Thermal Response**

TO-247-4LD  
CASE 340CJ  
ISSUE A

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A E A B  
A2 E1  $\emptyset$ p1  
D2

E/2 Q

D D1

$\emptyset$

L1

b2 A1

b1 (3X) L

1 4

e1 b(4X) c

e 2X

$\oplus$  0.254 (M) B A (M)

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