

650, 2, -33, -247-4, 4, 045 065 1

Features

- Typ. $R_{DS(on)}$ = 33 m Ω @ V_{GS} = 18 V
Typ. $R_{DS(on)}$ = 45 m Ω @ V_{GS} = 15 V
- Ultra Low Gate Charge ($Q_{G(tot)}$ = 105 nC)
- High Speed Switching with Low Capacitance (C_{oss} = 162 pF)
- 100% Avalanche Tested
- AEC-Q101 Qualified and PPAP Capable
- This Device is Halide Free and RoHS Compliant with exemption 7a, Pb-Free 2LI (on second level interconnection)

Typical Applications

- Automotive On Board Charger
- Automotive DC-DC Converter for EV/HEV

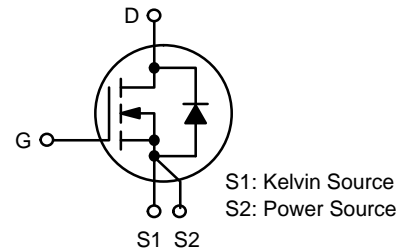
MAXIMUM RATINGS (T_J = 25°C unless otherwise noted)

Parameter	Symbol	Value	Unit		
Drain to Source Voltage	V_{DSS}	650	V		
Gate to Source Voltage	V_{GS}	8/+22	V		
Recommended Operation Values of Gate to Source Voltage	V_{GSop}	5/+18	V		
Continuous Drain Current (Note 2)	Steady State	$T_C = 25^\circ\text{C}$	I_D	55	A
			P_D	187	W
Continuous Drain Current (Notes 1, 2)	Steady State	$T_C = 100^\circ\text{C}$	I_D	39	A
			P_D	94	W
Pulsed Drain Current (Note 3)		$T_C = 25^\circ\text{C}$	I_{DM}	197	A
Single Pulse Surge Drain Current Capability		$T_A = 25^\circ\text{C}$, $t_p = 10 \mu\text{s}$, $R_G = 4.7 \Omega$	I_{DSC}	315	A
Operating Junction and Storage Temperature Range	T_J, T_{stg}	55 to +175		°C	
Source Current (Body Diode)	I_S	45	A		
Single Pulse Drain to Source Avalanche Energy ($I_{L(pk)} = 12 \text{ A}$, $L = 1 \text{ mH}$) (Note 4)	$-E_{AS}$	72	mJ		
Maximum Lead Temperature for Soldering (1/8" from case for 5 s)	T_L	300	°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. JA is constant value to follow guide table of LV/HV discrete final datasheet generation.
2. The entire application environment impacts the thermal resistance values shown, they are not constants and are only valid for the particular conditions noted.
3. Repetitive rating, limited by max junction temperature.
4. EAS of 72 mJ is based on starting $T_J = 25^\circ\text{C}$; $L = 1 \text{ mH}$, $I_{AS} = 12 \text{ A}$, $V_{DD} = 50 \text{ V}$, $V_{GS} = 18 \text{ V}$.

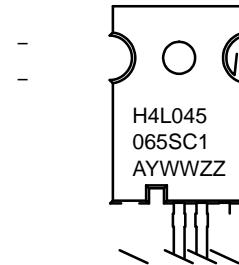
$V_{(BR)DSS}$	$R_{DS(ON)} \text{ MAX}$	$I_D \text{ MAX}$
650 V	50 m Ω @ 18 V	55 A



N-CHANNEL MOSFET

D
S2
S1 G
TO247-4L
CASE 340CJ

MARKING DIAGRAM



H4L045065SC1 = Specific Device Code
A = Assembly Location
Y = Year
WW = Work Week
ZZ = Lot Traceability

ORDERING INFORMATION

Device	Package	Shipping
NVH4L045N065SC1	TO247 4L	30 Units / Tube

NVH4L045N065SC1

THERMAL RESISTANCE MAXIMUM RATINGS

Parameter	Symbol	Max	Unit
Junction to Case Steady State (Note 2) - -	$R_{\theta JC}$	0.8	°C/W
Junction to Ambient Steady State (Notes-1, 2) -	$R_{\theta JA}$	40	

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

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
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OFF CHARACTERISTICS

Drain to Source Breakdown Voltage - -	$V_{(BR)DSS}$	$V_{GS} = 0\text{ V}, I_D = 1\text{ mA}$				
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NVH4L045N065SC1

ELECTRICAL CHARACTERISTICS (T_J = 25°C unless otherwise specified) (continued)

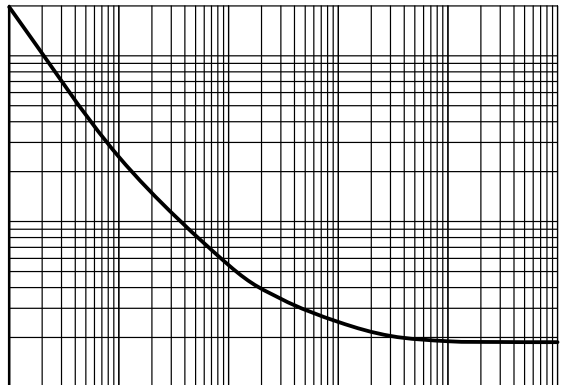
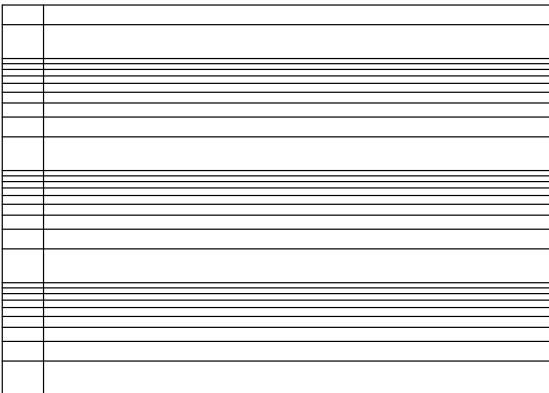
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
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DRAIN-SOURCE DIODE CHARACTERISTICS

Reverse Recovery Time	t _{RR}	V _{GS} = 5/18 V, I _{SD} = 25 A, di _S /dt = 1000 A/μs	-	20		ns -
Reverse Recovery Charge	Q _{RR}			108		nC -
Reverse Recovery Energy	E _{REC}					

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TYPICAL CHARACTERISTICS (continued)



NVH4L045N065SC1

TYPICAL CHARACTERISTICS (continued)

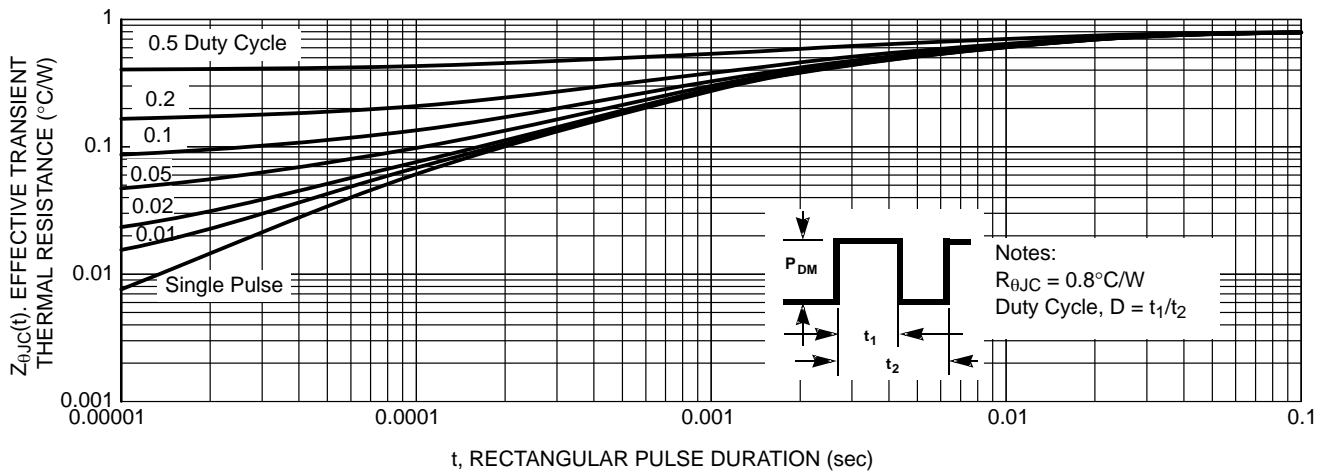


Figure 13. Junction-to-Case Thermal Response

TO-247-4LD
CASE 340CJ
ISSUE A

DATE 16 SEP 2019

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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