

Automotive 750 V, 600 A Dual Side Cooling Half-Bridge Power Module

VE-Trac™ Dual Gen II NVG600A75L4DSC2

Product Description

The NVG600A75L4DSC2 is part of a family of power modules with dual side cooling and compact footprints for Hybrid (HEV) and Electric Vehicle (EV) traction inverter application.

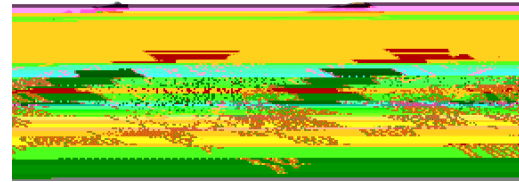
The module consists of two narrow mesa Field Stop (FS4) IGBTs in a half-bridge configuration. The chipset utilizes the new narrow mesa IGBT technology in providing high current density and robust short circuit protection with higher blocking voltage to deliver outstanding performance in EV traction applications.

Liquid cooling heatsink reference design, loss models and CAD models are available to support customers in inverter designs.

Features

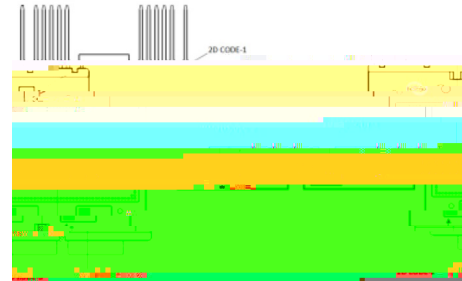
- Dual-Side Cooling
- Integrated Chip Level Temperature and Current Sensor
- $T_{vj\ max} = 175^{\circ}\text{C}$ for Continuous Operation
- Low-Stray Inductance
- Low Conduction and Switching Losses
- Automotive Grade
- 4.2 kV Isolated DBC Substrate
-

High Power DC-DC Boost Converter

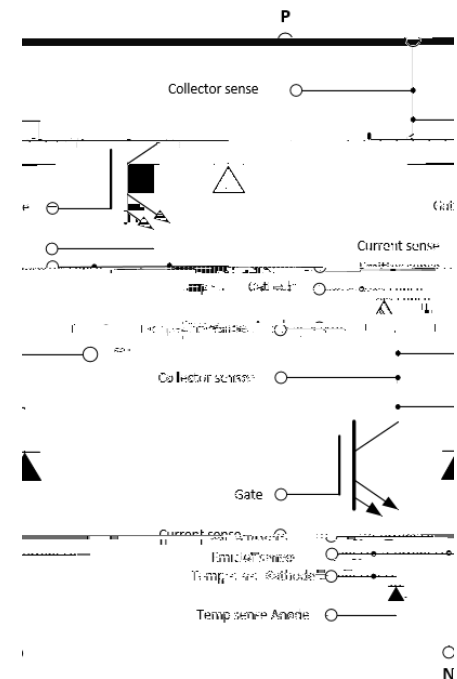


AHPM15-CEA
 CASE MODHS

MARKING DIAGRAM



- ZZZ = Assembly Lot Code
- AT = Assembly & Test Location
- Y = Year
- WW = Work Week
- XXXX = Specific Device Code



ORDERING INFORMATION

See detailed ordering and shipping information on page 5 of this data sheet.

VE-Trac™ Dual Gen II NVG600A75L4DSC2

PIN DESCRIPTION

Pin #	Pin	Pin Function Description	Pin Arrangement
1	N	Low Side Emitter	
2	P	High Side Collector	
3	H/S COLLECTOR SENSE	High Side Collector Sense	
4	H/S CURRENT SENSE	High Side Current Sense	
5	H/S EMITTER SENSE	High Side Emitter Sense	
6	H/S GATE	High Side Gate	
7	H/S TEMP SENSE (CATHODE)		

VE-Trac™ Dual Gen II NVG600A75L4DSC2

ABSOLUTE MAXIMUM RATINGS (T_{VJ} = 25°C, unless otherwise specified)

Symbol	Parameter	Rating	Unit
--------	-----------	--------	------

IGBT

V _{CES}	Collector to Emitter Voltage	750	V
V _{GES}	Gate to Emitter Voltage	±20	V
I _{CN}	Implemented Collector Current	600	A
I _{C nom}	Continuous DC Collector Current, T _{vjmax} = 175°C, T _F = 65°C, Ref. Heatsink	500	A
I _{CRM}	Pulsed Collector Current @ V _{GE} = 15 V, t _p = 1 ms	1200	A

DIODE

V _{RRM}	Repetitive Peak Reverse Voltage	750	V
I _{FN}	Implemented Forward Current	600	A
I _F	Continuous Forward Current, T _{vjmax} = 175°C, T _F = 65°C, Ref. Heatsink	400	A
I _{FRM}	Repetitive Peak Forward Current, t _p = 1 ms	1200	A

1



VE-Trac™ Dual Gen II NVG600A75L4DSC2

CHARACTERISTICS OF INVERSE DIODE (T_{vj} = 25°C, unless otherwise specified)

Parameters		Conditions	Min	Typ	Max	unit	
V _F	Diode Forward Voltage	V _{GE} = 0 V, I _C = 400 A,	T _{vj} = 25°C	–	1.34	1.47	V
			T _{vj} = 150°C	–	1.30	–	
			T _{vj} = 175°C	–	1.29	–	
		V _{GE} = 0 V, I _C = 600 A,	T _{vj} = 25°C	–	1.48	–	
			T _{vj} = 150°C	–	1.47	–	
			T _{vj} = 175°C	–	1.46	–	
E _{rr}	Reverse Recovery Energy	V _R = 400 V, I _F = 400 A, R _{GON} = 3.9 Ω, –di/dt = 3.61 A/ns (175°C) V _{GE} = –8 V	T _{vj} = 25°C	–	1.05	–	mJ
			T _{vj} = 150°C	–	4.93	–	
			T _{vj} = 175°C	–	5.90	–	
				–	–	–	
Q _{RR}	Recovered Charge	V _R = 400 V, I _F = 400 A, R _{GON} = 3.9 Ω, –di/dt = 3.61 A/ns (175°C) V _{GE} = –8 V	T _{vj} = 25°C	–	11.60	–	μC
			T _{vj} = 150°C	–	25.72	–	
			T _{vj} = 150°C	–	29.28	–	
				–	–	–	
I _{rr}	Peak Reverse Recovery Current	V _R = 400 V, I _F = 400 A, R _{GON} = 3.9 Ω, –di/dt = 3.61 A/ns (175°C) V _{GE} = –8 V	T _{vj} = 25°C	–	241	–	A
			T _{vj} = 150°C	–	294	–	
			T _{vj} = 175°C	–	304	–	
				–	–	–	

SENSOR CHARACTERISTICS (T_{vj} = 25°C, unless otherwise specified)

Parameters		Conditions	Min	Typ	Max	unit	
T _{sense}	Temperature Sense	I _F = 1 mA,	T _{vj} = 25°C	–	2.5	–	V
			T _{vj} = 150°C	–	1.7	–	
			T _{vj} = 175°C	–	1.5	–	
I _{sense}	Current Sense	R _{shunt} = 10 Ω,	I _C = 1200 A	–	416	–	mV
			I _C = 600 A	–	223	–	
			I _C = 100 A	–	50	–	
				–	–	–	

ORDERING INFORMATION

Part Number	Package	Shipping
NVG600A75L4DSC2	AHPM15–CEA Module Case MODHS (Pb–Free)	18 Units / 3x Tub

VE-Trac™ Dual Gen II NVG600A75L4DSC2

TYPICAL CHARACTERISTICS

VE-Trac™ Dual Gen II NVG600A75L4DSC2

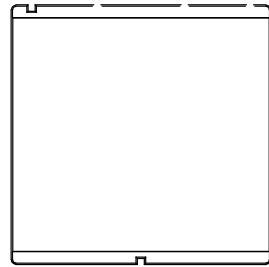
VE-Trac™ Dual Gen II NVG600A75L4DSC2

CASE MODHS
ISSUE B

DATE 06 MAY 2022

PRF.

4. DIMENSIONS b,b1,b2 DO NOT INCLUDE



CASE MODHS
ISSUE B

DATE 06 MAY 2022

ZZZ = Assembly Lot Code
AT = Assembly & Test Location
Y = Year
WW = Work Week
XXXX = Specific Device Code

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. **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**
