Automotive 750 V, 800 A Dual Side Cooling Half-Bridge Power Module

VE-Trac™ Dual Gen II NVG800A75L4DSB2

Product Description

The NVG800A75L4DSB2 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°C for Continuous Operation
- Low−stray Inductance
- Low Conduction and Switching Losses
- Automotive Grade
- 4.2 kV Isolated DBC Substrate
- AEC Qualified and PPAP Capable
- This Device is Pb−Free and is RoHS Compliant

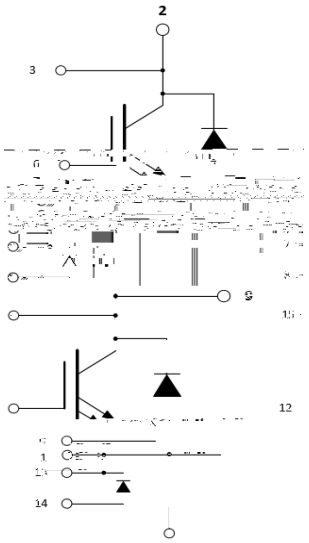
Typical Applications

- Hybrid and Electric Vehicle Traction Inverter
- High Power DC−DC Converter

ORDERING INFORMATION

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

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)	High Side Temp sense Diode Cathode	
8	H/S TEMP SENSE (ANODE)	High Side Temp sense Diode Anode	
9	~	Phase Output	
10	L/S CURRENT SENSE	Low Side Current Sense	
11	L/S EMITTER SENSE	Low Side Emitter Sense	
12	L/S GATE	Low Side Gate	
13	L/S TEMP SENSE (CATHODE)	Low Side Temp sense Diode Cathode	
14	L/S TEMP SENSE (ANODE)	Low Side Temp sense Diode Anode	
15	L/S COLLECTOR SENSE	Low Side Collector Sense	

Materials

DBC Substrate: Al_2O_3 isolated substrate, basic isolation, and copper on both sides.

Lead Frame

Copper with Tin electro−plating.

Flammability Information

All materials present in the power module meet UL flammability rating class 94V−0.

MODULE CHARACTERISTICS

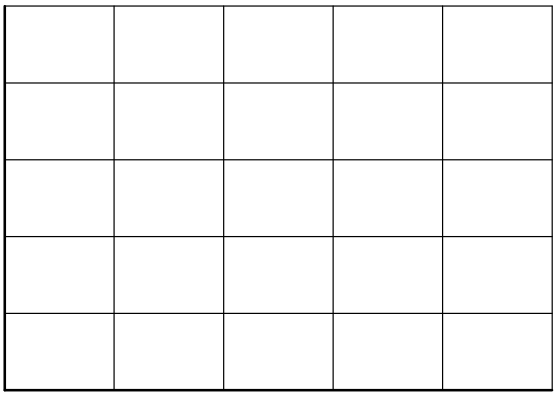
Symbol	Parameter			Rating	Unit
T_{vj}	Continuous Operating Junction Temperature Range			−40 to 175	°C
T_{STG}	Storage Temperature range			−40 to 125	°C
V_{ISO}	Isolation Voltage, AC, f = 50 Hz, t = 1 s			4200	V
Creepage	Minimum: Terminal to Terminal			5.0	mm
Clearance	Minimum: (Note 1) Terminal to Terminal			3.2	mm
CTI	Comparative Tracking Index			>600	
		Min	**Typ**	**Max**	
L_{sCE}	Stray Inductance		8		nH
$R_{CC'+EE'}$	Module Lead Resistance, Terminals − Chip		0.15		mΩ
G	Module Weight		75		g
M	M4 Screws for Module Terminals			2.2	Nm

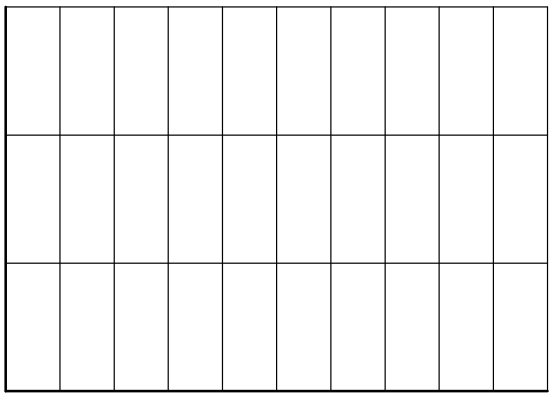
1. Verified by design / not by test.

CHARACTERISTICS OF IGBT (Tvj = 25°C, Unless Otherwise Specified)

Parameters	Conditions	Min	Typ	Max	Unit
V_{CESAT}					

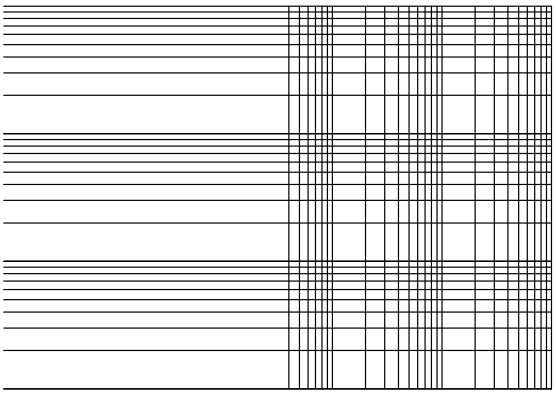
TYPICAL CHARACTERISTICS

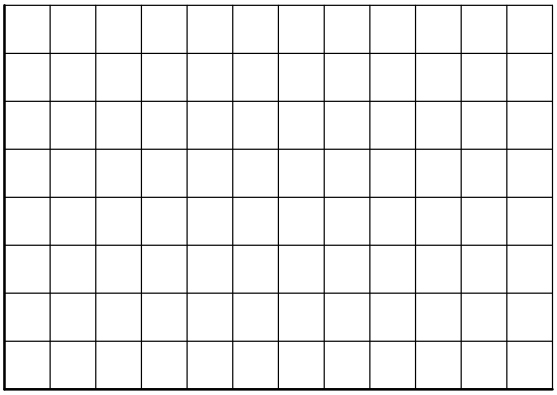


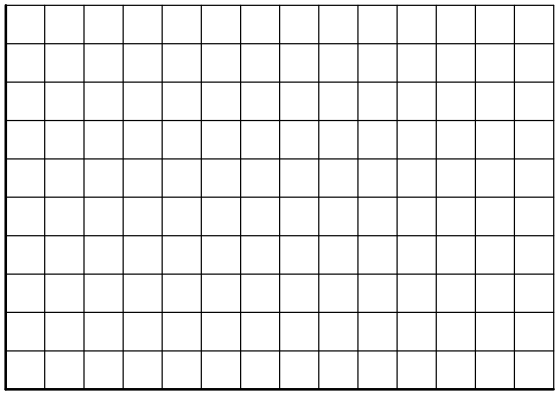


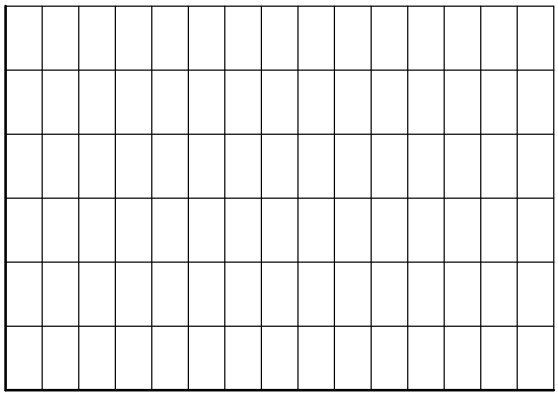
VE Trac™ Dual Gen II NVG800A75L4DSB2

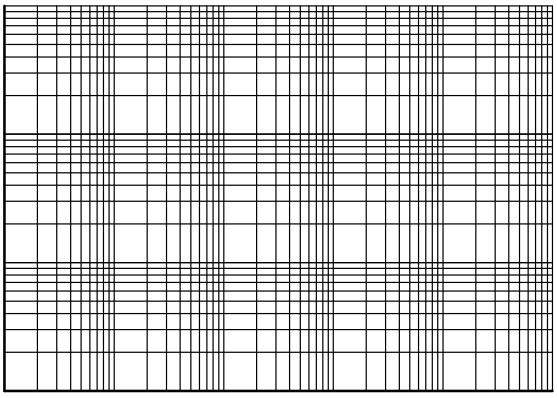
TYPICAL CHARACTERISTICS











TYPICAL CHARACTERISTICS

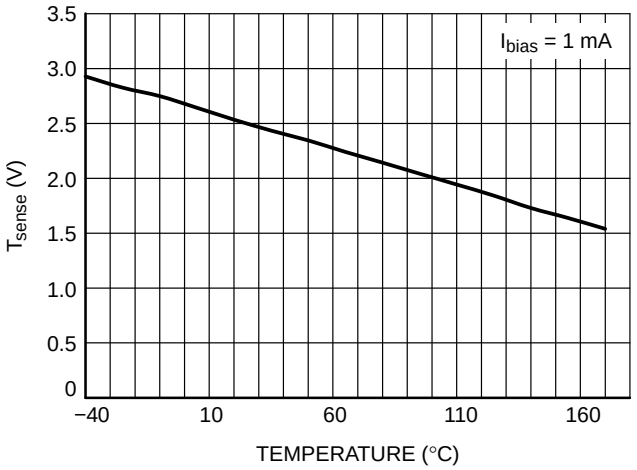


Figure 19. Temperature Sensor Characteristics

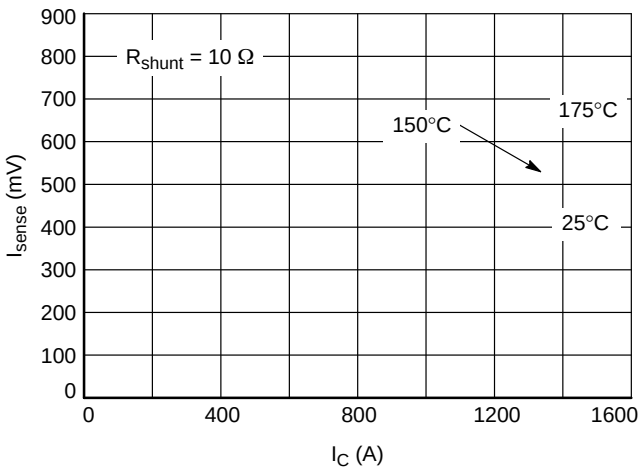


Figure 20. Current Sensor Characteristic

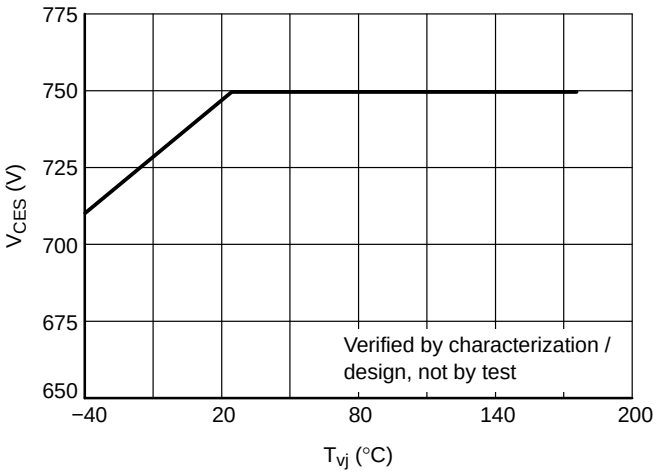
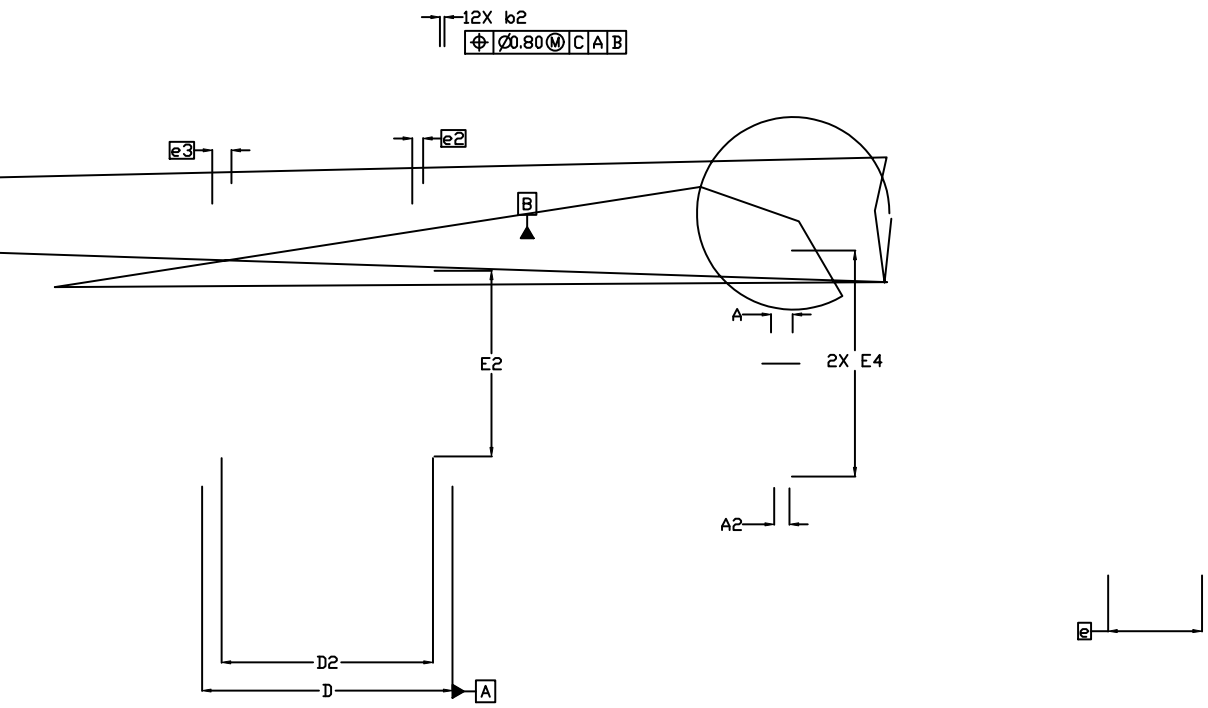


Figure 21. Maximum Allowed V_{CE}

Gen II DSC AHPM15 CEC
CASE MODHV
ISSUE O

DATE 16 DEC 2021



DIM	MILLIMETERS		
	MIN.	NOM.	MAX.
A	4.65	4.70	4.75
A1	18.82	19.17	19.52

Gen II DSC AHPM15 CEC
CASE MODHV
ISSUE O

DATE 16 DEC 2021