

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

## VE-Trac™ Dual NVG800A75L4DSB

### Product Description

The NVG800A75L4DSB 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.

### Features

- Dual-Side Cooling
- Integrated Chip Level Temperature and Current Sensor
- $T_{vj\ max} = 175^{\circ}\text{C}$  for Continuous Operation
- Ultra-low Stray Inductance
- Low  $V_{CESAT}$  and Switching Losses
- Automotive Grade FS4 IGBT & Soft Diode Chip Technologies
- 4.2 kV Isolated DBC Substrate
- This Device is RoHS Compliant

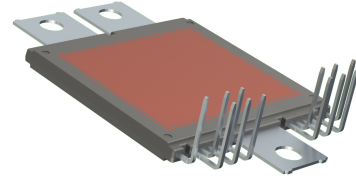
### Typical Applications

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

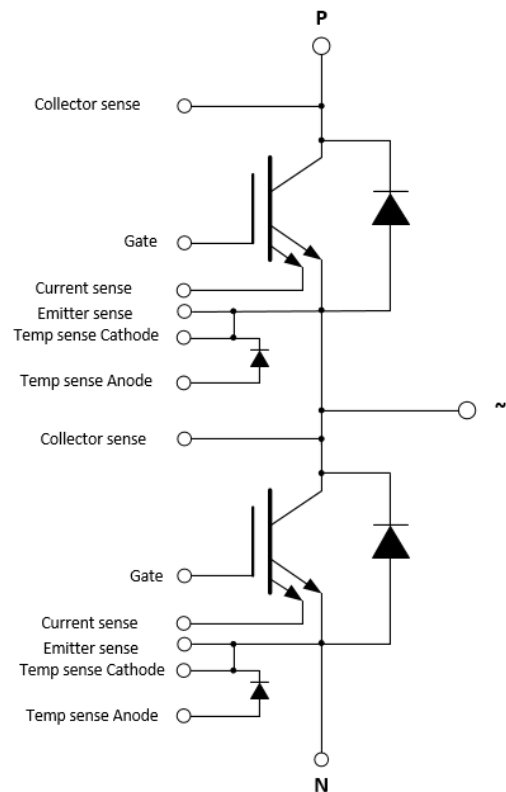


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AHPM15-CEC  
CASE 100DV



### ORDERING INFORMATION

See detailed ordering and shipping information on page 11 of this data sheet.

# VE-Trac™ Dual NVG800A75L4DSB

## 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<sub>2</sub>O<sub>3</sub> 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 <sub>vj</sub>      | Continuous Operating Junction Temperature Range | -40 to 175 | °C         |            |    |
| T <sub>STG</sub>     | Storage Temperature Range                       | -40 to 125 | °C         |            |    |
| V <sub>ISO</sub>     | Isolation Voltage, DC, t = 1 s                  | 4200       | V          |            |    |
| Creepage             | Terminal to Terminal                            | 6.0        | mm         |            |    |
| Clearance            | Terminal to Terminal                            | 3.2        | mm         |            |    |
| CTI                  | Comparative Tracking Index                      | >600       | -          |            |    |
|                      |   | <b>Min</b> | <b>Typ</b> | <b>Max</b> |    |
| L <sub>sCE</sub>     | Stray Inductance                                |            | 8          |            | nH |
| R <sub>CC'+EE'</sub> | Module Lead Resistance, Terminals - Chip        |            | 0.15       |            | mΩ |
| G                    | Module Weight                                   |            | 75         |            | g  |
| M                    | M4 Screws for Module Terminals                  |            |            | 2.2        | Nm |

# VE-Trac™ Dual NVG800A75L4DSB

## ABSOLUTE MAXIMUM RATINGS (T<sub>VJ</sub> = 25°C, Unless Otherwise Specified)

| Symbol             | Parameter   | Rating       | Unit |
|--------------------|---|--------------|------|
| <b>IGBT</b>        |   |              |      |
| V <sub>CES</sub>   | Collector to Emitter Voltage  | 750          | V    |
| V <sub>GES</sub>   | Gate to Emitter Voltage   | ±20          | V    |
| I <sub>CN</sub>    | Implemented Collector Current   | 800          | A    |
| I <sub>C nom</sub> | Continuous DC Collector Current, T <sub>VJmax</sub> = 175°C, T <sub>F</sub> = 65°C, Ref. Heatsink | 550 (Note 1) | A    |
| I <sub>CRM</sub>   | Pulsed Collector Current @ V <sub>GE</sub> = 15 V, t <sub>p</sub> = 1 ms                          | 1600         | A    |

## DIODE

|                        |   |                |                  |
|------------------------|---|----------------|------------------|
| V <sub>RRM</sub>       | Repetitive Peak Reverse Voltage   | 750            | V                |
| I <sub>FN</sub>        | Implemented Forward Current   | 800            | A                |
| I <sub>F</sub>         | Continuous Forward Current, T <sub>VJmax</sub> = 175°C, T <sub>F</sub> = 65°C, Ref. Heatsink        | 420 (Note 1)   | A                |
| I <sub>FRM</sub>       | Repetitive Peak Forward Current, t <sub>p</sub> = 1 ms  | 1600           | A                |
| I <sup>2</sup> t value | V <sub>R</sub> = 0 V, t <sub>p</sub> = 10 ms,<br>T <sub>VJ</sub> = 150°C<br>T <sub>VJ</sub> = 175°C | 20000<br>18000 | A <sup>2</sup> s |

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. Verified by characterization, not by test.

## THERMAL CHARACTERISTICS (Verified by characterization, not by test.)

| Symbol                    | Parameter   | Min | Typ  | Max  | Unit |
|---------------------------|---|-----|------|------|------|
| IGBT.R <sub>th,J-C</sub>  | Effective Rth, Junction to Case (Note 2)  |     | 0.05 | 0.07 | °C/W |
| IGBT.R <sub>th,J-F</sub>  | Effective Rth, Junction to Fluid, λ <sub>TJM</sub> = 6 W/m-K, F = 660 N<br>10 L/min, 65°C, 50/50 EGW, Ref. Heatsink |     | 0.14 |      | °C/W |
| Diode.R <sub>th,J-C</sub> | Effective Rth, Junction to Case (Note 2)  |     | 0.08 | 0.10 | °C/W |
| Diode.R <sub>th,J-F</sub> | Effective Rth, Junction to Fluid, λ <sub>TJM</sub> = 6 W/m-K, F = 660 N<br>10 L/min, 65°C, 50/50 EGW, Ref. Heatsink |     | 0.21 |      | °C/W |

2. For the measurement point of case temperature (T<sub>c</sub>), DBC discoloration, picker circle print is allowed, please refer to the VE-Trac Dual assembly guide for additional details about acceptable DBC surface finish.

# VE-Trac™ Dual NVG800A75L4DSB

## CHARACTERISTICS OF IGBT (T<sub>vj</sub> = 25°C, Unless Otherwise Specified)

| Parameters         | Conditions   | Min | Typ   | Max  | Unit |
|--------------------|--|-----|-------|------|------|
| V <sub>CESAT</sub> | Collector to Emitter Saturation Voltage (Terminal)<br>V <sub>GE</sub> = 15 V, I <sub>C</sub> = 600 A, T <sub>vj</sub> = 25°C<br>T <sub>vj</sub> = 150°C<br>T <sub>vj</sub> = 175°C   | -   | 1.30  | 1.55 | V    |
|                    |  | -   | 1.42  | -    |      |
|                    |  | -   | 1.45  | -    |      |
|                    | V <sub>GE</sub> = 15 V, I <sub>C</sub> = 800 A, T <sub>vj</sub> = 25°C<br>T <sub>vj</sub> = 150°C<br>T <sub>vj</sub> = 175°C   | -   | 1.44  | -    |      |
|                    |  | -   | 1.64  | -    |      |
|                    |  | -   | 1.68  | -    |      |
| I <sub>CES</sub>   | Collector to Emitter Leakage Current<br>V <sub>GE</sub> = 0, V <sub>CE</sub> = 750 V<br>T <sub>vj</sub> = 25°C<br>T <sub>vj</sub> = 175°C  | -   | -     | 1    | mA   |
| I <sub>GES</sub>   | Gate – Emitter Leakage Current<br>V <sub>CE</sub> = 0, V <sub>GE</sub> = ±20 V   | -   | -     | ±400 | nA   |
| V <sub>th</sub>    | Threshold Voltage<br>V <sub>CE</sub> = V <sub>GE</sub> , I <sub>C</sub> = 500 mA   | 4.6 | 5.5   | 6.2  | V    |
| Q <sub>G</sub>     | Total Gate Charge<br>V <sub>GE</sub> = -8 to 15 V, V <sub>CE</sub> = 400 V   | -   | 2.2   | -    | μC   |
| R <sub>Gint</sub>  | Internal Gate Resistance   | -   | 2     | -    | Ω    |
| C <sub>ies</sub>   | Input Capacitance<br>V <sub>CE</sub> = 30 V, V <sub>GE</sub> = 0 V, f = 1 MHz  | -   | 48    | -    | nF   |
| C <sub>oes</sub>   | Output Capacitance<br>V <sub>CE</sub> = 30 V, V <sub>GE</sub> = 0 V, f = 1 MHz   | -   | 1.37  | -    | nF   |
| C <sub>res</sub>   | Reverse Transfer Capacitance<br>V <sub>CE</sub> = 30 V, V <sub>GE</sub> = 0 V, f = 1 MHz   | -   | 0.15  | -    | nF   |
| T <sub>d,on</sub>  | Turn On Delay, Inductive Load<br>I <sub>C</sub> = 600 A, V <sub>CE</sub> = 400 V<br>V <sub>GE</sub> = +15/-8 V<br>R <sub>g,on</sub> = 4.7 Ω<br>T <sub>vj</sub> = 25°C<br>T <sub>vj</sub> = 150°C<br>T <sub>vj</sub> = 175°C  | -   | 253   | -    | ns   |
|                    |  | -   | 282   | -    |      |
|                    |  | -   | 287   | -    |      |
| T <sub>r</sub>     | Rise Time, Inductive Load<br>I <sub>C</sub> = 600 A, V <sub>CE</sub> = 400 V<br>V <sub>GE</sub> = +15/-8 V<br>R <sub>g,on</sub> = 4.7 Ω<br>T <sub>vj</sub> = 25°C<br>T <sub>vj</sub> = 150°C<br>T <sub>vj</sub> = 175°C  | -   | 94    | -    | ns   |
|                    |  | -   | 112   | -    |      |
|                    |  | -   | 117   | -    |      |
| T <sub>d,off</sub> | Turn Off Delay, Inductive Load<br>I <sub>C</sub> = 600 A, V <sub>CE</sub> = 400 V<br>V <sub>GE</sub> = +15/-8 V<br>R <sub>g,off</sub> = 15 Ω<br>T <sub>vj</sub> = 25°C<br>T <sub>vj</sub> = 150°C<br>T <sub>vj</sub> = 175°C   | -   | 760   | -    | ns   |
|                    |  | -   | 790   | -    |      |
|                    |  | -   | 800   | -    |      |
| T <sub>f</sub>     | Fall Time, Inductive Load<br>I <sub>C</sub> = 600 A, V <sub>CE</sub> = 400 V<br>V <sub>GE</sub> = +15/-8 V<br>R <sub>g,off</sub> = 15 Ω<br>T <sub>vj</sub> = 25°C<br>T <sub>vj</sub> = 150°C<br>T <sub>vj</sub> = 175°C  | -   | 95    | -    | ns   |
|                    |  | -   | 140   | -    |      |
|                    |  | -   | 153   | -    |      |
| E <sub>ON</sub>    | Turn-On Switching Loss (including diode reverse recovery loss)<br>I <sub>C</sub> = 600 A, V <sub>CE</sub> = 400 V, V <sub>GE</sub> = +15/-8 V,<br>L <sub>s</sub> = 20 nH, R <sub>g,on</sub> = 4,7 Ω<br>di/dt (T <sub>vj</sub> = 25°C) = 5.13 A/ns<br>di/dt (T <sub>vj</sub> = 175°C) = 4.11 A/ns<br>T <sub>vj</sub> = 25°C<br>T <sub>vj</sub> = 150°C<br>T <sub>vj</sub> = 175°C | -   | 21.30 | -    | mJ   |
|                    |  | -   | 32.55 | -    |      |
|                    |  | -   | 33.66 | -    |      |
| E <sub>OFF</sub>   | Turn-Off Switching Loss<br>I <sub>C</sub> = 600 A, V <sub>CE</sub> = 400 V, V <sub>GE</sub> = +15/-8 V,<br>L <sub>s</sub> = 20 nH, R <sub>g,off</sub> = 15 Ω<br>dv/dt (T <sub>vj</sub> = 25°C) = 2.81 V/ns<br>dv/dt (T <sub>vj</sub> = 175°C) = 2.11 V/ns<br>T <sub>vj</sub> = 25°C<br>T <sub>vj</sub> = 150°C<br>T <sub>vj</sub> = 175°C  | -   | 22.62 | -    | mJ   |
|                    |  | -   | 31.77 | -    |      |
|                    |  | -   | 33.60 | -    |      |
| E <sub>SC</sub>    | Minimum Short Circuit Energy Withstand<br>V <sub>GE</sub> = 15 V, V <sub>CC</sub> = 400 V<br>T <sub>vj</sub> = 25°C<br>T <sub>vj</sub> = 175°C   | 5   | -     | -    | J    |
|                    |  | 7.5 | -     | -    |      |

# VE-Trac™ Dual NVG800A75L4DSB

## CHARACTERISTICS OF INVERSE DIODE ( $T_{VJ} = 25^{\circ}\text{C}$ , Unless Otherwise Specified)

| Parameters |                                  | Conditions   | Min                            | Typ | Max   | Unit |               |
|------------|----------------------------------|--|--------------------------------|-----|-------|------|---------------|
| $V_F$      | Diode Forward Voltage (Terminal) | $V_{GE} = 0\text{ V}$ , $I_C = 600\text{ A}$ ,   | $T_{VJ} = 25^{\circ}\text{C}$  | -   | 1.50  | 1.70 | V             |
|            |                                  |  | $T_{VJ} = 150^{\circ}\text{C}$ | -   | 1.46  | -    |               |
|            |                                  |  | $T_{VJ} = 175^{\circ}\text{C}$ | -   | 1.44  | -    |               |
|            |                                  | $V_{GE} = 0\text{ V}$ , $I_C = 800\text{ A}$ ,   | $T_{VJ} = 25^{\circ}\text{C}$  | -   | 1.73  | -    |               |
|            |                                  |  | $T_{VJ} = 150^{\circ}\text{C}$ | -   | 1.69  | -    |               |
|            |                                  |  | $T_{VJ} = 175^{\circ}\text{C}$ | -   | 1.68  | -    |               |
| $E_{rr}$   | Reverse Recovery Energy          | $I_F = 600\text{ A}$ , $V_R = 400\text{ V}$ , $V_{GE} = -8\text{ V}$ ,<br>$R_{g,on} = 4.7\ \Omega$ , $-di/dt = 3.12\text{ A/ns}$ ( $175^{\circ}\text{C}$ ) | $T_{VJ} = 25^{\circ}\text{C}$  | -   | 3.58  | -    | mJ            |
|            |                                  |  | $T_{VJ} = 150^{\circ}\text{C}$ | -   | 11.71 | -    |               |
|            |                                  |  | $T_{VJ} = 175^{\circ}\text{C}$ | -   | 12.33 | -    |               |
|            |                                  |  |                                |     |       |      |               |
| $Q_{RR}$   | Recovered Charge                 | $I_F = 600\text{ A}$ , $V_R = 400\text{ V}$ , $V_{GE} = -8\text{ V}$ ,<br>$R_{g,on} = 4.7\ \Omega$ , $-di/dt = 3.12\text{ A/ns}$ ( $175^{\circ}\text{C}$ ) | $T_{VJ} = 25^{\circ}\text{C}$  | -   | 16.36 | -    | $\mu\text{C}$ |
|            |                                  |  | $T_{VJ} = 150^{\circ}\text{C}$ | -   | 47.65 | -    |               |
|            |                                  |  | $T_{VJ} = 175^{\circ}\text{C}$ | -   | 49.78 | -    |               |
|            |                                  |  |                                |     |       |      |               |
| $I_{rr}$   | Peak Reverse Recovery Current    | $I_F = 600\text{ A}$ , $V_R = 400\text{ V}$ , $V_{GE} = -8\text{ V}$ ,<br>$R_{g,on} = 4.7\ \Omega$ , $-di/dt = 3.12\text{ A/ns}$ ( $175^{\circ}\text{C}$ ) | $T_{VJ} = 25^{\circ}\text{C}$  | -   | 220   | -    | A             |
|            |                                  |  | $T_{VJ} = 150^{\circ}\text{C}$ | -   | 350   | -    |               |
|            |                                  |  | $T_{VJ} = 175^{\circ}\text{C}$ | -   | 360   | -    |               |
|            |                                  |  |                                |     |       |      |               |

## SENSOR CHARACTERISTICS ( $T_{VJ} = 25^{\circ}\text{C}$ , Unless Otherwise Specified)

| Parameters  |                   | Conditions               | Min                            | Typ              | Max  | Unit             |    |
|-------------|-------------------|--------------------------|--------------------------------|------------------|------|------------------|----|
| $T_{sense}$ | Temperature Sense | $I_F = 1\text{ mA}$ ,    | $T_{VJ} = -40^{\circ}\text{C}$ | -                | 2.96 | -                | V  |
|             |                   |                          | $T_{VJ} = 25^{\circ}\text{C}$  | 2.46<br>(Note 3) | 2.54 | 2.60<br>(Note 3) |    |
|             |                   |                          | $T_{VJ} = 150^{\circ}\text{C}$ | -                | 1.76 | -                |    |
|             |                   |                          | $T_{VJ} = 175^{\circ}\text{C}$ | -                | 1.61 | -                |    |
|             |                   |                          |                                |                  |      |                  |    |
| $I_{sense}$ | Current Sense     | $R_{shunt} = 5\ \Omega$  | $I_C = 1600\text{ A}$          | -                | 379  | -                | mV |
|             |                   |                          | $I_C = 800\text{ A}$           | -                | 200  | -                |    |
|             |                   |                          | $I_C = 100\text{ A}$           | -                | 43.0 | -                |    |
|             |                   | $R_{shunt} = 20\ \Omega$ | $I_C = 1600\text{ A}$          | -                | 644  | -                |    |
|             |                   |                          | $I_C = 800\text{ A}$           | -                | 351  | -                |    |
|             |                   |                          | $I_C = 100\text{ A}$           | -                | 94.0 | -                |    |

3. Measured at chip level

IGBT Output Characteristic

$V_{GE} = +15V$

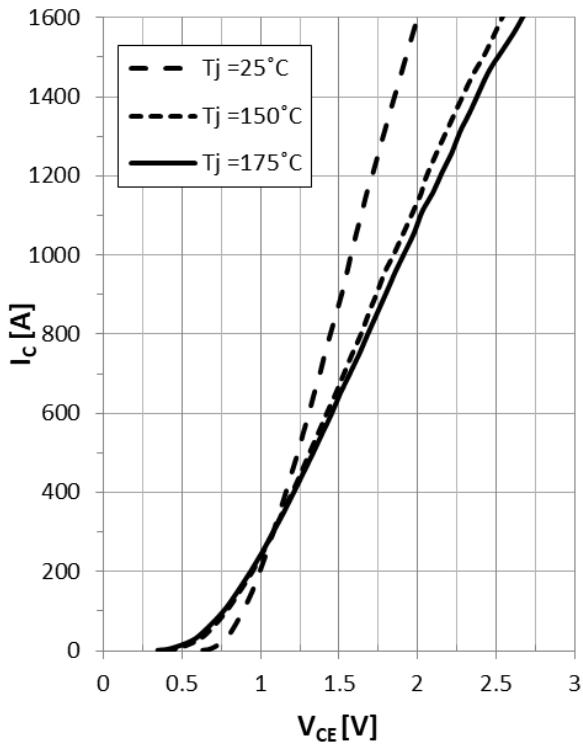


Figure 1. IGBT Output Characteristic

IGBT Transfer Characteristic

$V_{CE} = 20V$

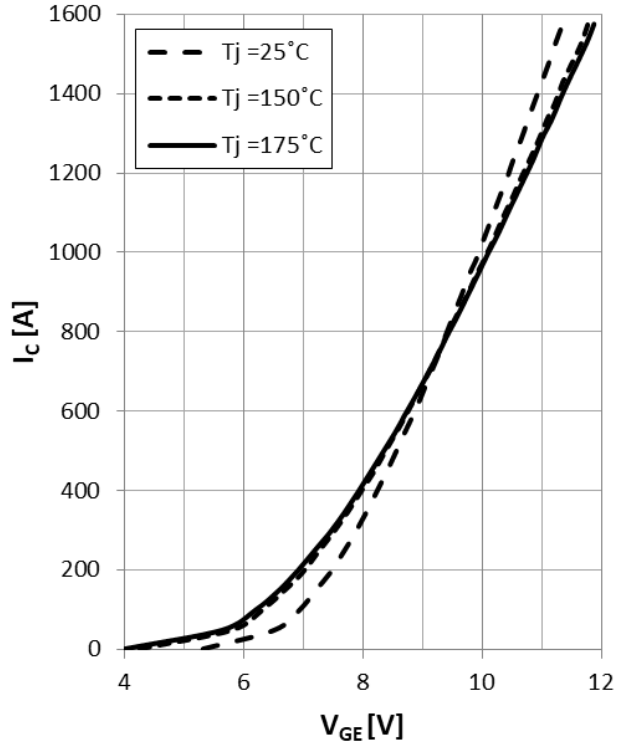


Figure 2. IGBT Transfer Characteristic

IGBT Output Characteristic

$T_j = +25^\circ C$

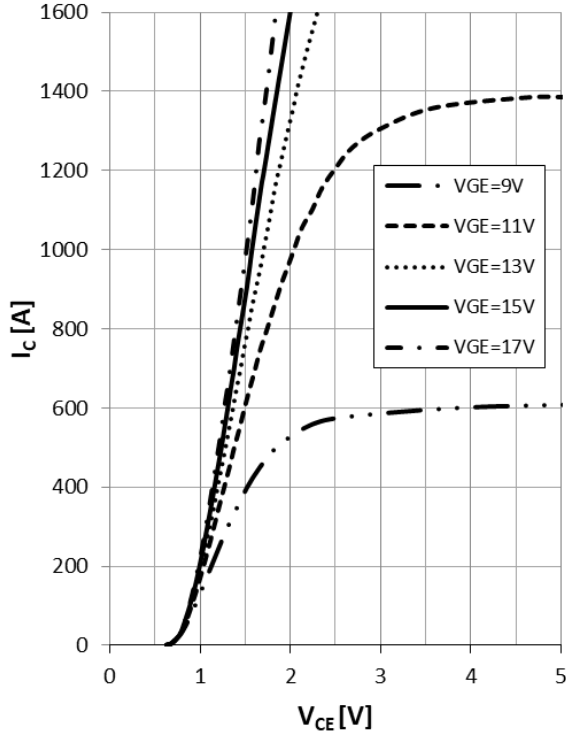


Figure 3. IGBT Output Characteristic

IGBT Output Characteristic

$T_j = +175^\circ C$

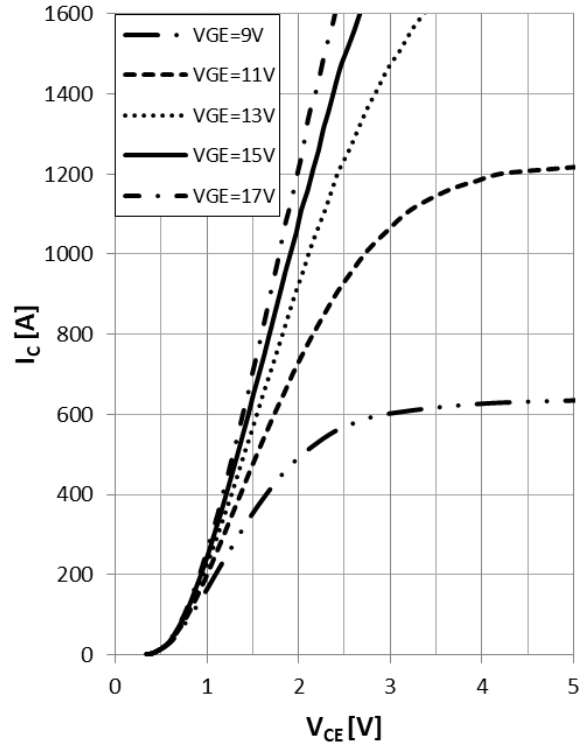


Figure 4. IGBT Output Characteristic

# VE-Trac™ Dual NVG800A75L4DSB

## Gate Charge Characteristic

$V_{CE} = 400V, I_C = 600A, T_{vj} = 25^\circ C$

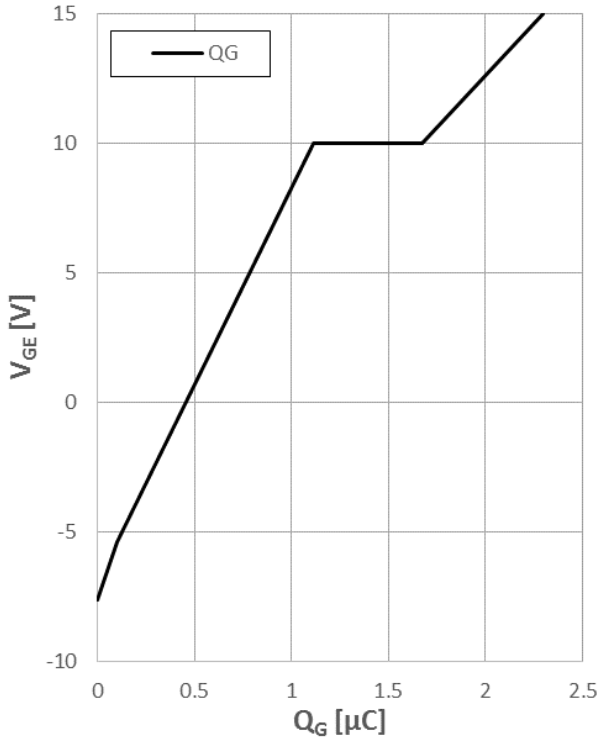


Figure 5. Gate Charge Characteristic

## Capacitance Characteristic

$V_{GE} = 0V, T_{vj} = 25^\circ C, f = 1MHz$

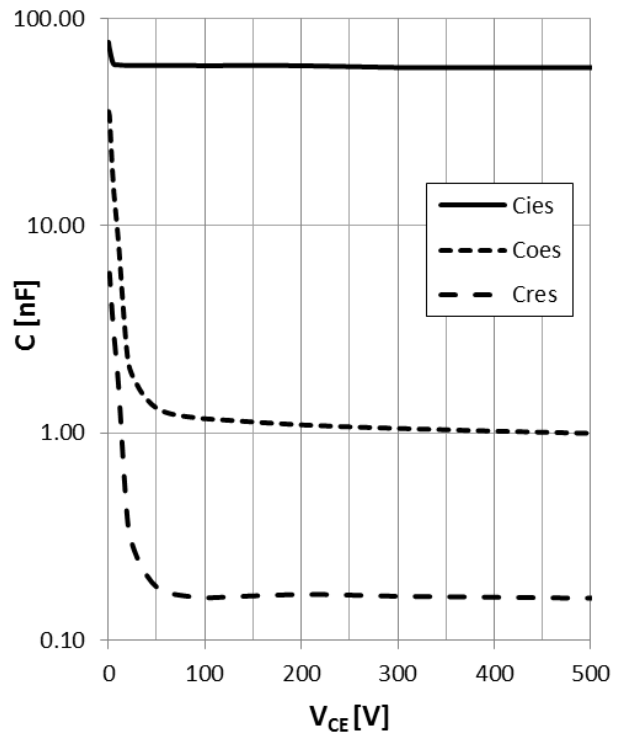


Figure 6. Capacitance Characteristic

## $E_{ON}$ vs $I_C$

$V_{GE} = +15/-8V, R_{Gon} = 4.7\Omega, R_{Goff} = 15\Omega, V_{CE} = 400V$

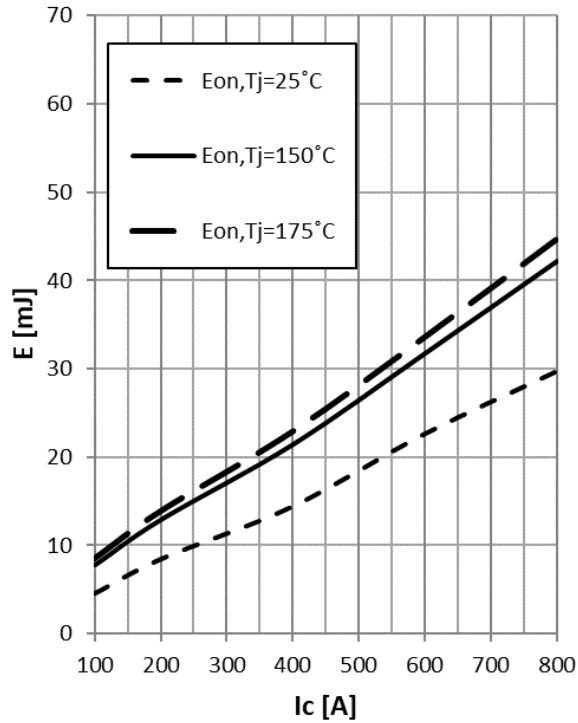


Figure 7.  $E_{ON}$  vs.  $I_C$

## $E_{ON}$ vs $R_g$

$V_{GE} = +15/-8V, I_C = 600A, V_{CE} = 400V$

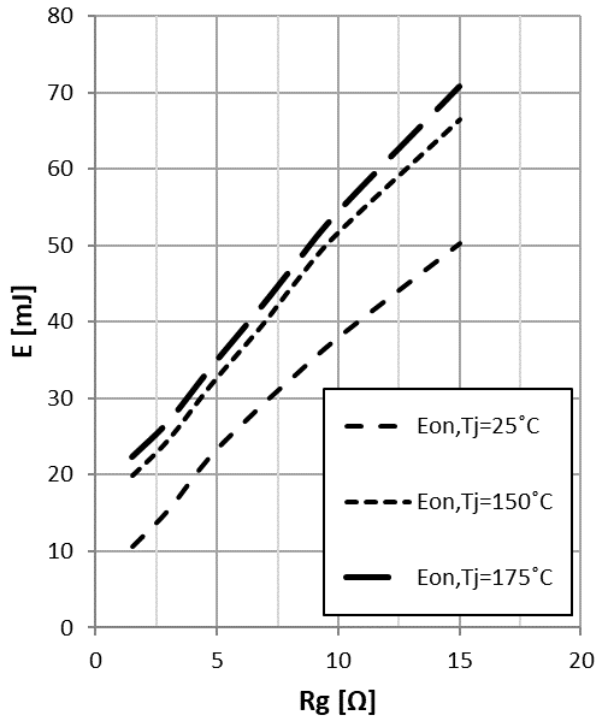


Figure 8.  $E_{ON}$  vs.  $R_g$

# VE-Trac™ Dual NVG800A75L4DSB

## E<sub>OFF</sub> vs I<sub>c</sub>

V<sub>GE</sub>=+15/-8V, R<sub>Gon</sub>= 4.7Ω, R<sub>Goff</sub>= 15Ω, V<sub>CE</sub>=400V

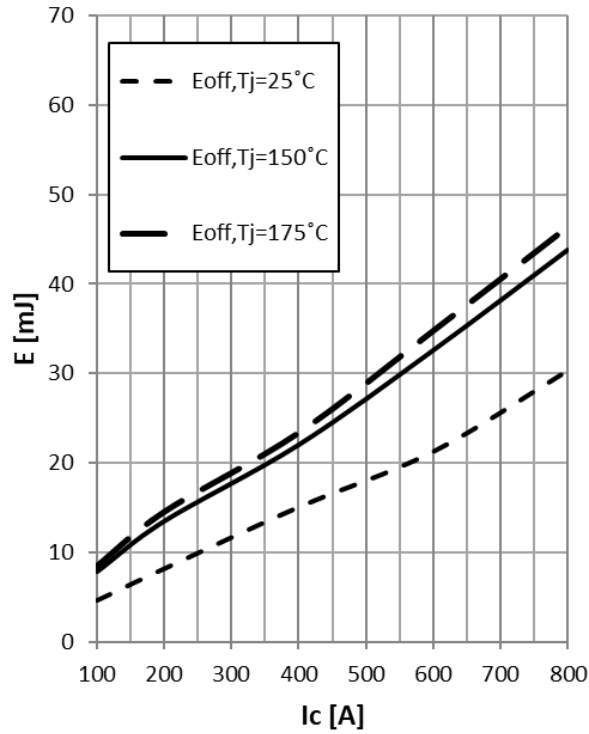


Figure 9. E<sub>OFF</sub> vs. I<sub>c</sub>

## E<sub>OFF</sub> vs R<sub>g</sub>

V<sub>GE</sub> = +15/-8V, I<sub>c</sub>=600A V<sub>CE</sub>=400V

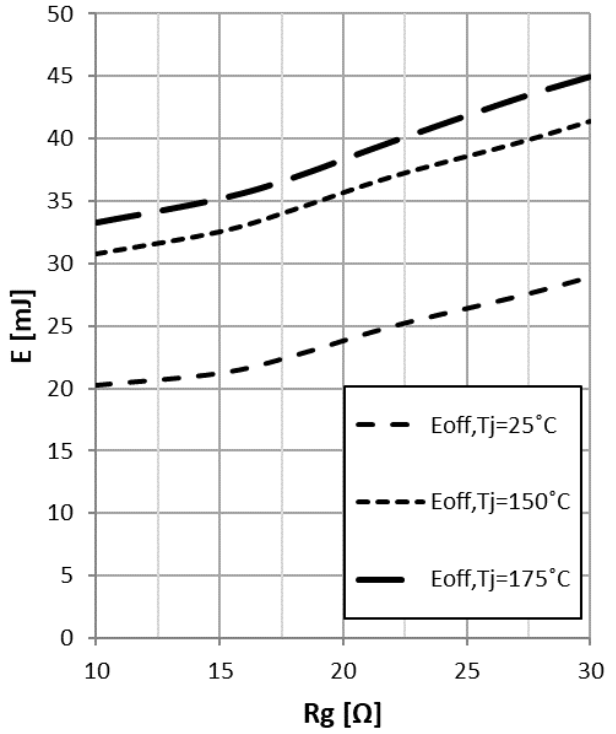


Figure 10. E<sub>OFF</sub> vs. R<sub>g</sub>

## IGBT Switching Times vs I<sub>c</sub>, T<sub>vj</sub> = 25°C

V<sub>GE</sub>=+15/-8V, R<sub>Gon</sub>= 4.7Ω, R<sub>Goff</sub>= 15Ω, V<sub>CE</sub>=400V

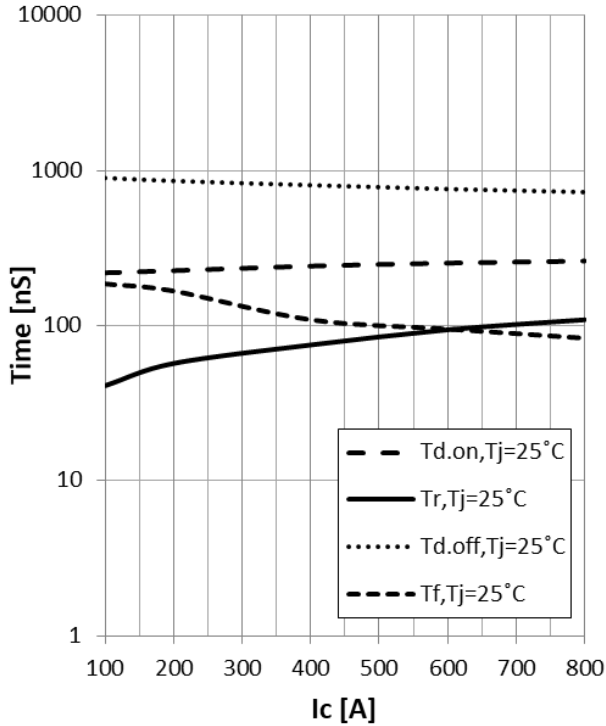


Figure 11. IGBT Switching Times vs I<sub>c</sub>, T<sub>vj</sub> = 25°C

## IGBT Switching Times vs I<sub>c</sub>, T<sub>vj</sub> = 175°C

V<sub>GE</sub>=+15/-8V, R<sub>Gon</sub>= 4.7Ω, R<sub>Goff</sub>= 15Ω, V<sub>CE</sub>=400V

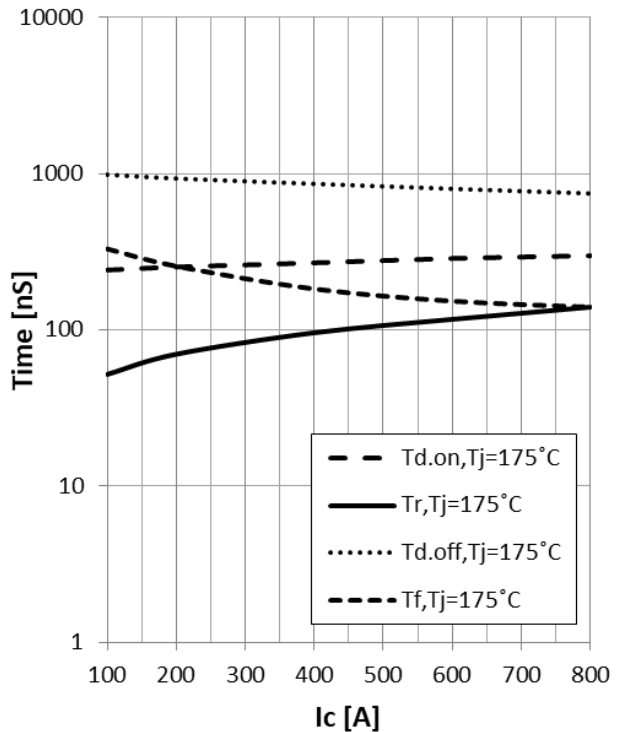


Figure 12. IGBT Switching Times vs I<sub>c</sub>, T<sub>vj</sub> = 175°C



**Reverse Bias Safe Operating Area**

$V_{GE} = +15/-8V$ ,  $R_{Goff} = 15\Omega$ ,  $T_{vj} = 175^{\circ}C$

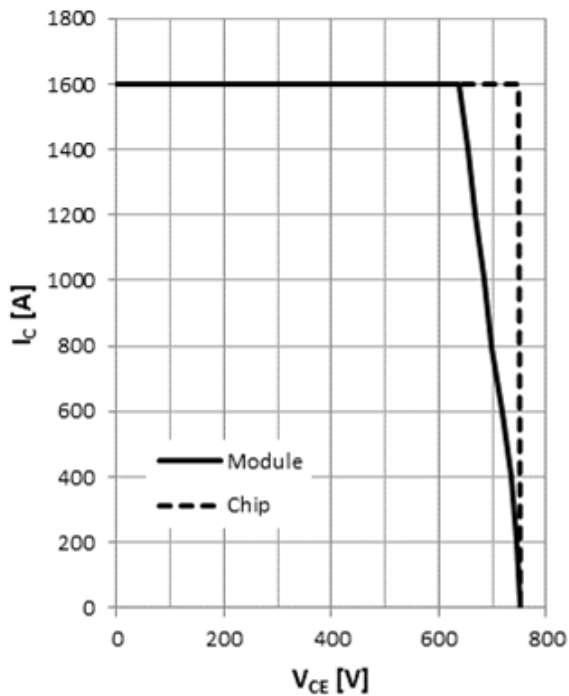


Figure 13. Reverse Bias Safe Operating Area

**IGBT Transient Thermal Impedance (typ)**

10L/min,  $T_f = 65^{\circ}C$ , 50/50 EGW, Ref. Heatsink

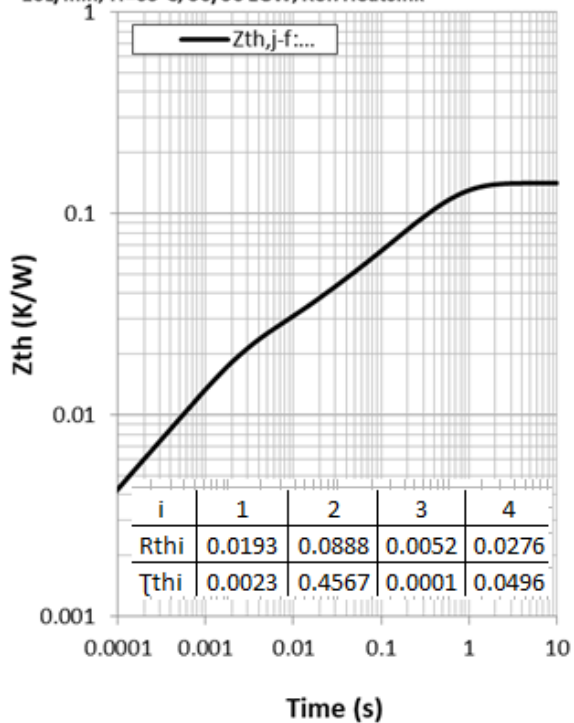


Figure 14. IGBT Transient Thermal Impedance

**Diode Forward Characteristic**

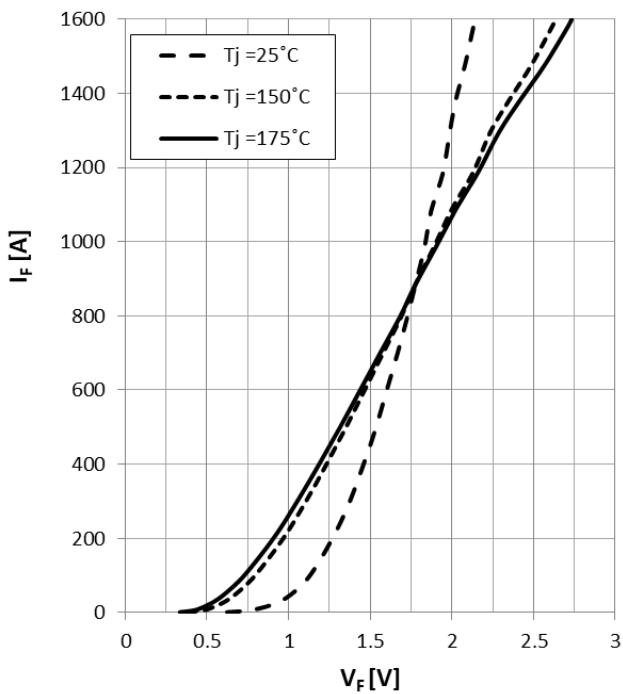


Figure 15. Diode Forward Characteristic

**Diode Switching losses vs  $I_F$**

$R_{Gon} = 4.7\Omega$ ,  $V_{CE} = 400V$

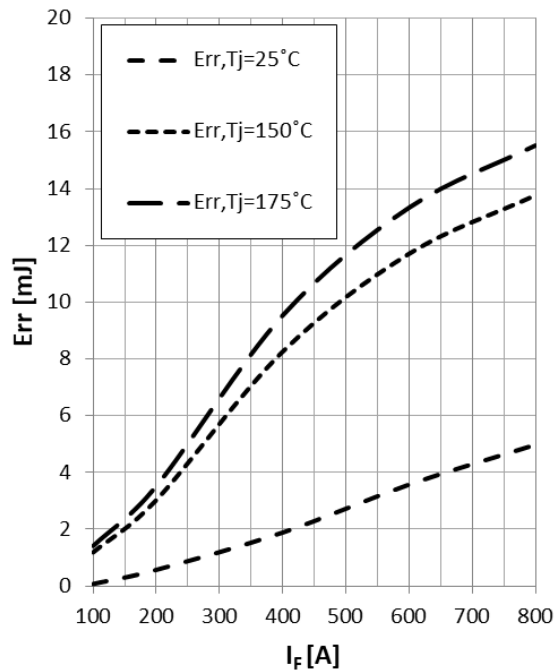


Figure 16. Diode Switching Losses vs.  $I_F$

Diode Switching losses vs Rg

$I_F=600A, V_{CE}=400V$

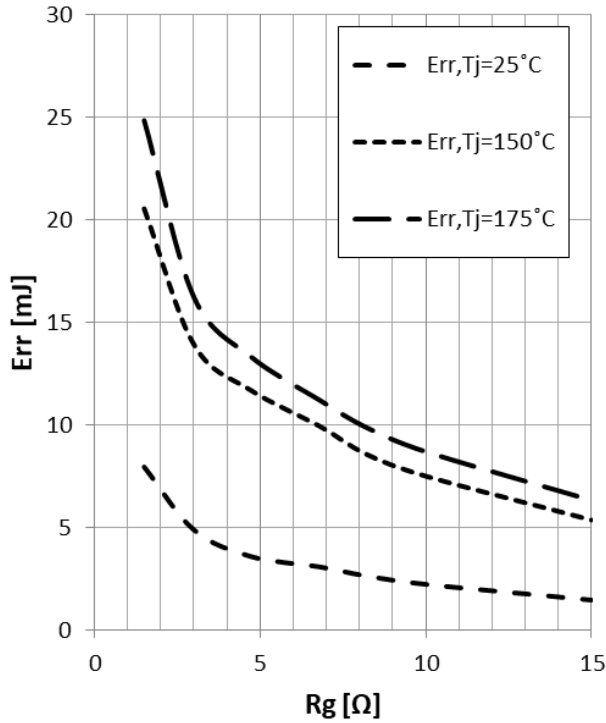


Figure 17. Diode Switching Losses vs. Rg

Diode Transient Thermal Impedance (typ)

10L/min, Tf=65°C, 50/50 EGW, Ref. Heatsink

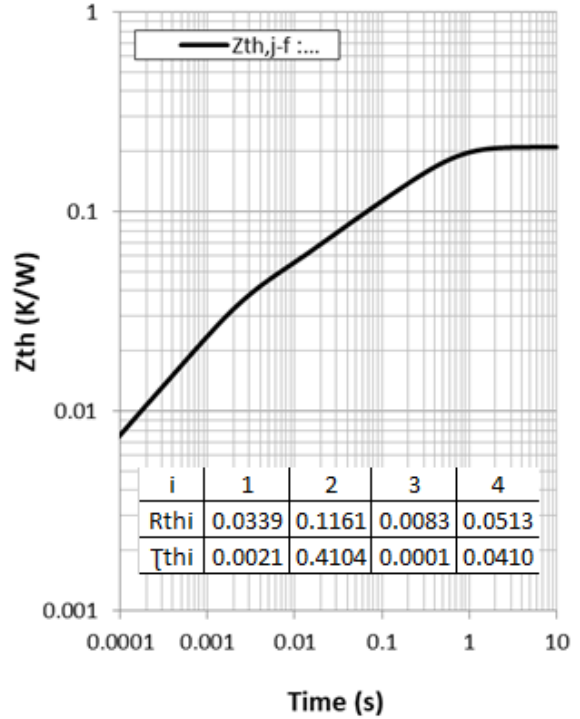


Figure 18. Diode Transient Thermal Impedance

Temperature Sensor Characteristic

$I_{bias} = 1mA$

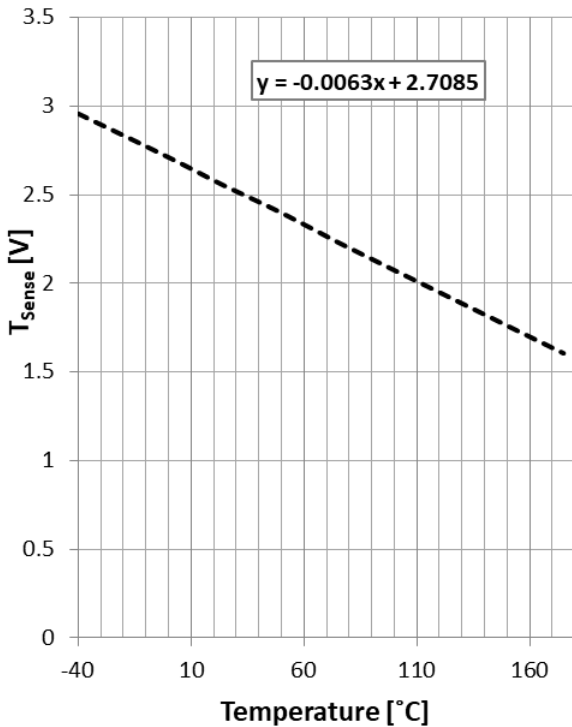


Figure 19. Temperature Sensor Characteristic

Current Sensor Characteristic

$R_{shunt} = 5 \Omega$

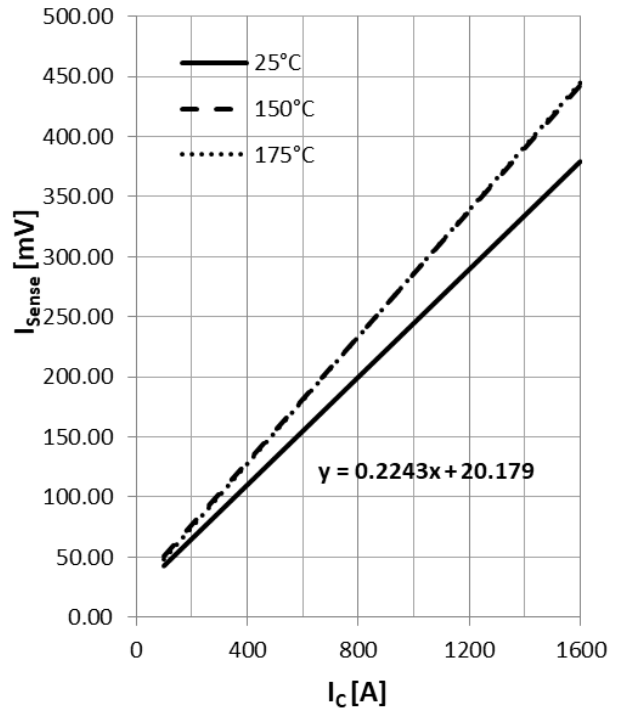


Figure 20. Current Sensor Characteristic

# VE-Trac™ Dual NVG800A75L4DSB

## Current Sensor Characteristic

$R_{shunt} = 20 \Omega$

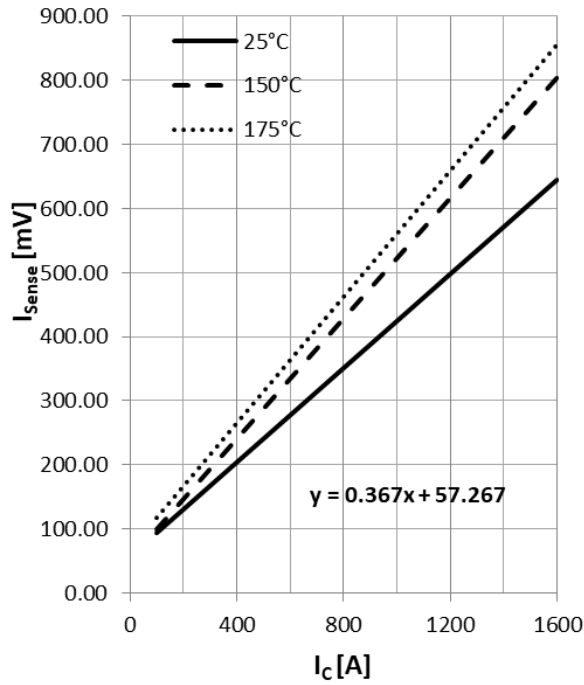
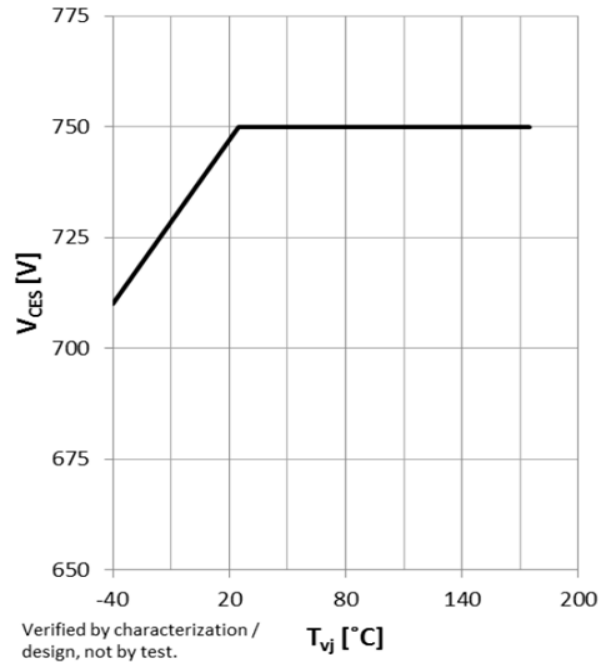


Figure 21. Current Sensor Characteristic

## Maximum allowed Vce

$I_{CES} = 1mA, T_{vj} \leq 25^\circ C; I_{CES} = 30mA, T_{vj} > 25^\circ C$



Verified by characterization / design, not by test.

Figure 22. Maximum Allowed  $V_{CE}$

## ORDERING INFORMATION

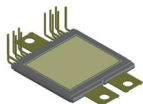
| Part Number    | Device Marking | Package    | Shipping       |
|----------------|----------------|------------|----------------|
| NVG800A75L4DSB | N875DSB        | AHPM15-CEC | 6 Units / Tube |

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# MECHANICAL CASE OUTLINE

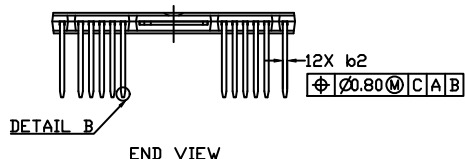
## PACKAGE DIMENSIONS

ON Semiconductor®

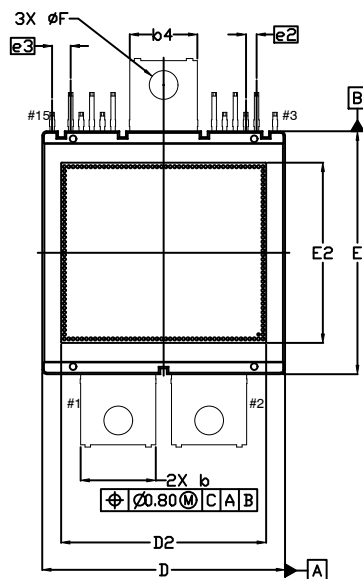


**AHPM15-CEC**  
CASE 100DV  
ISSUE O

DATE 05 MAY 2020



END VIEW



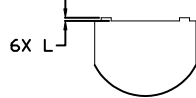
TOP VIEW



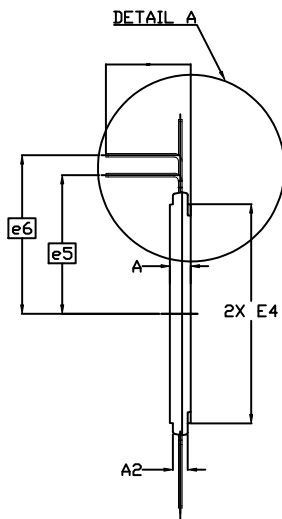
END VIEW



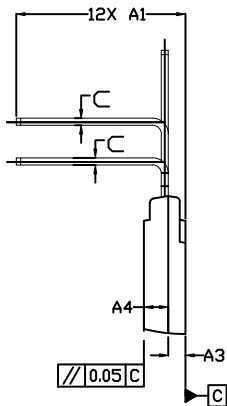
DETAIL B



DETAIL C

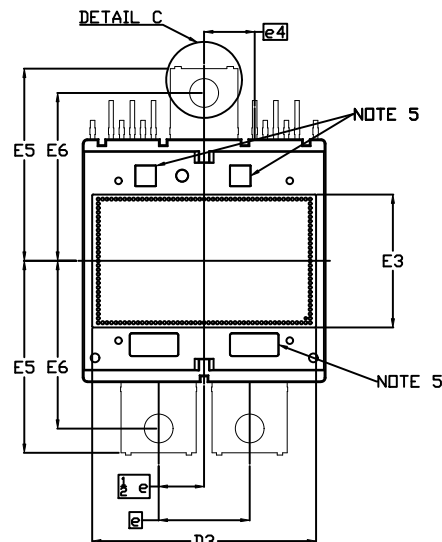


SIDE VIEW



DETAIL A

- NOTES:
1. DIMENSIONING AND TOLERANCING PER. ASME Y14.5M, 2009.
  2. CONTROLLING DIMENSION: MILLIMETERS
  3. DIMENSIONS D & E DO NOT INCLUDE MOLD PROTRUSIONS
  4. DIMENSIONS b, b2 DO NOT INCLUDE DAMBAR REMAIN.
  5. MARKING AREA.

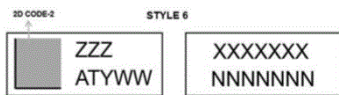


BOTTOM VIEW

| DIM | MILLIMETERS |       |       |
|-----|-------------|-------|-------|
|     | MIN.        | NOM.  | MAX.  |
| A   | 4.65        | 4.70  | 4.75  |
| A1  | 18.82       | 19.17 | 19.52 |
| A2  | 3.20        | 3.40  | 3.60  |
| A3  | 1.95 REF    |       |       |
| A4  | 2.75 REF    |       |       |
| b   | 16.90       | 17.00 | 17.10 |
| b2  | 0.90        | 1.00  | 1.10  |
| b3  | 0.50 REF    |       |       |
| b4  | 15.20       | 15.30 | 15.40 |
| c   | 0.70        | 0.80  | 0.90  |
| D   | 54.80       | 55.00 | 55.20 |
| D2  | 46.10       | 46.40 | 46.70 |
| D3  | 50.40       | 50.70 | 51.00 |
| E   | 54.80       | 55.00 | 55.20 |

| DIM | MILLIMETERS |       |       |
|-----|-------------|-------|-------|
|     | MIN.        | NOM.  | MAX.  |
| E2  | 40.50       | 40.80 | 41.10 |
| E3  | 29.80       | 30.10 | 30.40 |
| E4  | 49.40       | 49.60 | 49.80 |
| E5  | 43.35       | 43.70 | 44.05 |
| E6  | 37.70       | 38.00 | 38.30 |
| e   | 20.60 BSC   |       |       |
| e2  | 2.40 BSC    |       |       |
| e3  | 4.20 BSC    |       |       |
| e4  | 11.45 BSC   |       |       |
| e5  | 31.40 BSC   |       |       |
| e6  | 35.90 BSC   |       |       |
| F   | 6.45        | 6.50  | 6.55  |
| L   | 0.50 REF    |       |       |
| M   | 10* REF     |       |       |

### GENERIC MARKING DIAGRAM\*



ZZZ = Assembly Lot Code  
 AT = Assembly & Test Site Code  
 YWW = Year and Work Week Code  
 XXXXX = Specific Device Code  
 NNNNN = Serial Number

\*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.

|                         |                    |  |
|-------------------------|--------------------|--|
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