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AHPM13−CGA MODULE
CASE MODHR

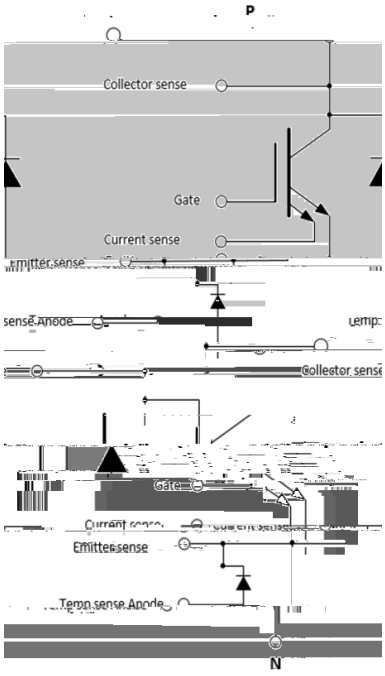
Product Description

Features

Typical Applications

MARKING DIAGRAM

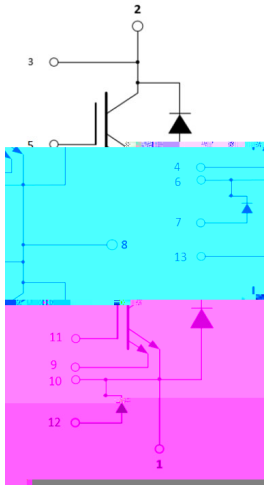
ZZZ = Assembly Lot Code
AT = Assembly & Test Location
Y = Year
WW = Work Week
XXXX = Specific Device Code



ORDERING INFORMATION

See detailed ordering and shipping information on page 10 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 GATE	High Side Gate	
6	H/S EMITTER SENSE	High Side Emitter Sense	
7	H/S TEMP SENSE (ANODE)	High Side Temp sense Diode Anode	
8	~	Phase Output	
9	L/S CURRENT SENSE	Low Side Current Sense	
10	L/S EMITTER SENSE	Low Side Emitter Sense	
11	L/S GATE	Low Side Gate	
12	L/S TEMP SENSE (ANODE)	Low Side Temp sense Diode Anode	
13	L/S COLLECTOR SENSE	Low Side Collector Sense	

DBC Substrate

Lead Frame

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Flammability Information

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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
CTI	Comparative Tracking Index		

VE−Trac™ Dual NVG500A75L4DSF2

CHARACTERISTICS OF IGBT (Tvj = 25 C, unless otherwise specified)

Parameters		Conditions	Min	Typ	Max	unit
V_{CESAT}	Collector to Emitter Saturation Voltage	V_{GE} = 15 V, I_C = 400 A, T_{vj} = 25 C T_{vj} = 150 C T_{vj} = 175 C V_{GE} = 15 V, I_C = 500 A, T_{vj} = 25 C T_{vj} = 150 C T_{vj} = 175 C	− − − − − −	1.32 1.37 1.39 1.39 1.51 1.55	1.45 − − − − −	V
I_{CES}	Collector to Emitter Leakage Current	V_{GE} = 0, V_{CE} = 750 V T_{vj} = 25 C T_{vj} = 175 C	− −	− 8	1 −	mA
I_{GES}	Gate – Emitter Leakage Current	V_{CE} = 0, V_{GE} = 20 V	−	−	400	nA
V_{th}	Threshold Voltage	V_{CE} = V_{GE}, I_C = 500 mA	4.5	5.6	6.5	V
Q_G	Total Gate Charge	V_{GE} = −8 to 15 V, V_{CE} = 400 V, I_C = 400 A	−	0.96	−	μC
R_{Gint}	Internal Gate Resistance		−	2	−	Ω
C_{ies}	Input Capacitance	V_{CE} = 30 V, V_{GE} = 0 V, f = 1 MHz	−	36	−	nF
C_{oes}	Output Capacitance	V_{CE} = 30 V, V_{GE} = 0 V, f = 1 MHz	−	0.7	−	nF
C_{res}	Reverse Transfer Capacitance	V_{CE} = 30 V, V_{GE} = 0 V, f = 1 MHz	−	0.09	−	nF
$T_{d.on}$	Turn On Delay, Inductive Load	I_C = 400 A, V_{CE} = 400 V T_{vj} = 25 C V_{GE} = +15/−8 V T_{vj} = 150 C Rg.on = 3.9 Ω T_{vj} = 175 C	− − −	168 192 197	− − −	ns
T_r	Rise Time, Inductive Load	I_C = 400 A, V_{CE} = 400 V T_{vj} = 25 C V_{GE} = +15/−8 V T_{vj} = 150 C Rg.on = 3.9 Ω T_{vj} = 175 C	− − −	67 82 86	− − −	ns
$T_{d.off}$	Turn Off Delay, Inductive Load	I_C = 400 A, V_{CE} = 400 V T_{vj} = 25 C V_{GE} = +15/−8 V T_{vj} = 150 C Rg.off = 15 Ω T_{vj} = 175 C	− − −	801 872 884	− − −	ns
T_f	Fall Time, Inductive Load	I_C = 400 A, V_{CE} = 400 V T_{vj} = 25 C V_{GE} = +15/−8 V T_{vj} = 150 C Rg.off = 15 Ω T_{vj} = 175 C	− − −	112 165 196	− − −	ns
E_{ON}	Turn−On Switching Loss (Including Diode Reverse Recovery Loss)	I_C = 400 A, V_{CE} = 400 V T_{vj} = 25 C V_{GE} = +15/−8 V T_{vj} = 150 C Rg.on = 3.9 Ω T_{vj} = 175 C Ls = 25 nH di/dt (T_{vj} = 25 C) = 5.04 A/ns di/dt (T_{vj} = 175 C) = 4.15 A/ns	− − −	10.49 16.20 17.84	− − −	mJ
E_{OFF}	Turn−Off SwitchingLoss	I_C = 400 A, V_{CE} = 400 V T_{vj} = 25 C V_{GE} = +15/−8 V T_{vj} = 150 C Rg.off = 15 Ω T_{vj} = 175 C Ls = 25 nH dv/dt (T_{vj}=25 C) = 3.0 V/ns dv/dt (T_{vj}=175 C) = 2.24 V/ns	− − −	14.52 23.31 23.88	− − −	mJ
Esc	Minimum Short Circuit Energy Withstand	V_{GE} 15 V, V_{CE} = 400 V T_{vj} = 25 C T_{vj} = 175 C	− 3.0	3.0 −	− −	J

VE−Trac™ Dual NVG500A75L4DSF2

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TYPICAL CHARACTERISTICS

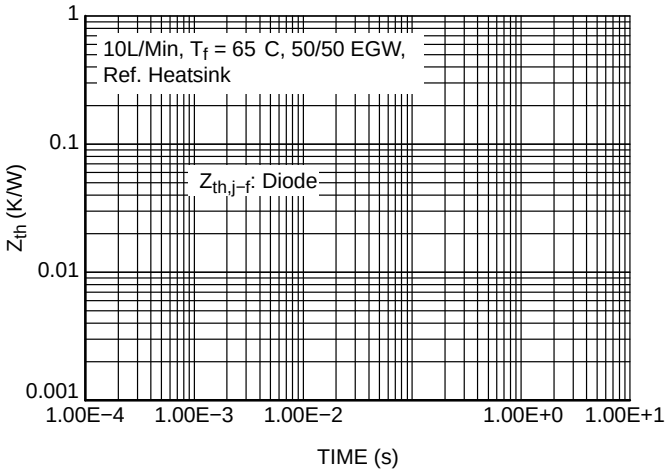

Figure 19. Diode Transient Thermal Impedance

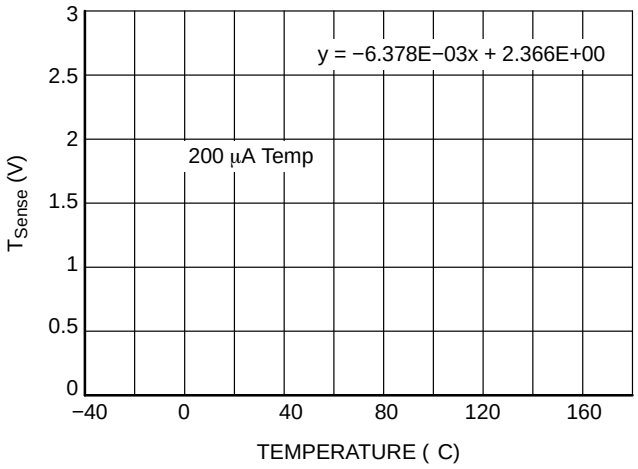

Figure 20. Temperature Sensor Characteristic

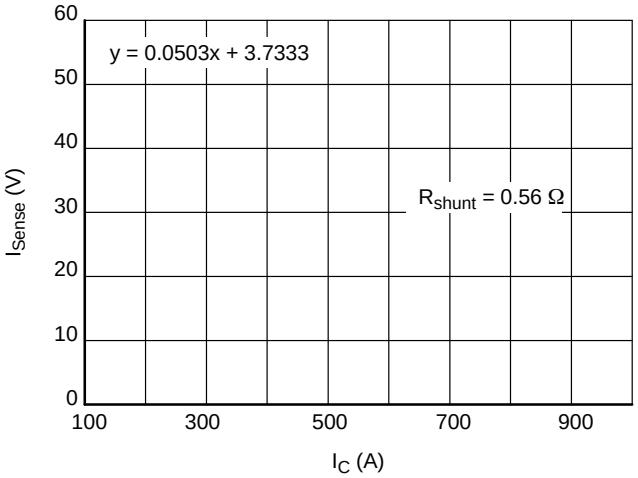

Figure 21. Current Sensor Characteristic

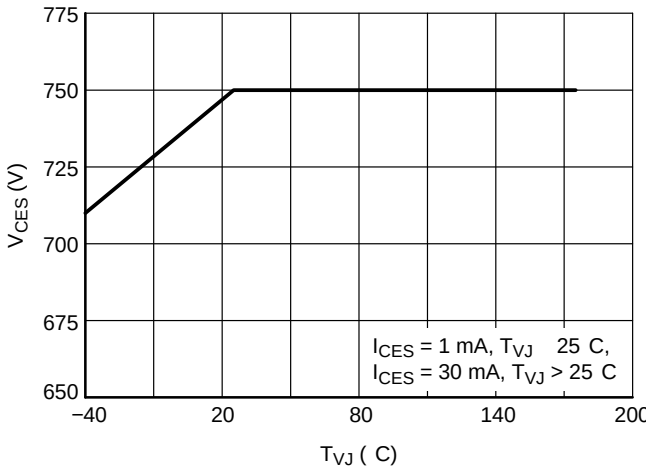

Figure 22. Maximum Allowed V_{CE}

ORDERING INFORMATION

Part Number	Package	Shipping
NVG500A75L4DSF2	AHPM13−CGA Module Case MODHR (Pb−Free)	36 Units / 2x Blister Tray

CASE MODHR
ISSUE B

DATE 19 MAY 2023

ZZZ = Assembly Lot Code
AT = Assembly & Test Location
Y = Year