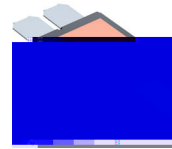


Product Description

Features

Typical Applications

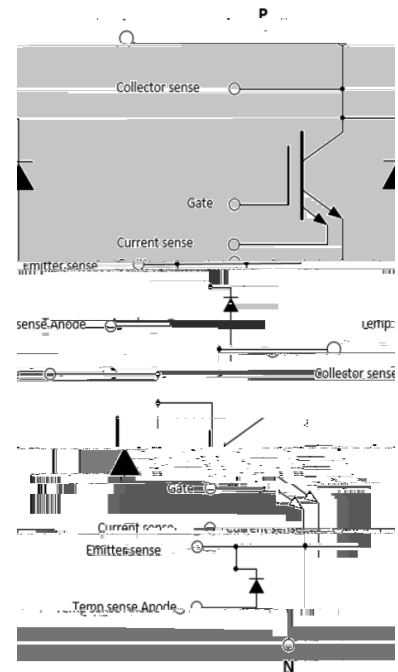


**AHPM13-CGA MODULE
 CASE MODHR**

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.

VE-Trac™ Dual NVG500A75L4DSF2

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

Flammability Information

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		

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VE-Trac™ Dual NVG500A75L4DSF2

CHARACTERISTICS OF IGBT ($T_{vj} = 25\text{ C}$, unless otherwise specified)

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

VE-Trac™ Dual NVG500A75L4DSF2



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TYPICAL CHARACTERISTICS

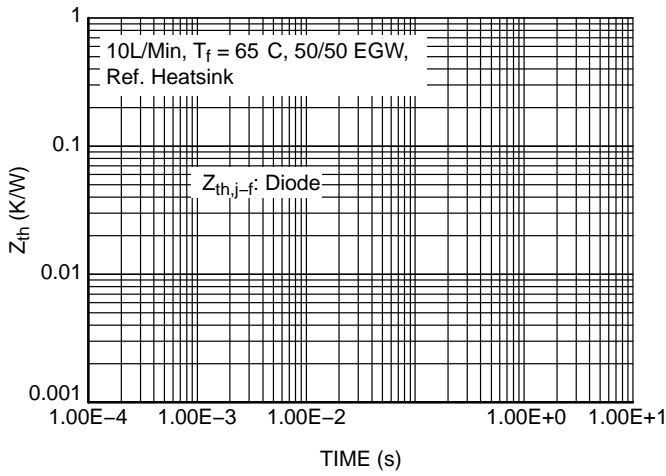


Figure 19. Diode Transient Thermal Impedance

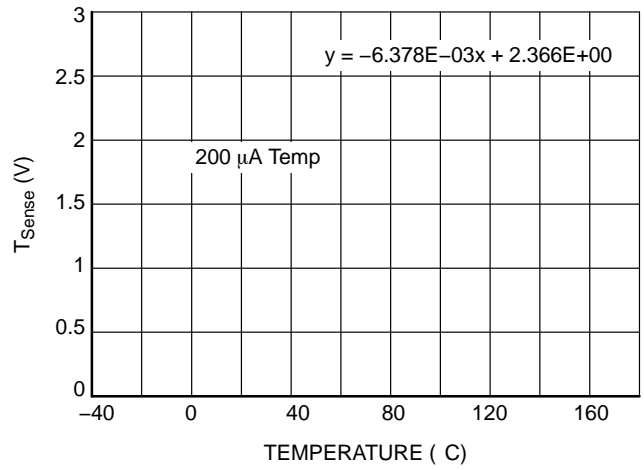


Figure 20. Temperature Sensor Characteristic

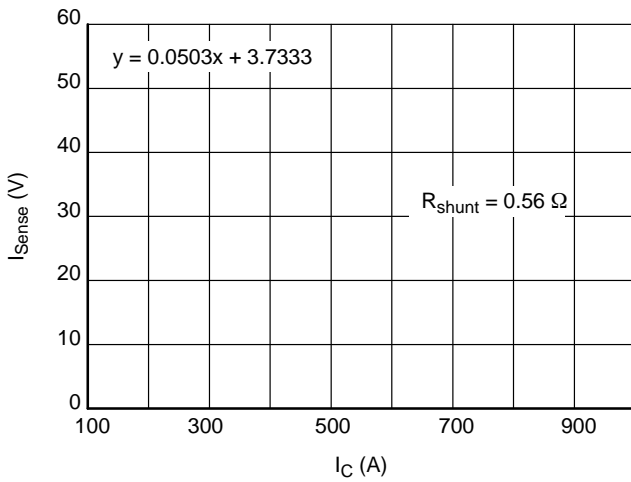


Figure 21. Current Sensor Characteristic

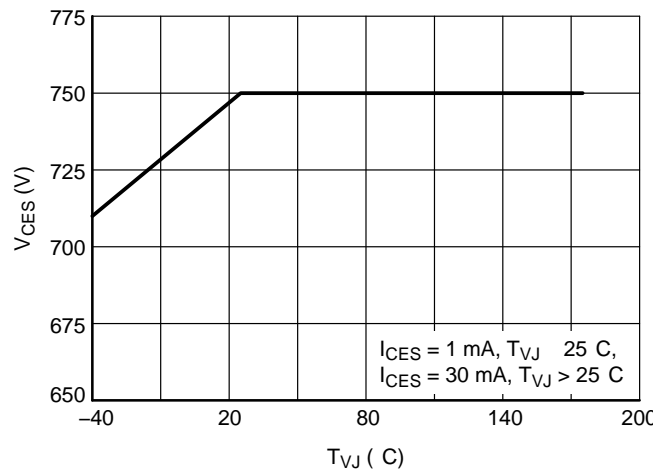


Figure 22. Maximum Allowed V_{CE}

VE-Trac™ Dual NVG500A75L4DSF2

ORDERING INFORMATION

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

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CASE MODHR
ISSUE B

DATE 19 MAY 2023

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

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