

$T_{jmax} = 175^{\circ}\text{C}$ Continuous Operation

- Low V_{CESAT} and Switching Losses
- Automotive Grade FS4 750 V Narrow Mesa IGBT
- Fast Recovery Diode Chip Technologies
- 4.2 kV Isolated DBC Substrate
- Easy to Integrate 6 pack Topology
- This Device is Pb Free and is RoHS Compliant

Typical Applications

- Hybrid and Electric Vehicle Traction Inverter Narrow Mesa IGBT

VE-Trac™ Direct Module NVH680S75L4SPB

Pin Description

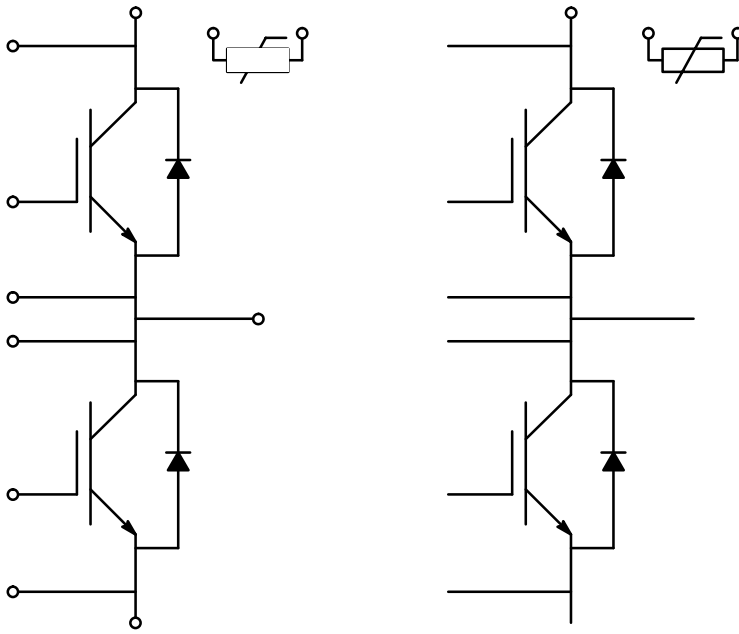


Figure 1. Pin Description

VE-Trac™ Direct Module NVH680S75L4SPB

MODULE CHARACTERISTICS (T_{vj} = 25°C, Unless Otherwise Specified)

Symbol	Parameter	Rating	Unit
T _{vj}	Operating Junction Temperature	-40 to 175	°C
T _{STG}	Storage Temperature	-40 to 125	°C
V _{ISO}	Isolation Voltage (DC, 0 Hz, 1 s)	4200	V
L _{sCE}	Stray Inductance	10	nH
RCC'+EE'	Module Lead Resistance, Terminals – Chip	0.75	mΩ
G	Module Weight	700	g
CTI	Comparative Tracking Index	>200	–
d _{creep}	Creepage: Terminal to Heatsink Terminal to Terminal	9.0 9.0	mm
d _{clear}	Clearance: Terminal to Heatsink Terminal to Terminal	4.5 4.5	mm

Symbol	Parameters	Conditions	Min	Typ	Max	Unit
Δp	Pressure Drop in Cooling Circuit	10 L/min, 65°C, 50/50 EGW	–	95	–	mbar
P (Note 1)	Maximum Pressure in Cooling Loop (relative)	T _{Baseplate} < 40°C T _{Baseplate} > 40°C	– –	– –	2.5	

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CHARACTERISTICS OF INVERSE DIODE (T_{vj} = 25°C, Unless Otherwise Specified)

Symbol	Parameters	Conditions	Min	Typ	Max	Unit	
V _F	Diode Forward Voltage (Terminal)	I _F = 500 A	T _{vj} = 25°C	–	1.60	1.85	V
	Diode Forward Voltage (Chip)	I _F = 500 A	T _{vj} = 25°C	–	1.53	1.78	
			T _{vj} = 150°C	–	1.45	–	
		I _F = 680 A	T _{vj} = 25°C	–	1.65	–	
			T _{vj} = 150°C	–	1.61	–	
			T _{vj} = 175°C	–	1.57	–	
E _{rr}	Reverse Recovery Energy	I _F = 500 A, V _R = 400 V, V _{GE} = +15/-8 V, R _{g,on} = 4.7 Ω	di/dt = 3.5 A/nS, T _{vj} = 25°C	–	3	–	mJ
			di/dt = 3.0 A/nS, T _{vj} = 150°C	–	8	–	
			di/dt = 2.8 A/nS, T _{vj} = 175°C	–	10	–	
Q _{RR}	Recovered Charge	I _F = 500 A, V _R = 400 V, V _{GE} = -8 V, R _{g,on} = 4.7 Ω	di/dt = 3.5 A/nS, T _{vj} = 25°C	–	11	–	μC
			di/dt = 3.0 A/nS, T _{vj} = 150°C	–	32	–	
			di/dt = 2.8 A/nS, T _{vj} = 175°C	–	38	–	
I _{rr}	Peak Reverse Recovery Current	I _F = 500 A, V _R = 400 V, V _{GE} = -8 V, R _{g,on} = 4.7 Ω	di/dt = 3.5 A/nS, T _{vj} = 25°C	–	141	–	A
			di/dt = 3.0 A/nS, T _{vj} = 150°C	–	247	–	
			di/dt = 2.8 A/nS, T _{vj} = 175°C	–	265	–	

NTC SENSOR CHARACTERISTICS (T_{vj} = 25°C, Unless Otherwise Specified)

Symbol	Parameters	Conditions	Min	Typ	Max	Unit
R ₂₅ (Note 3)	Rated Resistance	T _C = 25°C	–	5147	–	Ω
ΔR/R	Deviation of R ₁₀₅	T _C = 105°C, R ₁₀₅ = 472 Ω	5	–	5	%
P ₂₅	Power Dissipation	T _C = 25°C	–	–	32	mW
B _{25/55}	B-Value	R = R ₂₅ exp [B _{25/55} (1/T-1/298)]	–	3340	–	K
B _{25/85}	B-Value	R = R ₂₅ exp [B _{25/85} (1/T-1/298)]	–	3360	–	K
B _{25/105}	B-Value	R = R ₂₅ exp [B _{25/105} (1/T-1/298)]	–	3364	–	K

3. Measured value at terminals.

THERMAL CHARACTERISTICS

Symbol	Parameter	Min	Typ	Max	Unit
IGBT.R _{th,J-F}	R _{th} , Junction to Fluid, 10Tj6.5 0 0 6.5 132.831555 Tc(1/298))TjET226.998 291509 T59.754 29181 Tc0 Tw(25)Tj1.1164 .J6.56g(, Junction				

TYPICAL CHARACTERISTICS

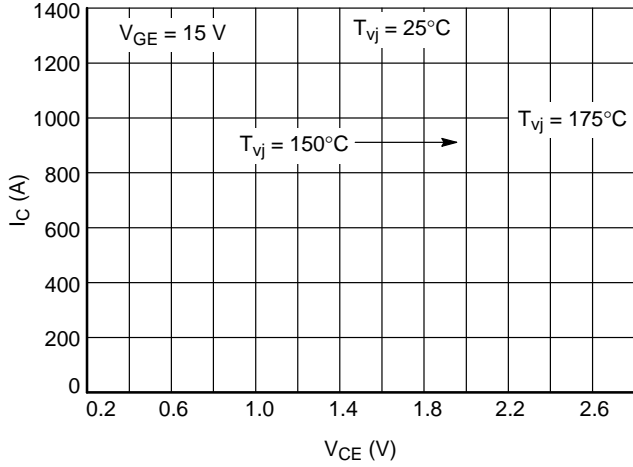


Figure 2. IGBT Output Characteristic

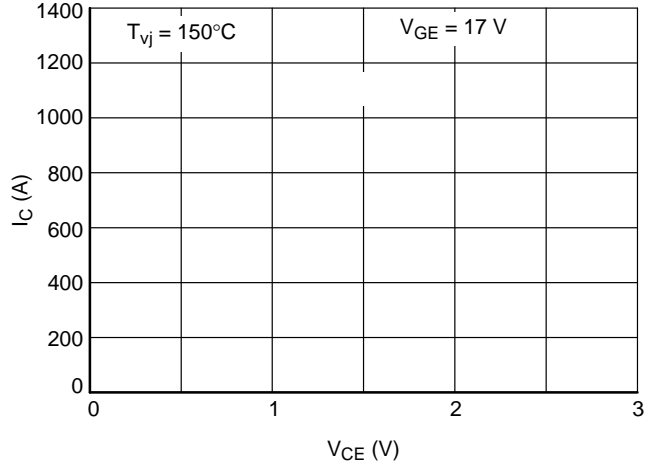


Figure 3. IGBT Output Characteristic

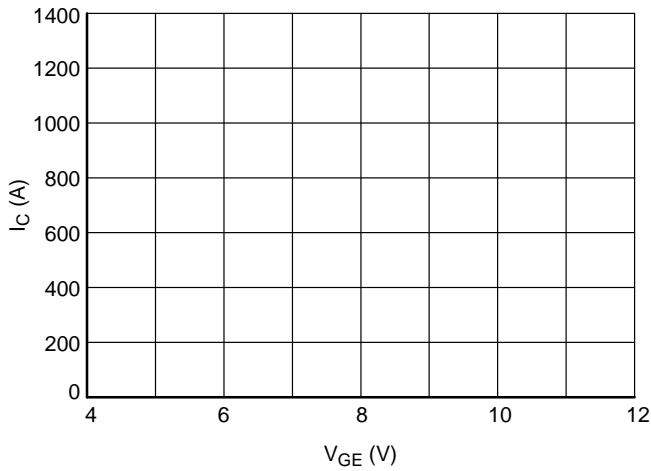


Figure 4. IGBT Transfer Characteristic

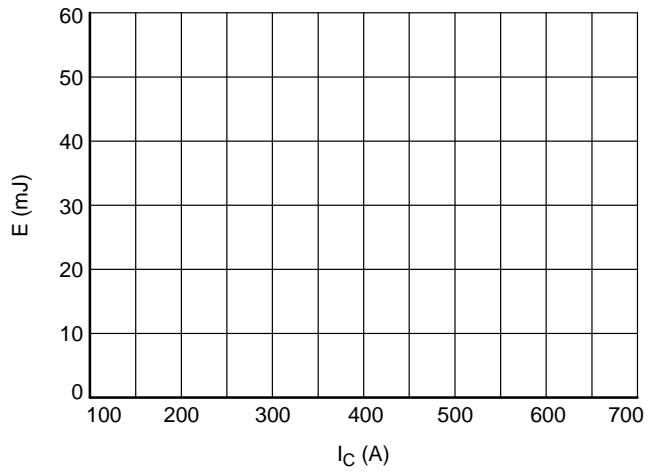


Figure 5. IGBT Turn-on Losses vs. I_C

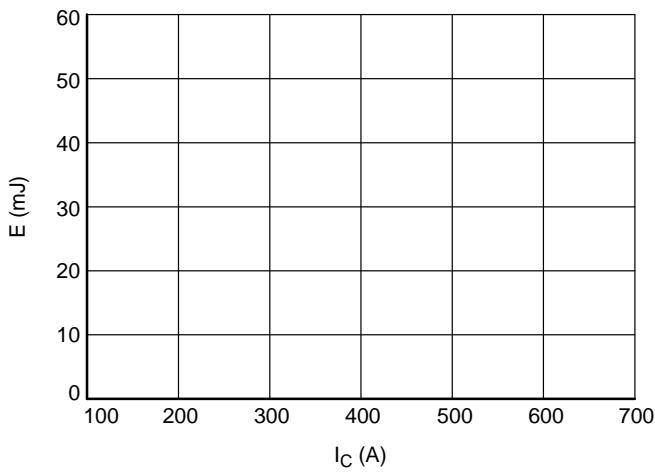


Figure 6. IGBT Turn-off Losses vs. I_C

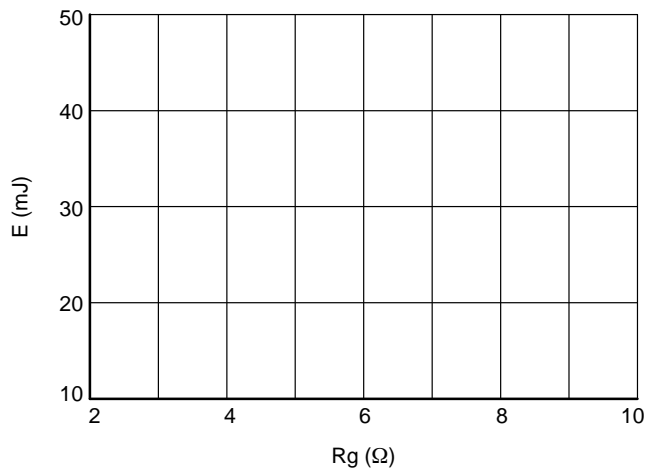


Figure 7. E_{on} vs. R_g

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TYPICAL CHARACTERISTICS

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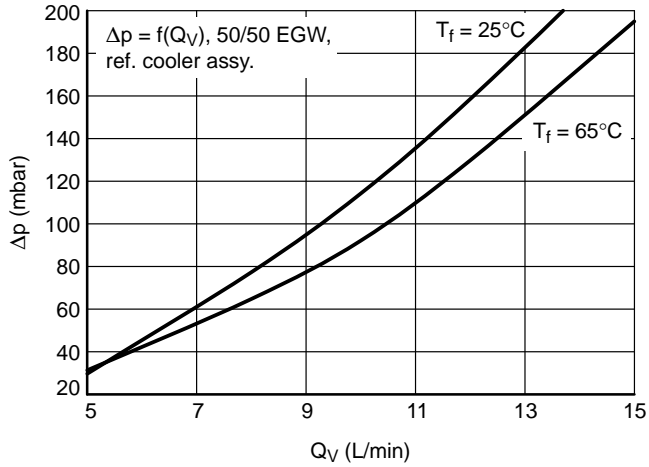


Figure 20. Pressure Drop In Cooling Circuit

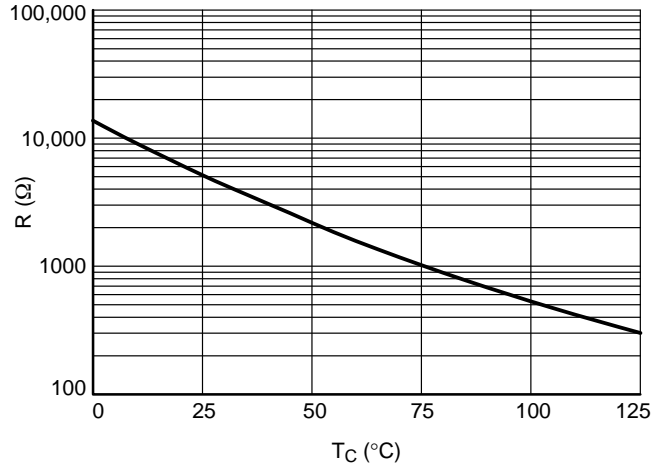


Figure 21. NTC Thermistor - Temperature Characteristic (Typical)

VE-Trac™ Direct Module NVH680S75L4SPB

PACKAGE DIMENSIONS


SSDC33, 154.50x92.0 (SPB)
CASE 183AB
ISSUE A

VE-Trac™ Direct Module NVH680S75L4SPB

PACKAGE DIMENSIONS

SSDC33, 154.50x92.0 (SPB)
CASE 183AB
ISSUE A

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