

VE-Trac™ Dual NVG800A75L4DSC

ABSOLUTE MAXIMUM RATINGS (T_{VJ} = 25°C, Unless Otherwise Specified)

Symbol	Parameter	Rating	Unit
IGBT			
V _{CES}	Collector to Emitter Voltage	750	V
V _{GES}	Gate to Emitter Voltage	±20	V
I _{CN}	Implemented Collector Current	800	A
I _{C nom}	Continuous DC Collector Current, T _{VJmax} = 175°C, T _F = 65°C, ref. heatsink	550 ⁽¹⁾	A
I _{CRM}	Pulsed Collector Current @ V _{GE} = 15 V, t _p = 1 ms	1600	A

Diode

V _{RRM}	Repetitive peak reverse voltage	750	V
I _{FN}	Implemented Forward Current	800	A
I _F	Continuous Forward Current, T _{VJmax} = 175°C, T _F = 65°C, ref. heatsink	420 ⁽¹⁾	A
I _{FRM}	Repetitive Peak Forward Current, t _p = 1 ms	1600	A
I ² t value	Surge current capability, V _R = 0 V, t _p = 10 ms, T _{VJ} = 150°C T _{VJ} = 175°C	20000 18000	A ² 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 _{th,J-C}	Effective Rth, Junction to Case ⁽²⁾		0.05	0.07	°C/W
IGBT.R _{th,J-F}	Effective Rth, Junction to Fluid, λ _{TIM} = 6 W/m-K, F = 660 N 10 L/min, 65°C, 50/50 EGW, Ref. Heatsink		0.14		°C/W
Diode.R _{th,J-C}	Effective Rth, Junction to Case ⁽²⁾		0.08	0.10	°C/W
Diode.R _{th,J-F}	Effective Rth, Junction to Fluid, λ _{TIM} = 6 W/m-K, F = 660 N 10 L/min, 65°C, 50/50 EGW, Ref. Heatsink		0.21		°C/W

2. For the measurement point of case temperature (T_c), 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 NVG800A75L4DSC

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

Parameters	Conditions	Min	Typ	Max	Unit
V _{CESAT}	Collector to Emitter Saturation Voltage (Terminal) V _{GE} = 15 V, I _C = 600 A, T _{vj} = 25°C T _{vj} = 150°C T _{vj} = 175°C V _{GE} = 15 V, I _C = 800 A, T _{vj} = 25°C T _{vj} = 150°C T _{vj} = 175°C	–	1.30 1.42 1.45 1.44 1.64 1.68	1.55	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 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	4.6	5.5	6.2	V
Q _G	Total Gate Charge V _{GE} = –8 to 15 V, V _{CE} = 400 V	–	1.9	–	μC
R _{Gint}	Internal gate resistance	–	2	–	Ω
C _{ies}	Input Capacitance V _{CE} = 30 V, V _{GE} = 0 V, f = 1 MHz	–	48	–	nF
C _{oes}	Output Capacitance V _{CE} = 30 V, V _{GE} = 0 V, f = 1 MHz	–	1.37	–	nF
C _{res}	Reverse Transfer Capacitance V _{CE} = 30 V, V _{GE} = 0 V, f = 1 MHz	–	0.15	–	nF
T _{d,on}	Turn on delay, inductive load I _C = 600 A, V _{CE} = 400 V T _{vj} = 25°C V _{GE} = +15/–8 V T _{vj} = 150°C R _{g,on} = 4.7 Ω T _{vj} = 175°C	–	253 283 287	–	ns
T _r	Rise time, inductive load I _C = 600 A, V _{CE} = 400 V T _{vj} = 25°C V _{GE} = +15/–8 V T _{vj} = 150°C R _{g,on} = 4.7 Ω T _{vj} = 175°C	–	94 112 117	–	ns
T _{d,off}	Turn off delay, inductive load I _C = 600 A, V _{CE} = 400 V T _{vj} = 25°C V _{GE} = +15/–8 V T _{vj} = 150°C R _{g,off} = 15 Ω T _{vj} = 175°C	–	760 790 800	–	ns
T _f	Fall time, inductive load I _C = 600 A, V _{CE} = 400 V T _{vj} = 25°C V _{GE} = +15/–8 V T _{vj} = 150°C R _{g,off} = 15 Ω T _{vj} = 175°C	–	95 140 153	–	ns
E _{ON}	Turn-On Switching Loss (including diode reverse recovery loss) I _C = 600 A, V _{CE} = 400 V, V _{GE} = +15/–8 V, L _s = 20 nH, R _{g,on} = 4,7 Ω di/dt (T _{vj} = 25°C) = 5.13 A/ns di/dt (T _{vj} = 175°C) = 4.11 A/ns T _{vj} = 25°C T _{vj} = 150°C T _{vj} = 175°C	–	22.41 33.30 36.35	–	mJ
E _{OFF}	Turn-Off Switching Loss I _C = 600 A, V _{CE} = 400 V, V _{GE} = +15/–8 V, L _s = 20 nH, R _{g,off} = 15 Ω dv/dt (T _{vj} = 25°C) = 2.81 V/ns dv/dt (T _{vj} = 175°C) = 2.11 V/ns T _{vj} = 25°C T _{vj} = 150°C T _{vj} = 175°C	–	27.22 37.19 39.09	–	mJ
E _{SC}	Minimum Short Circuit Energy Withstand V _{GE} = 15 V, V _{CC} = 400 V T _{vj} = 25°C T _{vj} = 175°C	5 7.5			J