

1. Product Features

1.1 Electrical features

- $V_{CES}=650V$
- $I_{C\ nom}=150A / I_{CRM}=300A$
- Low switching losses
- Low inductance
- Fast switching and short tail current
- Integrated NTC temperature sensor
- High power and thermal cycling capability

1.2 Mechanical features

- Al_2O_3 substrate with low thermal resistance
- Integrated NTC temperature sensor
- High power and thermal cycling capability

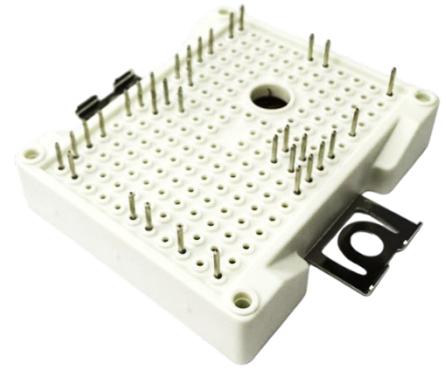


Figure 1 IGBT Module

2. Typical Applications

- 3-Level-Applications
- Solar Applications
- UPS Systems

3. Description

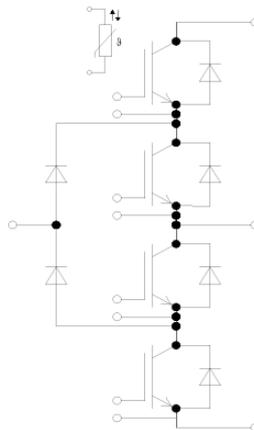


Figure 2 3 Level

4. IGBT, Inverter

4.1 Maximum rated values

Parameter	Note or test condition	Symbol	Values	Unit
Collector-emitter voltage 集电极—发射极间电压	$T_{vj} = 25^{\circ}\text{C}$	V_{CES}	650	V
Continuous DC collector current 连续集电极电流	$T_C = 100^{\circ}\text{C}, T_{vj\ max} = 150^{\circ}\text{C}$	$I_{C\ nom}$	150	A
Repetitive peak collector current 集电极峰值电流	$t_P = 1\ \text{ms}$	I_{CRM}	300	A
Total power dissipation 总功率损耗	$T_C = 25^{\circ}\text{C}, T_{vj\ max} = 175^{\circ}\text{C}$	P_{tot}	335	W
Gate-emitter peak voltage 栅极—发射极峰值电压		V_{GES}	+/- 20	V

4.2 Characteristic value

Parameter	Note or test condition	Symbol	Values			Unit
			Min.	Typ.	Max.	
Collector-emitter saturation voltage 集电极—发射极饱和电压	$I_C = 150\ \text{A}, V_{GE} = 15\ \text{V}$	$V_{CE, sat}$		$T_{vj} = 25^{\circ}\text{C}$	1.37	V
				$T_{vj} = 125^{\circ}\text{C}$	1.47	V
				$T_{vj} = 150^{\circ}\text{C}$	1.51	V
Gate threshold voltage 栅极阈值电压	$I_C = 1.5\ \text{mA}, V_{CE} = V_{GE}, T_{vj} = 25^{\circ}\text{C}$	$V_{GE, th}$		5.68		V
Collector-emitter cut-off current 集电极-发射极截止电流	$V_{CE} = 650\ \text{V}, V_{GE} = 0\ \text{V}, T_{vj} = 25^{\circ}\text{C}$	I_{CES}			1	mA
Gate-emitter leakage current 栅极-发射极漏电流	$V_{CE} = 0\ \text{V}, V_{GE} = 20\ \text{V}, T_{vj} = 25^{\circ}\text{C}$	I_{GES}			400	nA
Turn-on delay time, inductive load 开通延迟时间	$I_C = 150\ \text{A}, V_{CE} = 300\ \text{V}$ $V_{GE} = +15/-15\ \text{V}$ $R_{G, on} = 20\ \Omega$	$t_{d, on}$		$T_{vj} = 150^{\circ}\text{C}$	0.19	us
Rise time, inductive load 上升时间	$I_C = 150\ \text{A}, V_{CE} = 300\ \text{V}$ $V_{GE} = +15/-15\ \text{V}$ $R_{G, on} = 20\ \Omega$					

(table continues...) 待续

Parameter	Note or test condition		Symbol	Values			Unit
				Min.	Typ.	Max.	
Turn-off delay time, inductive load 关断延迟时间	$I_C = 150A, V_{CE} = 300V$ $V_{GE} = +15/-15V$ $R_{G,off} = 20\Omega$	$T_{vj} = 150^\circ C$	$t_{d,off}$		0.19		us
Fall time, inductive load 下降时间	$I_C = 150A, V_{CE} = 300V$ $V_{GE} = +15/-15V$ $R_{G,off} = 20\Omega$	$T_{vj} = 150^\circ C$	t_f		0.19		us
Turn-on energy loss per pulse 开通损耗能量	$I_C = 150A, V_{CE} = 300V$ $V_{GE} = +15/-15V, di/dt = 1350A/\mu s$ $R_{G,on} = 20\Omega (T_{vj} = 150^\circ C)$	$T_{vj} = 150^\circ C$	E_{on}		8.93		mJ
Turn-off energy loss per pulse 关断损耗能量	$I_C = 150A, V_{CE} = 300V$ $V_{GE} = +15/-15V, dv/dt = 3100V/\mu s$ $R_{G,off} = 20\Omega (T_{vj} = 150^\circ C)$	$T_{vj} = 150^\circ C$	E_{off}		5.98		mJ

5. Diode, Inverter

5.1 Maximum rated values

Parameter	Note or test condition	Symbol	Values	Unit
Repetitive peak reverse voltage 反向重复峰值电压	$T_{vj} = 25^\circ C$	V_{RRM}	650	V
Continuous DC forward current 连续正向直流电流		I_F	150	A
Repetitive peak forward current 正向重复峰值电流	$t_P = 1\text{ ms}$	I_{FRM}	300	A

5.2 Characteristic value

Parameter	Note or test condition		Symbol	Values			Unit
				Min.	Typ.	Max.	
Forward voltage 正向电压	$I_F = 150\text{ A}, V_{GE} = 0\text{ V}$	$T_{vj} = 25^\circ C$	V_F		1.63		V
		$T_{vj} = 125^\circ C$			1.38		V
		$T_{vj} = 150^\circ C$			1.32		V

(table continues...) 待续

Parameter	Note or test condition		Symbol	Values			Unit
				Min.	Typ.	Max.	
Peak reverse recovery current 反向恢复峰值电流	$I_F = 150A, V_R = 300V$ $V_{GE} = -15V, -di_F/dt = 1500 A/\mu s$ ($T_{vj}=150^\circ C$)	$T_{vj} = 150^\circ C$	I_{RM}		110		A
Recovered charge 恢复电荷	$I_F = 150A, V_R = 300V$ $V_{GE} = -15V, -di_F/dt = 1500 A/\mu s$ ($T_{vj}=150^\circ C$)	$T_{vj} = 150^\circ C$	Q_r		3.92		μC
Reverse recovery energy 反向恢复损耗 (每脉冲)	$I_F = 150A, V_R = 300V$ $V_{GE} = -15V, -di_F/dt = 1500 A/\mu s$ ($T_{vj}=150^\circ C$)	$T_{vj} = 150^\circ C$	E_{rec}		1.9		mJ

6. Diode, D5-D6

6.1 Maximum rated values

Parameter	Note or test condition	Symbol	Values	Unit
Repetitive peak reverse voltage 反向重复峰值电压	$T_{vj} = 25^\circ C$	V_{RRM}	650	V
Continuous DC forward current 连续正向直流电流		I_F	150	A
Repetitive peak forward current 正向重复峰值电流	$t_P = 1 ms$	I_{FRM}	300	A

6.2 Characteristic value

Parameter	Note or test condition		Symbol	Values			Unit
				Min.	Typ.	Max.	
Forward voltage 正向电压	$I_F = 150 A, V_{GE} = 0 V$	$T_{vj} = 25^\circ C$	V_F		1.63		V
		$T_{vj} = 125^\circ C$			1.38		V
		$T_{vj} = 150^\circ C$			1.32		V

(table continues...) 待续

Parameter	Note or test condition	Symbol	Values			Unit
			Min.	Typ.	Max.	
Peak reverse recovery current 反向恢复峰值电流	$I_F = 150A, V_R = 300V$ $V_{GE} = -15V, -di_F/dt = 1500 A/\mu s$ ($T_{vj}=150^\circ C$)	$T_{vj} = 150^\circ C$ I_{RM}		110		A
Recovered charge 恢复电荷	$I_F = 150A, V_R = 300V$ $V_{GE} = -15V, -di_F/dt = 1500 A/\mu s$ ($T_{vj}=150^\circ C$)	$T_{vj} = 150^\circ C$ Q_r		3.92		μC
Reverse recovery energy 反向恢复损耗 (每脉冲)	$I_F = 150A, V_R = 300V$ $V_{GE} = -15V, -di_F/dt = 1500 A/\mu s$ ($T_{vj}=150^\circ C$)	$T_{vj} = 150^\circ C$ E_{rec}		1.9		mJ

7. NTC-Thermistor

7.1 Characteristic value

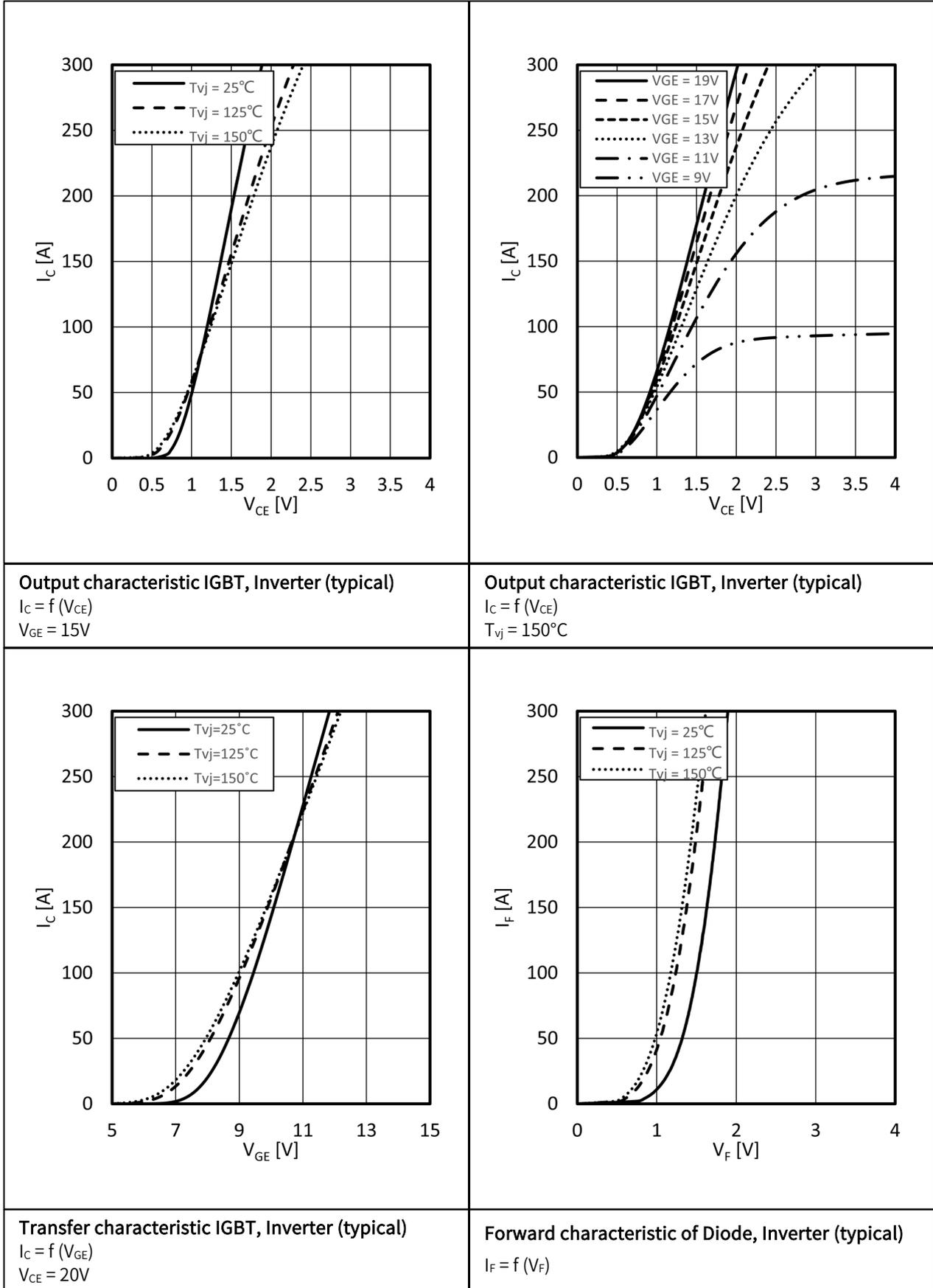
Parameter	Note or test condition	Symbol	Values			Unit
			Min.	Typ.	Max.	
Rated resistance 额定电阻值	$T_c = 25^\circ C$	R_{25}		5.00		$K\Omega$
Power dissipation 耗散功耗	$T_c = 25^\circ C$	P_{25}			24	mW
B-value B-Z 值	$R_2=R_{25}\exp[B_{25/50}(1/T_2-1/(298, 15K))]$	B_{25}/B_{50}		3400		K
B-value B-Z 值	$R_2=R_{25}\exp[B_{25/75}(1/T_2-1/(298, 15K))]$	B_{25}/B_{75}		3430		K
B-value B-Z 值	$R_2=R_{25}\exp[B_{25/100}(1/T_2-1/(298, 15K))]$	B_{25}/B_{100}		3445		K

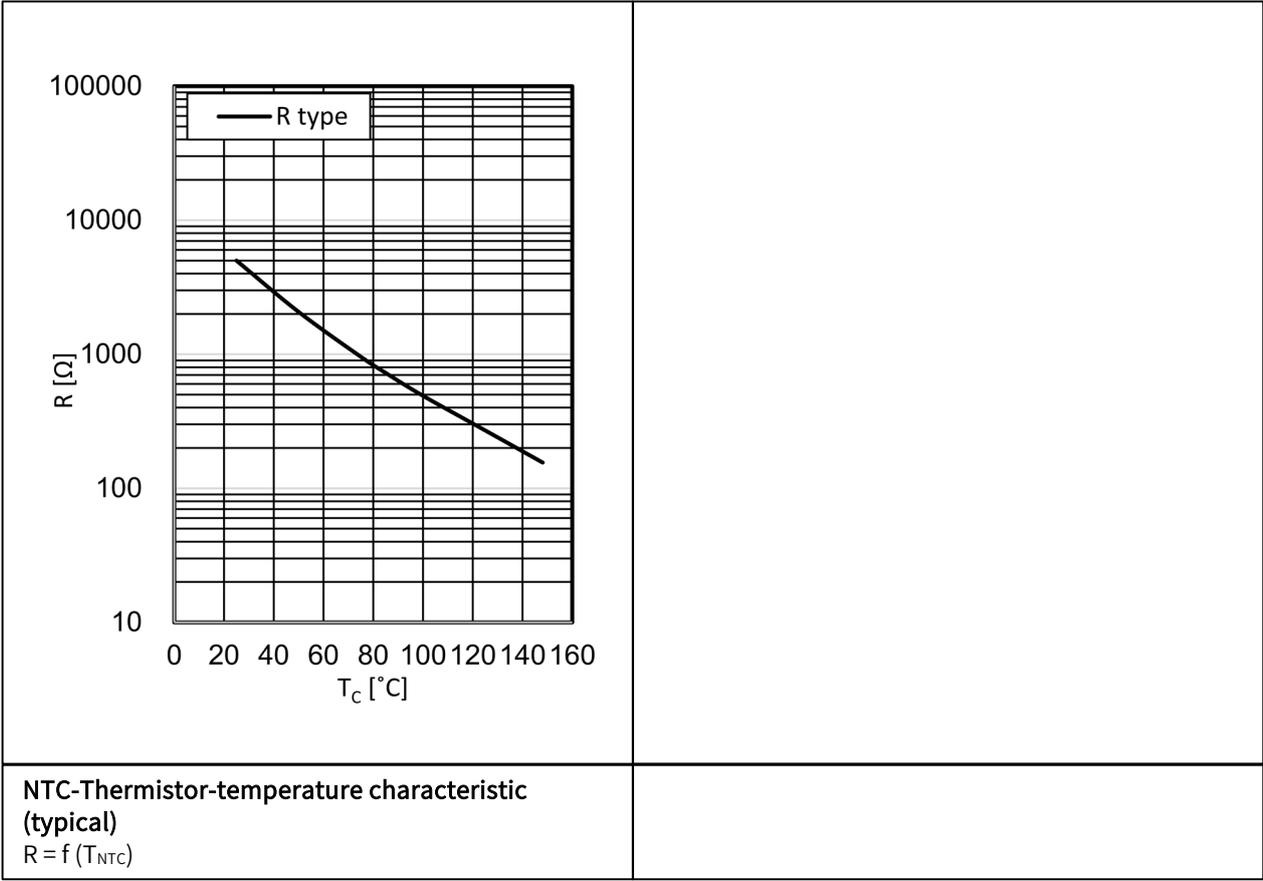
8. Module

8.1 Characteristic value

Parameter	Note or test condition	Symbol	Values			Unit
			Min.	Typ.	Max.	
Isolation Voltage 隔离电压	RMS, f=50HZ,1min	V _{ISOL}			2500	V
Stray inductance module 杂散电感		L _{SCE}		30		nH
Operation Junction Temperature 结温		T _{jop}	-40		150	°C
Storage Temperature Range 存储温度范围		T _{stg}	-40		125	°C
Mounting Torque 安装扭矩	Screw M5	M	2		2.3	N.m
Weight of Module 重量		G		24		g

9. Characteristics diagrams





10. Circuit Diagram

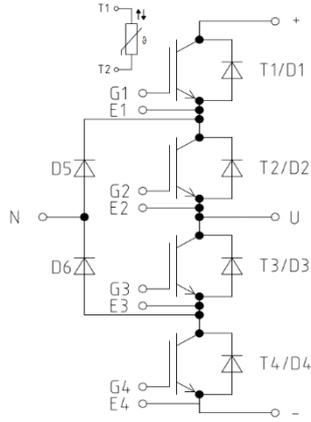


Figure 3

11. Package Outlines

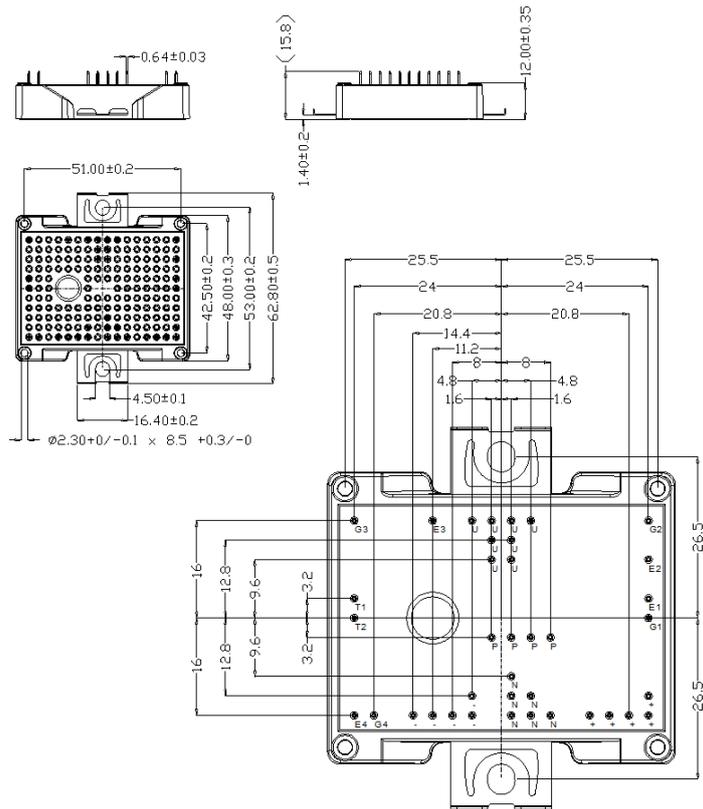


Figure 4