Discrete With with Trench Gate/Field Stop IGBT and NTC.

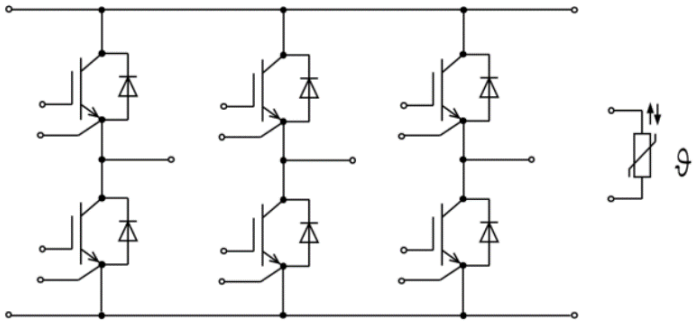
Features

- V_{CE}=1200V I_C=200A
- Low $V_{CE(sat)}$ with Positive Temperature Coefficient
- Trench+ Field Stop Technology

Applications

- Motor Drives
- Servo Drives

Equivalent Circuit Schematic



IGBT - Inverter

Maximum Rated Values

Symbol	Description	Conditions	Values	Unit
V_{CES}	Collector-Emitter Voltage	T_{vj}=25℃	1200	V
V_{GES}	Gate-Emitter Peak Voltage	T_{vj}=25℃	±30	V
I_C	Continuous DC Collector Current	T_C=100℃	200	A
I_{CRM}	Repetitive Peak Collector Current	t_P=1ms	400	A
P_{tot}	Total Power Dissipation	T_C=25℃, $T_{vj\ max}$=150℃	950	W

Characteristic Values

Symbol	Description	Conditions	Values			Unit
			Min.	Typ.	Max.	
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	V_{GE}=15V, I_C=200A, T_{vj}=25℃	---	1.8	2.3	V
		V_{GE}=15V, I_C=200A, T_{vj}=125℃	---	2.0	2.5	V
$V_{GE(th)}$	Gate Threshold Voltage	V_{GE}=V_{CE}, I_C=5.0mA	5.0	5.8	7.0	V
I_{CES}	Collector-Emitter Cut-Off Current	V_{CE}=1200V, V_{GE}=0V	---	---	3.0	mA
I_{GES}	Gate-Emitter Leakage Current	V_{GE}=15V, V_{CE}=0V	---	---	400	nA
$t_{d(on)}$	Turn-on Delay Time	V_{CC}=600V V_{GE}=±15V I_C=200A R_G=2.0Ω Inductive Load T_{vj}=25℃	---	159	---	ns
t_r	Turn-on Rise Time		---	64	---	ns
$t_{d(off)}$	Turn-off Delay Time		---	361	---	ns
t_f	Turn-off Fall Time		---	107	---	ns
E_{on}	Turn-on Switching Loss		---	13.1	---	mJ
E_{off}	Turn-off Switching Loss		---	14.5	---	mJ
I_{SC}	Short Circuit data	V_{GE}=15V, V_{CC}=600V t_P=10μs, T_{vj}=125°C	---	1100	---	A
R_{thJC}	Thermal Resistance, Junction to Case	Per IGBT	---	---	0.13	K/W
$T_{VJ\ OP}$	Virtual Junction Temperature	Under Switching	-40	---	125	℃

Diode - Inverter

Maximum Rated Values

Symbol	Description	Conditions	Values	Unit
V_{RRM}	Repetitive Peak Reverse Voltage	T_{vj}=25℃	1200	V
I_F	Continuous DC Forward Current	T_C=100℃	200	A
I_{FRM}	Repetitive Peak Collector Current	t_P=1ms	400	A

Characteristic Values

Symbol	Description	Conditions	Values			Unit
			Min.	Typ.	Max.	
V_F	Forward Voltage	I_F=200A, V_{GE}=0V, T_{vj}=25℃	---	1.85	2.5	V
		I_F=200A, V_{GE}=0V, T_{vj}=125℃	---	2.0	---	V
I_{RM}	Peak Reverse Recovery Current	I_F=200A, V_R=600V -di/dt=1350 A/us T_{vj}=25℃	---	144	---	ns
Q_r	Recovered Charge		---	18.4	---	uC
E_{rec}	Reverse Recovery Energy		---	9.8	---	mJ
$T_{VJ\ OP}$	Virtual Junction Temperature	Under Switching	-40	---	125	℃

NTC-Thermistor

Characteristic Values

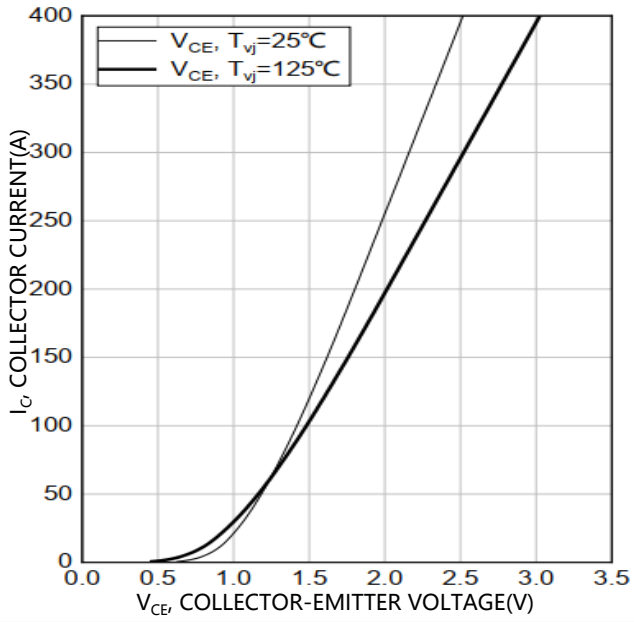
Symbol	Description	Conditions	Values			Unit
			Min.	Typ.	Max.	
R_{25}	Rated Resistance	T_C=25℃	---	5	---	KΩ
$B_{25/50}$	B Value	$R_2 = R_{25} \exp [B_{25/50}(1/T_2 - 1/(298\ K))]$	---	3380	---	K

Module

Symbol	Description	Conditions	Values			Unit
			Min.	Typ.	Max.	
V_{ISOL}	Isolation Test Voltage	RMS, f=50Hz, t=1min	2.5	---	---	KV
T_{stg}	Storage Temperature		-40	---	125	℃
M	Mounting torque for module mounting		3.00	---	6.00	Nm
G	Weight		---	300	---	g

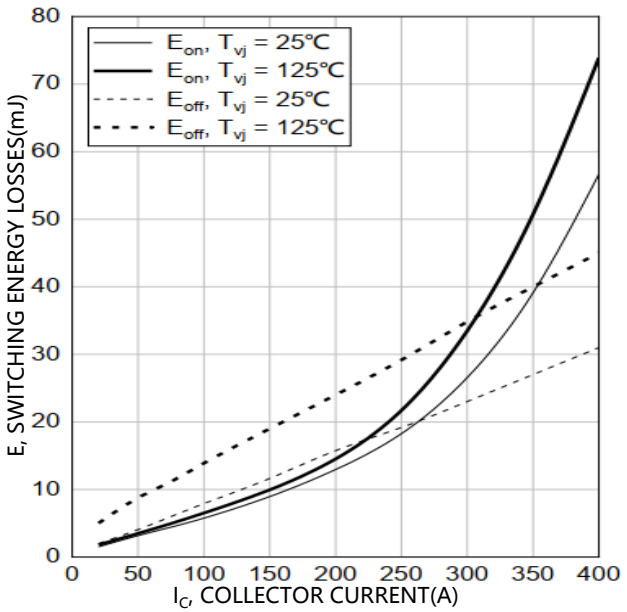
Typical Characteristics

Fig. 1



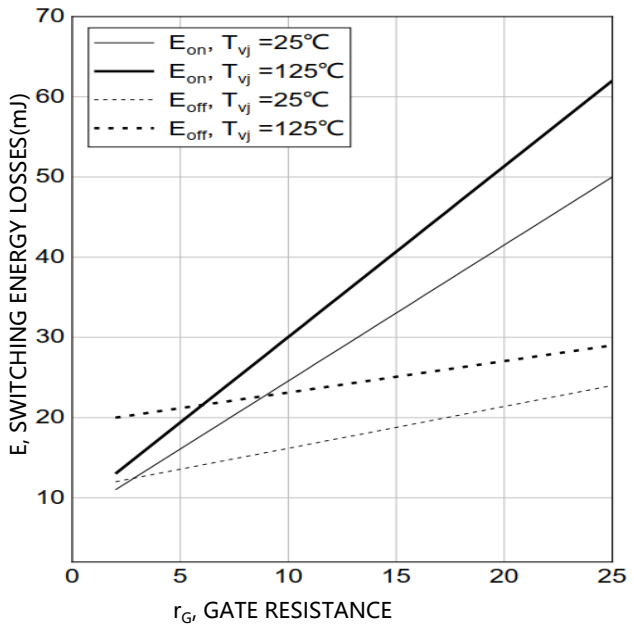
Output characteristic IGBT-Inverter (typical)
$I_C=f(V_{CE})$ at V_{GE}=15V

Fig. 2



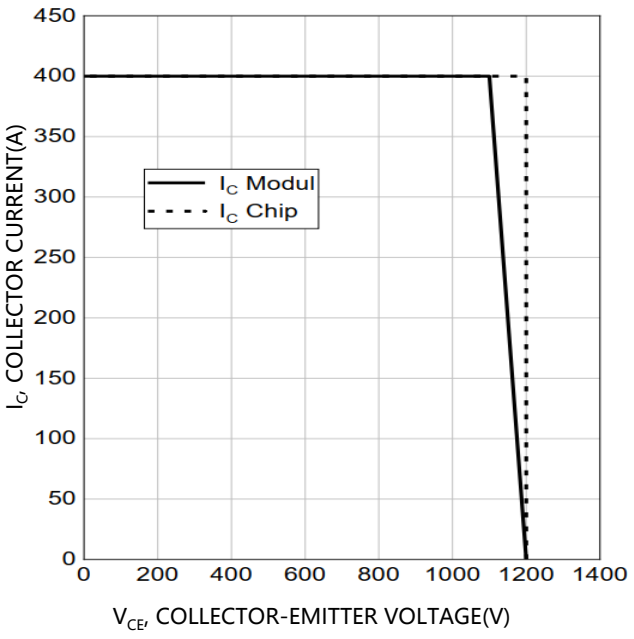
Switching losses IGBT-Inverter (typical)
$E_{on}=f(I_C)$, $E_{off}=f(I_C)$ at $V_{GE}=\pm15V$, R_G=2.0Ω and V_{CE}=600V

Fig. 3



Switching losses IGBT-Inverter (typical)
$E_{on}=f(I_C)$, $E_{off}=f(I_C)$ at $V_{GE}=\pm15V$, I_C=200A and V_{CE}=600V

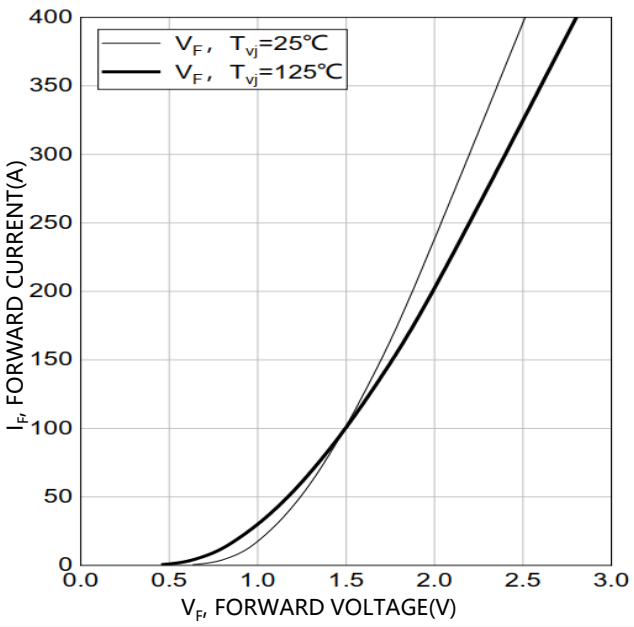
Fig. 4



RBSOA IGBT,Inverter (typical)

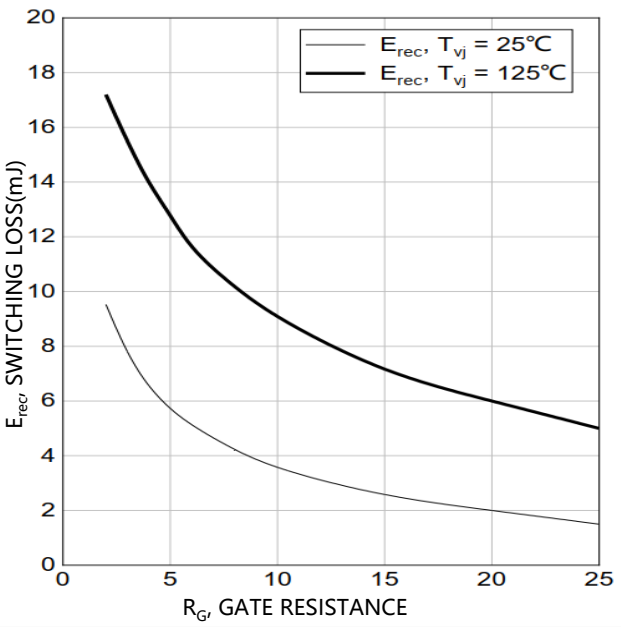
Typical Characteristics

Fig. 5



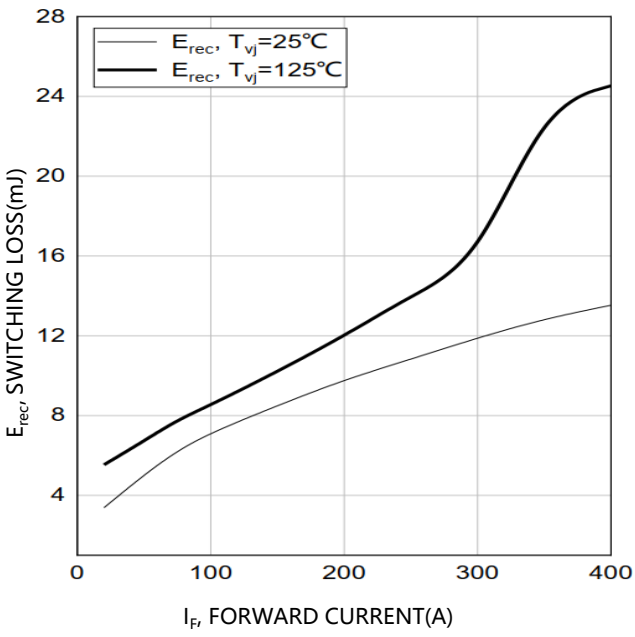
Forward characteristic of Diode-Inverter (typical)
$I_F=f(V_F)$

Fig. 6



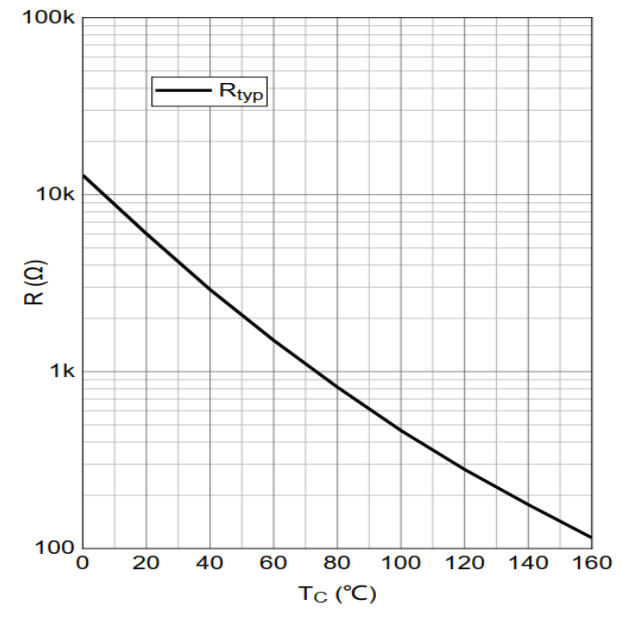
Switching losses Diode-Inverter (typical)
$E_{rec}=f(I_F)$ at I_F=200A and V_{CE}=600V

Fig. 7



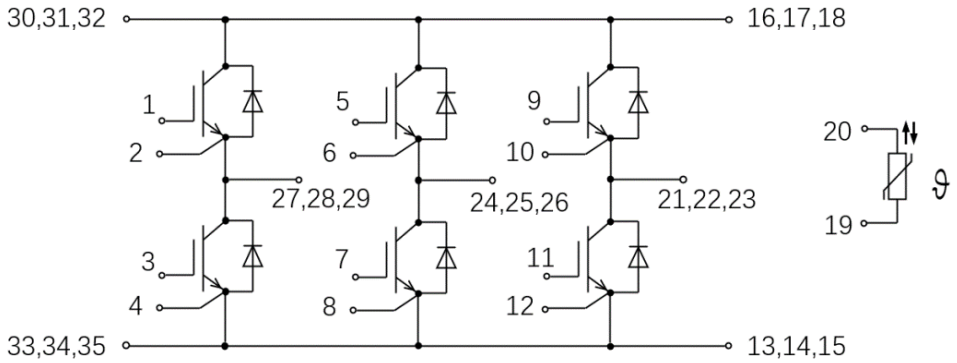
Switching losses Diode-Inverter (typical)
$E_{rec}=f(I_F)$ at R_G=2.0Ω and V_{CE}=600V

Fig. 8



NTC-Thermistor-temperature characteristic (typical)
R = f (T)

Circuit Diagram



Package Outlines (mm)