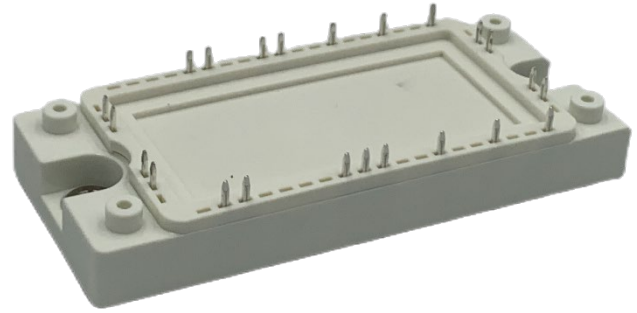


Electrical Features

- Trench/Fieldstop IGBT
- V_{CEsat} with positive Temperature Coefficient
- Low V_{CEsat}

Typical Applications

- Motor Drives
- Servo Drives
- Auxiliary Inverters



Mechanical Features

- High power density
- Integrated NTC temperature sensor
- Copper base plate
- Solder contact technology
- Standard housing

IGBT, Inverter

Maximum Rated Values						
Symbol	Item	Conditions	Rating	Unit		
IGBT						
V_{CES}	Collector-emitter voltage	$T_{vj}=25^{\circ}C$	1200	V		
V_{GES}	Gate-emitter voltage	-	± 20	V		
I_C	Collector current,DC	$T_C=80^{\circ}C, T_{vj}=175^{\circ}C$	50	A		
I_{CRM}	Repetitive peak collector current	$t_p=1ms$	100	A		
P_{tot}	Total power dissipation	$T_C=25^{\circ}C, T_{vj}=175^{\circ}C$	278	W		
Characteristics Values						
Symbol	Item	Conditions	Values			Unit
IGBT			Min.	Typ.	Max.	
I_{CES}	Collector-emitter cut-off current	$V_{CE}=1200V, V_{GE}=0V, T_{vj}=25^{\circ}C$	-	-	1	mA
I_{GES}	Gate leakage current	$V_{CE}=0V, V_{GE}=20V, T_{vj}=25^{\circ}C$	-	-	100	nA
$V_{GE(th)}$	Gate-emitter threshold voltage	$I_C=1.5mA, V_{CE}=V_{GE}, T_{vj}=25^{\circ}C$	5.2	5.7	6.6	V
V_{CEsat}	Collector-emitter saturation voltage	$I_C=50A$ $V_{GE}=15V$ $T_{vj}=25^{\circ}C$	-	2.25	3.1	
		$T_{vj}=125^{\circ}C$	-	2.82	-	
		$T_{vj}=150^{\circ}C$	-	2.93	-	
C_{ies}	Input capacitance	$V_{CE}=25V, V_{GE}=0V$ $f=1MHz, T_{vj}=25^{\circ}C$	-	3.535	-	nF
C_{oes}	Output capacitance		-	0.231	-	
C_{res}	Reverse transfer capacitance		-	0.119	-	
Q_G	Gate charge	$V_{CC}=600V, I_C=50A$ $V_{GE}=-15...+15V, T_{vj}=25^{\circ}C$	-	0.201	-	μC
R_g	Internal gate resistance	$T_{vj}=25^{\circ}C$	-	-	-	Ω

t _{d(on)}	Turn-on delay time	V _{CC} =600V I _C =50A V _{GE} =±15V R _{G(on)} =51Ω R _{G(off)} =51Ω	T _{vj} =25°C	-	205.9	-	ns
			T _{vj} =125°C	-	240.5	-	
			T _{vj} =150°C	-	250.9	-	
t _r	Rise time		T _{vj} =25°C	-	163.9	-	
			T _{vj} =125°C	-	177.9	-	
			T _{vj} =150°C	-	179.6	-	
t _{d(off)}	Turn-off delay time		T _{vj} =25°C	-	445.0	-	
			T _{vj} =125°C	-	748.8	-	
			T _{vj} =150°C	-	760.4	-	
t _f	Fall time		T _{vj} =25°C	-	203.9	-	
			T _{vj} =125°C	-	328.5	-	
			T _{vj} =150°C	-	335.6	-	
E _{on}	Turn-on energy (per pulse)	V _{CC} =600V, I _C =50A V _{GE} =±15V, R _{G(on)} =51Ω di/dt=480A/μs(T _{vj} =150°C)	T _{vj} =25°C	-	15.17	-	mJ
			T _{vj} =125°C	-	20.44	-	
			T _{vj} =150°C	-	21.26	-	
E _{off}	Turn-off energy (per pulse)		T _{vj} =25°C	-	3.09	-	
			T _{vj} =125°C	-	4.96	-	
			T _{vj} =150°C	-	5.71	-	
SC data	Short-circuit current	V _{CC} =600V, V _{GE} ≤15V, T _{vj} =125°C V _{CES} ≤1200V, t _p ≤10μs	-	200	-	A	
R _{thJC}	Thermal resistance, junction to case	Per IGBT	-	-	0.54	K/W	
R _{thCH}	Thermal resistance, case to heatsink	Per IGBT λgrease=1W/(m·K)	-	0.295	-	K/W	
T _{vjop}	Temperature under switching conditions		-40		150	°C	
Diode, Inverter							
Maximum Rated Values							
Symbol	Item	Conditions	Rating			Unit	
V _{RRM}	Repetitive peak reverse voltage	T _{vj} =25°C	1200			V	
I _F	Forward current, DC	T _C =80°C, T _{vj} =175°C	50			A	
I _{FRM}	Repetitive peak forward current	t _p =1ms	100			A	
I ² t	I ² t-value	V _R =0V, t _p =10ms, T _{vj} =125°C	667			A ² s	
Characteristic Values							
V _F	Continuous forward voltage	I _F =50A V _{GE} =0V	T _{vj} =25°C	Min.	Typ.	Max.	V
			T _{vj} =125°C	-	2.60	3.6	
			T _{vj} =150°C	-	2.34	-	
I _{RM}	Peak reverse recovery current		T _{vj} =25°C	-	16.5	-	A
			T _{vj} =125°C	-	22.2	-	
			T _{vj} =150°C	-	24.0	-	
t _{rr}	Reverse recovery time	I _F =50A V _{GE} =-15V -di _F /dt=480A/μs (T _{vj} =150°C)	T _{vj} =25°C	-	95.48	-	ns
			T _{vj} =125°C	-	950.2	-	
			T _{vj} =150°C	-	992.8	-	
Q _r	Recovered charge		T _{vj} =25°C	-	1.74	-	μC
			T _{vj} =125°C	-	8.32	-	
			T _{vj} =150°C	-	9.99	-	

E _{rec}	Reverse recovery energy		T _{vj} =25°C	-	0.99	-	mJ
			T _{vj} =125°C	-	2.32	-	
			T _{vj} =150°C	-	2.81	-	
R _{thJC}	Thermal resistance, junction to case	per diode	-	-	0.81	K/W	
R _{thCH}	Thermal resistance, case to heatsink	Per diode, λ _{grease} =1 W/(m • K)	-	0.44	-	K/W	
T _{vjop}	Temperature under switching conditions		-40		150	°C	

Diode, Rectifier

Maximum Rated Values						
Symbol	Item	Conditions	Rating			Unit
V _{RRM}	Repetitive peak reverse voltage	T _{vj} =25°C	1800			V
I _{FRMSM}	Maximum RMS forward current per chip	T _C =80°C	70			A
I _{RMSM}	Maximum RMS current at rectifier output	T _C =80°C	80			A
I _{FSM}	Surge forward current	t _p = 10ms, T _{vj} =150°C	420			A
I ² t	I ² t-value	T _p = 10ms, T _{vj} =150°C	882			A ² s

Characteristic Values							
Symbol	Item	Conditions	Values			Unit	
			Min.	Typ.	Max.		
V _F	Continuous forward voltage	I _F =50A V _{GE} =0V	T _{vj} =25°C	-	1.43	1.8	V
			T _{vj} =125°C	-	1.35	-	
			T _{vj} =150°C	-	1.31	-	
I _R	Reverse current	V _R =1800V	T _{vj} =25°C	-	-	10	μA
			T _{vj} =125°C	-	-	-	
			T _{vj} =150°C	-	-	-	
R _{thJC}	Thermal resistance, junction to case	per diode	-	-	0.85	K/W	
R _{thCH}	Thermal resistance, case to heatsink	Per diode, λ _{grease} =1 W/(m • K)	-	0.465	-	K/W	
T _{vjop}	Temperature under switching conditions		-40		150	°C	

IGBT, Brake-Chopper

Maximum Rated Values						
Symbol	Item	Conditions	Values			Unit
V _{CES}	Collector-emitter voltage	T _{vj} =25°C	1200			V
V _{GES}	Gate-emitter voltage	-	±20			V
I _C	Collector current,DC	T _C =100°C, T _{vj} =175°C	25			A
I _{CRM}	Repetitive peak collector current	t _p =1ms	50			A
P _{tot}	Total power dissipation	T _C =25°C, T _{vj} =175°C	151			W

Characteristic Values						
Symbol	Item	Conditions	Values			Unit
			Min.	Typ.	Max.	
I _{CES}	Collector-emitter cut-off current	V _{CE} =1200V, V _{GE} =0V, T _{vj} =25°C	-	-	1	mA
I _{GES}	Gate leakage current	V _{CE} =0V, V _{GE} =20V, T _{vj} =25°C	-	-	100	nA
V _{GE(th)}	Gate-emitter threshold voltage	I _C =0.5mA, V _{CE} =V _{GE} , T _{vj} =25°C	5.5	5.9	6.6	V

V_{CEsat}	Collector-emitter saturation voltage	$I_C=25A$ $V_{GE}=15V$	$T_{vj}=25^{\circ}C$	-	1.90	2.5	V
			$T_{vj}=125^{\circ}C$	-	2.30	-	
			$T_{vj}=150^{\circ}C$	-	2.49	-	
C_{ies}	Input capacitance	$V_{CE}=25V, V_{GE}=0V$ $f=1MHz, T_{vj}=25^{\circ}C$	-	1.77	-	nF	
C_{oes}	Output capacitance		-	0.17	-		
C_{res}	Reverse transfer capacitance		-	0.06	-		
Q_G	Gate charge	$V_{CC}=600V, I_C=25A$ $V_{GE}=-15...+15V, T_{vj}=25^{\circ}C$	-	0.171	-	μC	
R_g	Internal gate resistance	$T_{vj}=25^{\circ}C$	-	-	-	Ω	
$t_{d(on)}$	Turn-on delay time	$V_{CC}=600V$ $I_C=25A$ $V_{GE}=\pm 15V$ $R_{G(on)}=51\Omega$ $R_{G(off)}=51\Omega$	$T_{vj}=25^{\circ}C$	-	96.6	-	ns
			$T_{vj}=125^{\circ}C$	-	152.1	-	
			$T_{vj}=150^{\circ}C$	-	159.6	-	
t_r	Rise time		$T_{vj}=25^{\circ}C$	-	53.6	-	
			$T_{vj}=125^{\circ}C$	-	80.2	-	
			$T_{vj}=150^{\circ}C$	-	86.0	-	
$t_{d(off)}$	Turn-off delay time		$T_{vj}=25^{\circ}C$	-	101.8	-	
			$T_{vj}=125^{\circ}C$	-	308.6	-	
			$T_{vj}=150^{\circ}C$	-	326.1	-	
t_f	Fall time		$T_{vj}=25^{\circ}C$	-	359.1	-	
			$T_{vj}=125^{\circ}C$	-	531.4	-	
			$T_{vj}=150^{\circ}C$	-	681.2	-	
E_{on}	Turn-on energy (per pulse)	$T_{vj}=25^{\circ}C$	-	2.22	-	mJ	
		$T_{vj}=125^{\circ}C$	-	6.12	-		
		$T_{vj}=150^{\circ}C$	-	7.21	-		
E_{off}	Turn-off energy (per pulse)	$T_{vj}=25^{\circ}C$	-	0.72	-		
		$T_{vj}=125^{\circ}C$	-	2.32	-		
		$T_{vj}=150^{\circ}C$	-	2.40	-		
SC data	Short-circuit current	$V_{CC}=600V, V_{GE}\leq 15V, T_{vj}=125^{\circ}C$ $V_{CES}\leq 1200V, t_p\leq 10\mu s$	-	90	-	A	
R_{thJC}	Thermal resistance, junction to case	Per IGBT	-	-	0.95	K/W	
R_{thCH}	Thermal resistance, case to heatsink	Per IGBT $\lambda_{grease}=1W/(m\cdot K)$	-	0.52	-	K/W	
T_{vjop}	Temperature under switching conditions		-40		150	$^{\circ}C$	
Diode, Brake-Chopper							
Maximum Rated Values							
Symbol	Item	Conditions	Rating			Unit	
V_{RRM}	Repetitive peak reverse voltage	$T_{vj}=25^{\circ}C$	1200			V	
I_F	Forward current, DC	$T_C=80^{\circ}C, T_{vj}=175^{\circ}C$	15			A	
I_{FRM}	Repetitive peak forward current	$t_p=1ms$	30			A	
I^2t	I^2t -value	$V_R=0V, t_p=10ms, T_{vj}=125^{\circ}C$	166			A^2s	
Characteristic Values							
V_F	Continuous forward voltage	$I_F=15A$ $V_{GE}=0V$	$T_{vj}=25^{\circ}C$	-	2.13	2.8	V
			$T_{vj}=125^{\circ}C$	-	1.82	-	
			$T_{vj}=150^{\circ}C$	-	1.78	-	

I _{RM}	Peak reverse recovery current	V _R =600V I _F =25A V _{GE} =-15V -di _F /dt=440A/us (T _{vj} =150°C)	T _{vj} =25°C	-	13.6	-	A		
			T _{vj} =125°C	-	14.7	-			
			T _{vj} =150°C	-	14.8	-			
t _{rr}	Reverse recovery time		V _R =600V I _F =25A V _{GE} =-15V -di _F /dt=440A/us (T _{vj} =150°C)	T _{vj} =25°C	-	99.9	-	ns	
				T _{vj} =125°C	-	539.1	-		
				T _{vj} =150°C	-	603.2	-		
Q _r	Recovered charge			V _R =600V I _F =25A V _{GE} =-15V -di _F /dt=440A/us (T _{vj} =150°C)	T _{vj} =25°C	-	0.38	-	μC
					T _{vj} =125°C	-	5.45	-	
					T _{vj} =150°C	-	5.81	-	
E _{rec}	Reverse recovery energy				V _R =600V I _F =25A V _{GE} =-15V -di _F /dt=440A/us (T _{vj} =150°C)	T _{vj} =25°C	-	0.03	-
		T _{vj} =125°C				-	1.92	-	
		T _{vj} =150°C				-	2.07	-	
R _{thJC}	Thermal resistance, junction to case	per diode				-	-	1.5	K/W
R _{thCH}	Thermal resistance, case to heatsink	Per diode, λ _{grease} =1 W/(m • K)	-			0.82	-	K/W	
T _{vjop}	Temperature under switching conditions		-40				150	°C	

Note:

IGBT electrical characteristics according to IEC 60747 – 9

Diode electrical characteristics according to IEC 60747 – 2

NTC Thermistor Characteristics

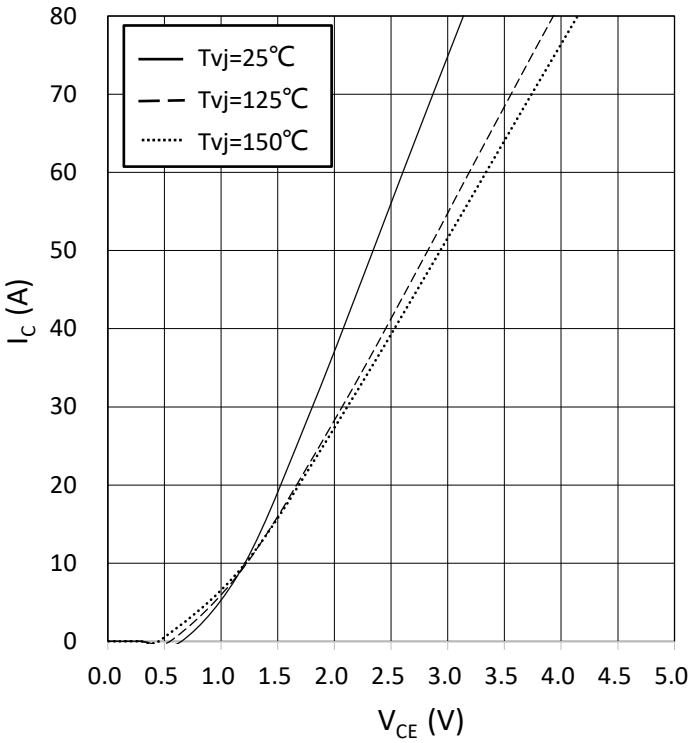
Symbol	Item	Conditions	Values			Unit
			Min.	Typ.	Max.	
R ₂₅	Rated resistance	T _C =25°C	-	5	-	kΩ
ΔR/R	Deviation of resistance	T _C =100°C, R ₁₀₀ =493Ω	-5	-	5	%
P ₂₅	Power dissipation	T _C =25°C	-	-	20	mW
B _{25/50}	B-constant	R ₂ =R ₂₅ exp[B _{25/50} (1/T ₂ -1/(298.15K))]	-	3375	-	K
B _{25/80}	B-constant	R ₂ =R ₂₅ exp[B _{25/80} (1/T ₂ -1/(298.15K))]	-	3411	-	
B _{25/100}	B-constant	R ₂ =R ₂₅ exp[B _{25/100} (1/T ₂ -1/(298.15K))]	-	3433	-	

Module

Symbol	Item	Conditions	Rating			Unit
V _{ISOL}	Isolation voltage	Terminals to baseplate, RMS, f=50Hz, t=1min	2500			V
T _{vjmax}	Maximum junction temperature	-	175			°C
T _{vjop}	Operating junction temperature	Continuous operationg(under switching)	-40~150			°C
T _{stg}	Storage temperature	-	-40~125			°C
Symbol	Item	Conditions	Values			Unit
			Min.	Typ.	Max.	
Ms	Mounting torque	Mounting to heat sink, M5 screw	3	-	6	Nm
ds	Creepage distance	Terminal to terminal	-	-	-	mm
		Terminal to base plate	-	10	-	
da	Clearance	Terminal to terminal	-	-	-	mm
		Terminal to base plate	-	7.5	-	
m	Weight	-	-	175	-	g

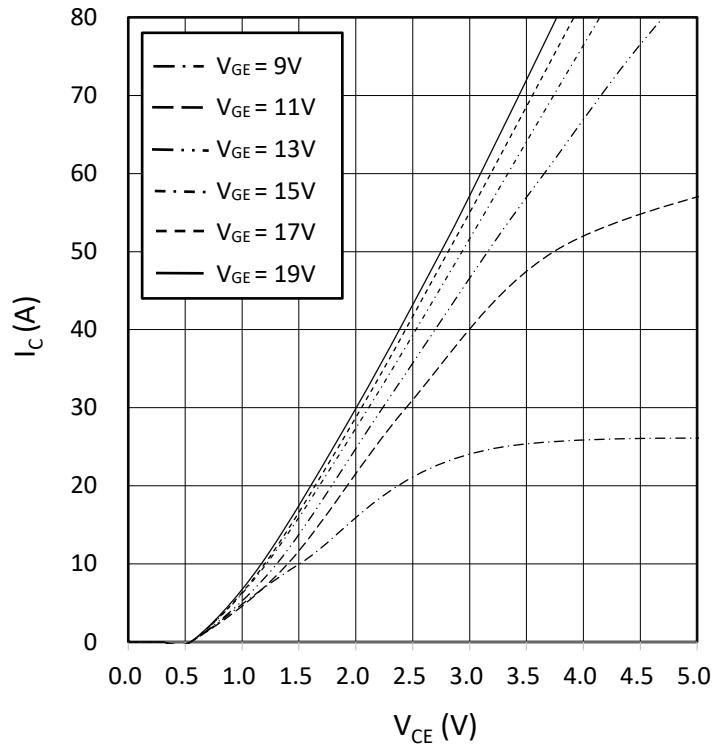
output characteristic IGBT,Inverter (typical)

$I_C = f(V_{CE})$
 $V_{GE} = 15V$



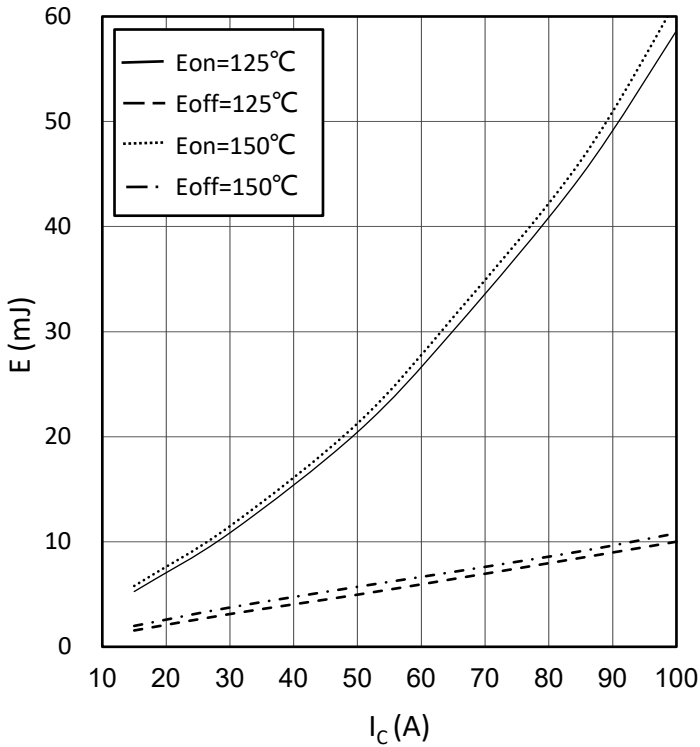
output characteristic IGBT,Inverter (typical)

$I_C = f(V_{CE})$
 $T_{vj} = 150^\circ C$



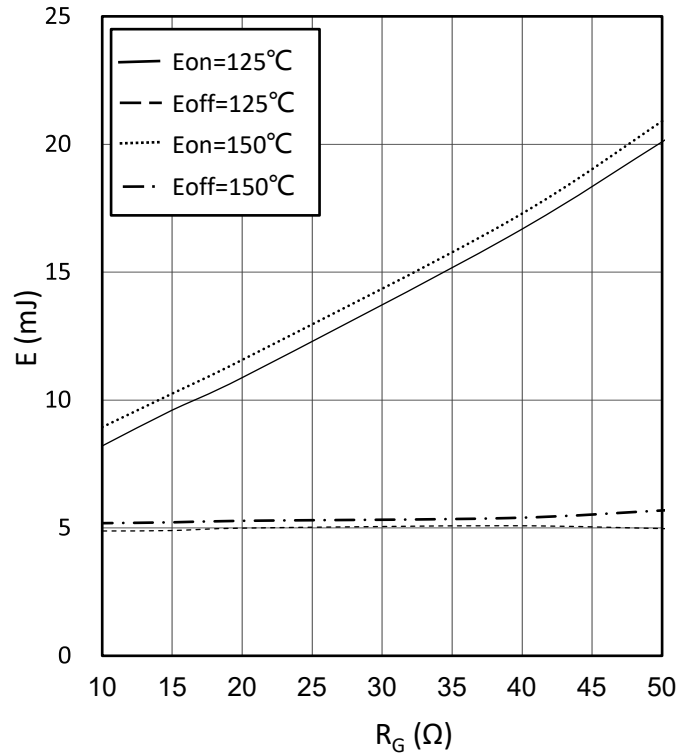
switching losses IGBT,Inverter (typical)

$E_{on} = f(I_C), E_{off} = f(I_C)$
 $V_{GE} = \pm 15V, R_{Gon} = 51\Omega, R_{Goff} = 51\Omega, V_{CE} = 600V$



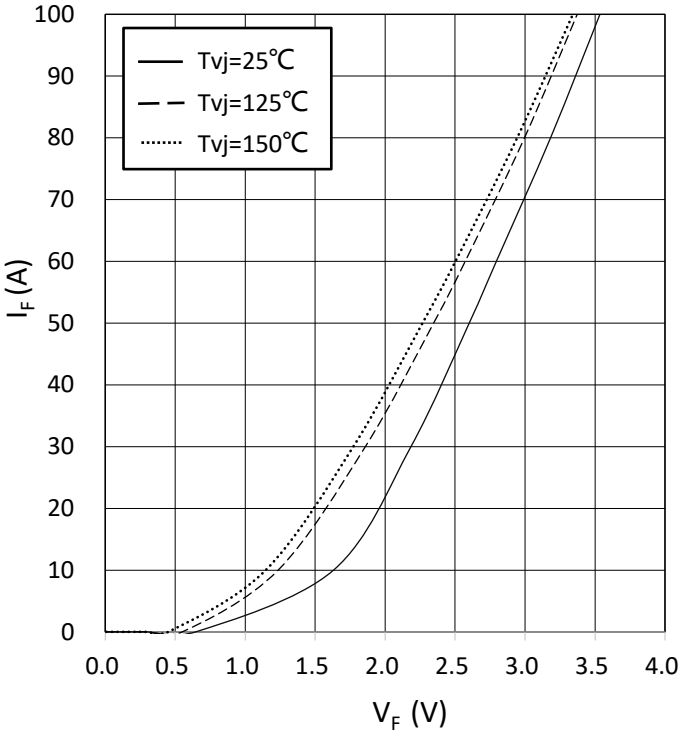
switching losses IGBT,Inverter (typical)

$E_{on} = f(R_G), E_{off} = f(R_G)$
 $V_{GE} = \pm 15V, I_C = 50A, V_{CE} = 600V$



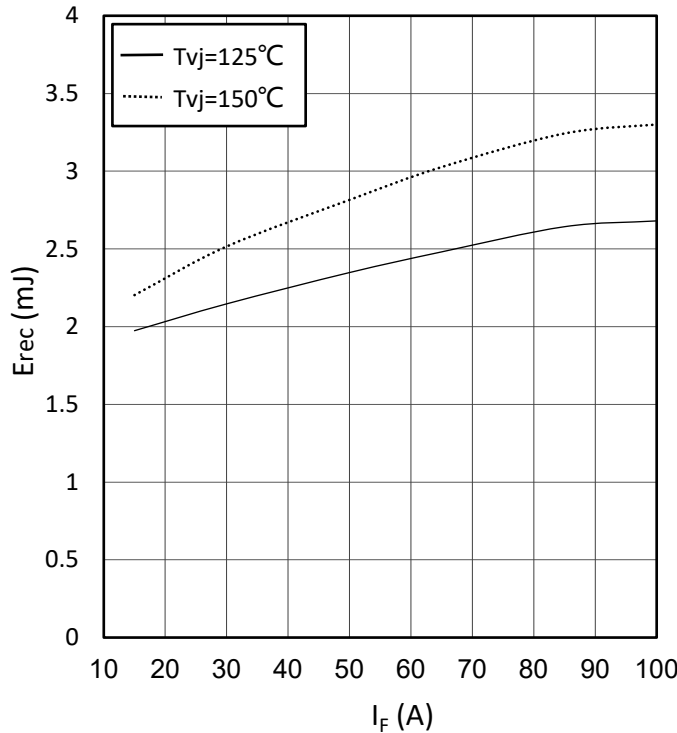
forward characteristic of Diode, Inverter (typical)

$I_F = f(V_F)$



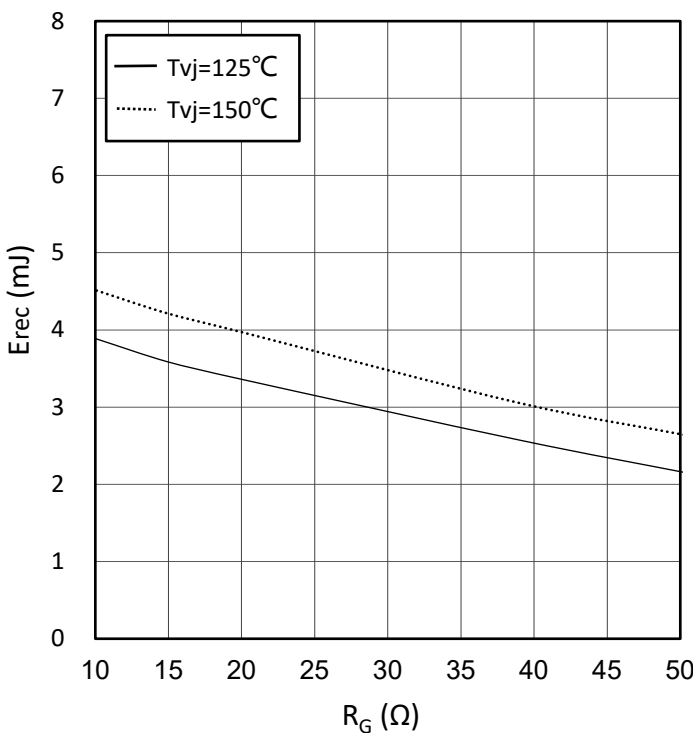
switching losses Diode, Inverter (typical)

$E_{rec} = f(I_F)$
 $R_{Gon} = 51\Omega, V_{CE} = 600\text{ V}$



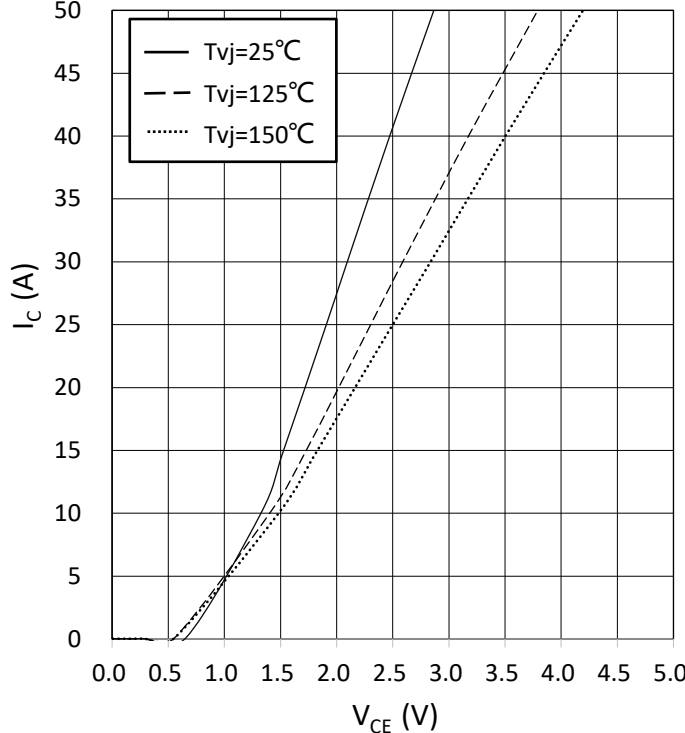
switching losses Diode, Inverter (typical)

$E_{rec} = f(R_G)$
 $I_F = 50\text{A}, V_{CE} = 600\text{V}$



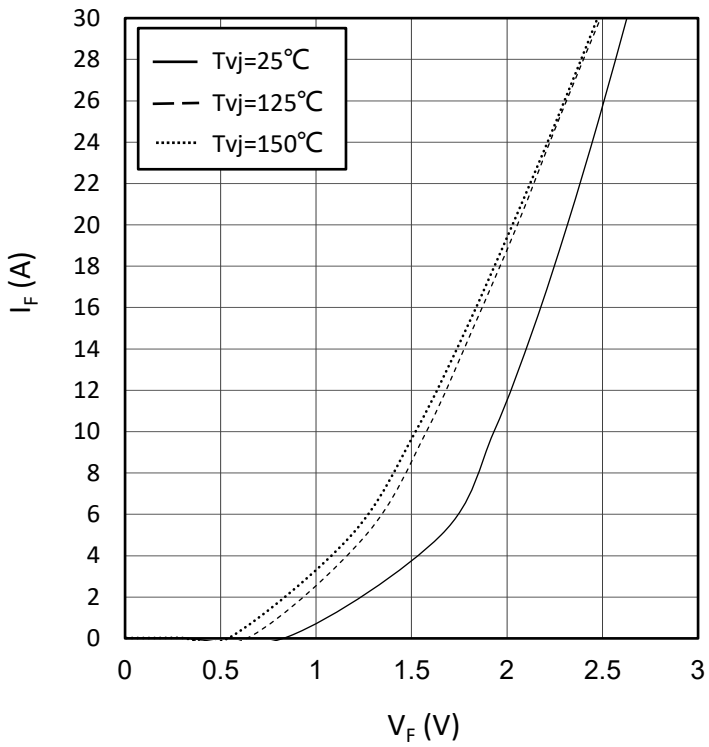
output characteristic IGBT, Brake-Chopper (typical)

$I_C = f(V_{CE})$
 $V_{GE} = 15\text{V}$



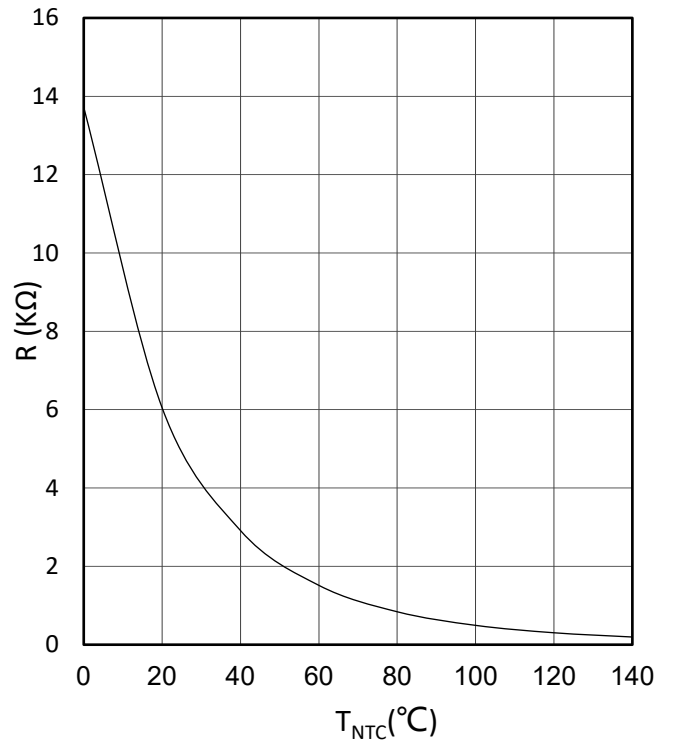
forward characteristic of Diode, Brake-Chopper (typical)

$I_F = f(V_F)$



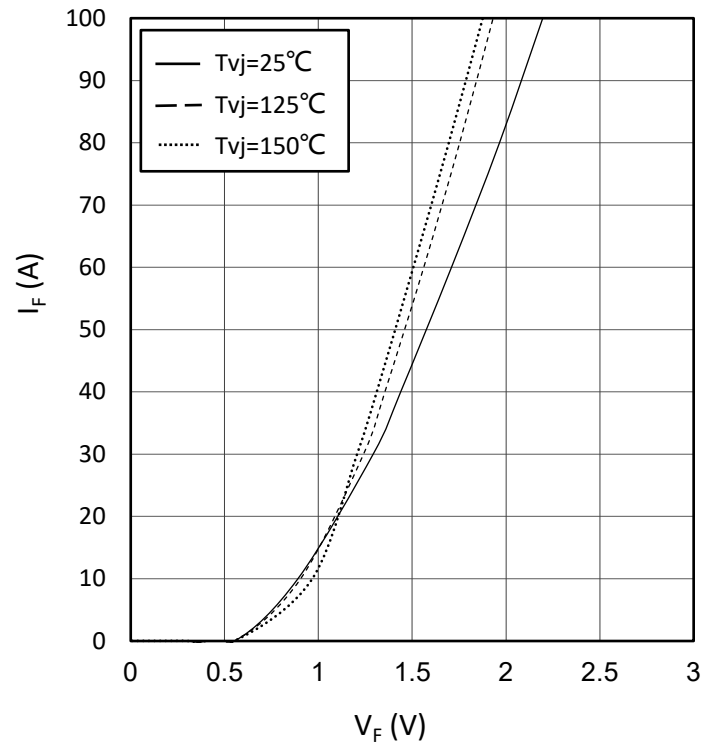
NTC-Thermistor-temperature characteristic(typical)

$R=f(T)$



Forward characteristic of Diode, Rectifier(typical)

$I_F = f(V_F)$



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序号 Item	日期 Date	变更记录及描述 Change History Description	版本序号 Rev. item	经办人 Responsibility
1	23.4.15	更新实物图、尺寸图。版本变更为1.3。	2023 4 Ver1.3	梁华文

单击下面可查看定价，库存，交付和生命周期等信息

[>>芯长征](#)