

62mm module with fast Trench/Fieldstop IGBT and Fast Recovery Diode

Features

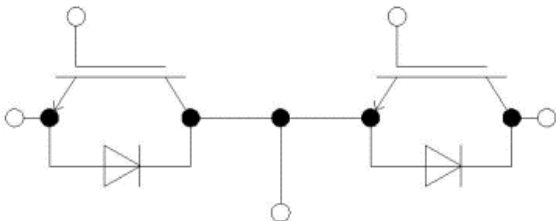
- 1200V 300A, $V_{CE(sat)}(typ.)=2.24V$
- Lower losses and higher energy
- Trench+Field Stop Technology
- Low V_{CEsat}

Applications

- High Power Converters
- Motor drives
- UPS Systems
- Wind Turbines



Equivalent Circuit Schematic



IGBT - Inverter
Maximum Rated Values

Symbol	Description	Conditions	Values	Unit
V_{CES}	Collector-Emitter Voltage	$T_{vj}=25^{\circ}C$	1200	V
V_{GES}	Gate-Emitter Peak Voltage	$T_{vj}=25^{\circ}C$	± 20	V
I_C	Continuous DC Collector Current	$T_C=100^{\circ}C$	300	A
I_{CRM}	Repetitive Peak Collector Current	$t_p=1ms$	600	A
P_{tot}	Total Power Dissipation	$T_C=25^{\circ}C, T_{vj\ max}=175^{\circ}C$	1898	W

Characteristic Values

Symbol	Description	Conditions	Values			Unit
			Min.	Typ.	Max.	
$V_{CE(sat)}$	Collector-Emitter Saturation Voltage	$V_{GE}=15V, I_C=300A, T_{vj}=25^{\circ}C$	---	2.24	---	V
		$V_{GE}=15V, I_C=300A, T_{vj}=125^{\circ}C$	---	2.61	---	V
$V_{GE(th)}$	Gate Threshold Voltage	$V_{GE}=V_{CE}, I_C=6.0mA$	---	5.36	---	V
I_{CES}	Collector-Emitter Cut-Off Current	$V_{CE}=1200V, V_{GE}=0V$	---	---	1	mA
I_{GES}	Gate-Emitter Leakage Current	$V_{GE}=20V, V_{CE}=0V$	---	---	750	nA
R_{Gint}	Internal Gate Resistor	$T_{vj}=25^{\circ}C$	---	3	---	Ω
Q_G	Gate Charge	$V_{GE}=-15V...+15V$	---	2.5	---	μC
C_{ies}	Input Capacitance	$V_{CE}=25V, V_{GE}=0V, f=1MHz$	---	22.28	---	nF
C_{res}	Reverse Transfer Capacitance		---	0.57	---	nF
$t_{d(on)}$	Turn-on Delay Time	$V_{CC}=600V$ $V_{GE}=\pm 15V$ $I_C=300A$ $R_G=1.8\Omega$ Inductive Load $T_{vj}=25^{\circ}C$	---	283	---	ns
t_r	Turn-on Rise Time		---	668	---	ns
$t_{d(off)}$	Turn-off Delay Time		---	105	---	ns
t_f	Turn-off Fall Time		---	96	---	ns
E_{on}	Turn-on Switching Loss		---	45.2	---	mJ
E_{off}	Turn-off Switching Loss		---	34.8	---	mJ
I_{SC}	Short Circuit Data	$V_{GE}\leq 15V, V_{CC}=800V$ $t_p\leq 10\mu s, T_{vj}=150^{\circ}C$	---	1240	---	A
R_{thJC}	Thermal Resistance, Junction to Case	Per IGBT	---	0.079	---	K/W
$T_{VJ OP}$	Virtual Junction Temperature	Under Switching	-40	---	150	$^{\circ}C$

Diode - Inverter

Maximum Rated Values

Symbol	Description	Conditions	Values	Unit
V_{RRM}	Repetitive Peak Reverse Voltage	$T_{vj}=25^{\circ}C$	1200	V
I_F	Continuous DC Forward Current		300	A
I_{FRM}	Repetitive Peak Collector Current	$t_p=1ms$	600	A

Characteristic Values

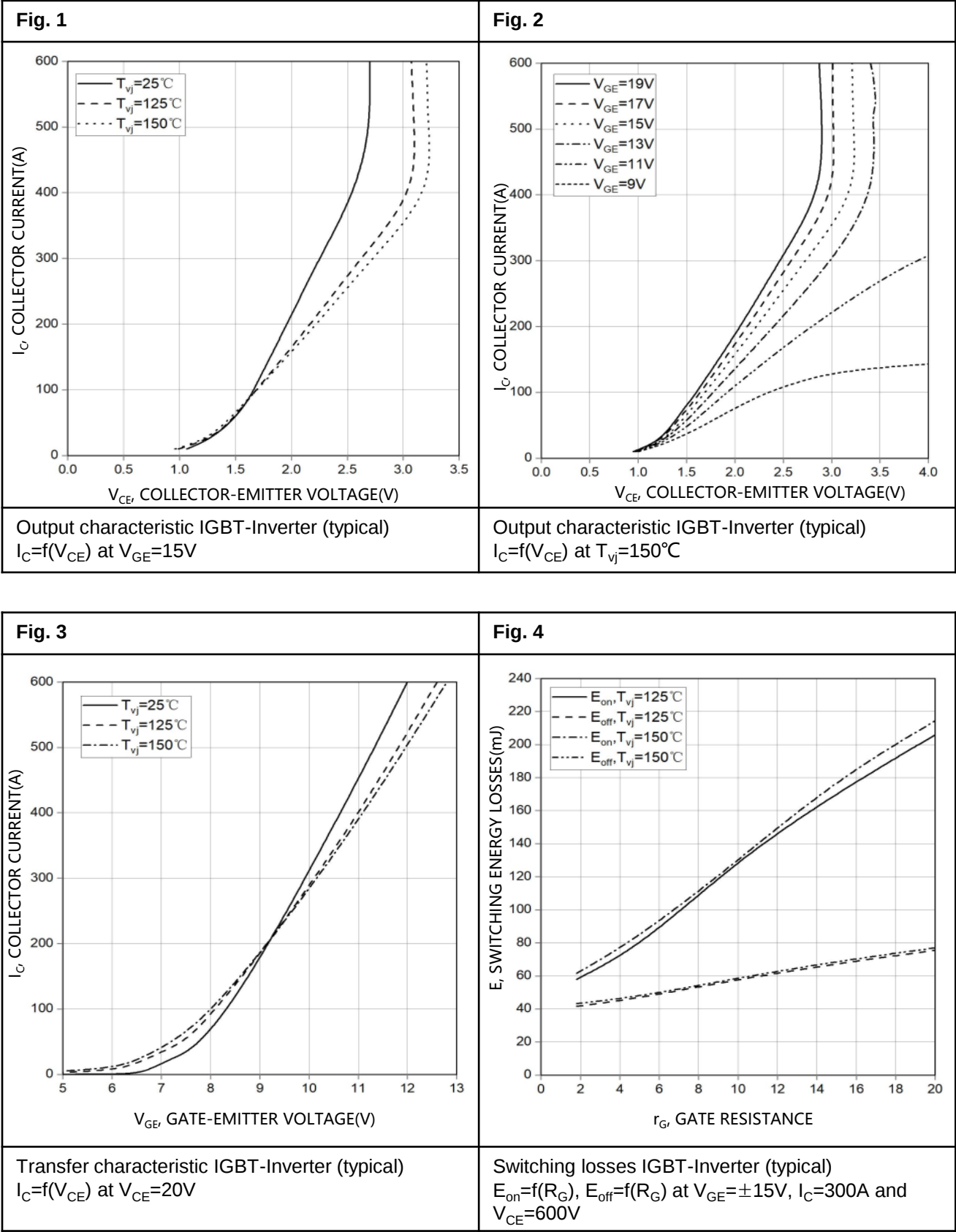
Symbol	Description	Conditions	Values			Unit
			Min.	Typ.	Max.	
V_F	Forward Voltage	$I_F=300A, V_{GE}=0V, T_{vj}=25^{\circ}C$	---	2.2	---	V
		$I_F=300A, V_{GE}=0V, T_{vj}=125^{\circ}C$	---	1.78	---	V
I_{rr}	Reverse Recovery Current	$I_F=300A, V_R=600V, V_{GE}=-15V$ $T_{vj}=25^{\circ}C$	---	80	---	A
Q_r	Recovered Charge		---	4.2	---	uC
E_{rec}	Reverse Recovery Energy		---	1.3	---	mJ
$T_{VJ\ OP}$	Virtual Junction Temperature	Under Switching	-40	---	150	$^{\circ}C$

Module

Symbol	Description	Conditions	Values	Unit
V_{ISOL}	Isolation Test Voltage	RMS, f=50Hz, t=1min	4.0	KV
	Material of Module Baseplate		Cu	
	Internal Isolation	Basic Insulation (Class 1, IEC 61140)	Al_2O_3	
	Creepage Distance	Terminal to Terminal	23.1	mm
	Clearance	Terminal to Terminal	11	mm
CTI	Comparative Tracking Index		> 400	

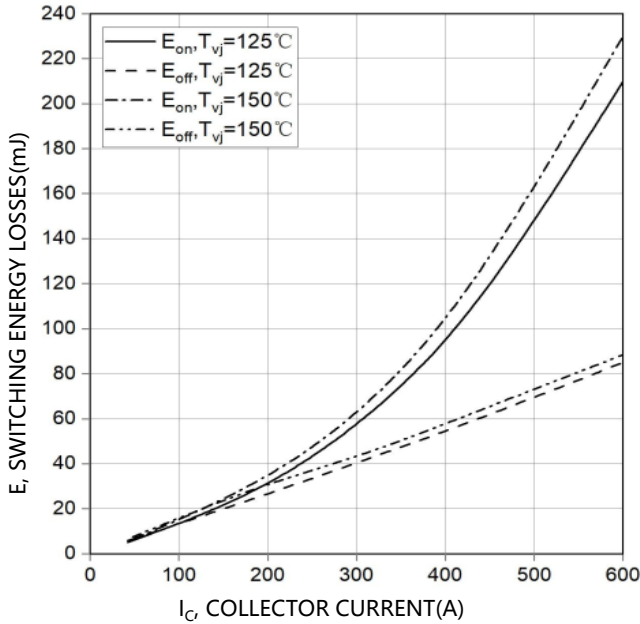
Symbol	Description	Conditions	Values			Unit
			Min.	Typ.	Max.	
L_{sCE}	Stray inductance module		---	22	---	nH
$R_{CC'+EE'}$	Module lead resistance, terminals-chip	Per switch, $T_c=25^{\circ}C$	---	0.8	---	mΩ
T_{stg}	Storage Temperature		-40	---	125	$^{\circ}C$
M	Mounting Torque for Modul Mounting		3.0	---	6.0	Nm
G	Weight		---	324	---	g

Typical Characteristics



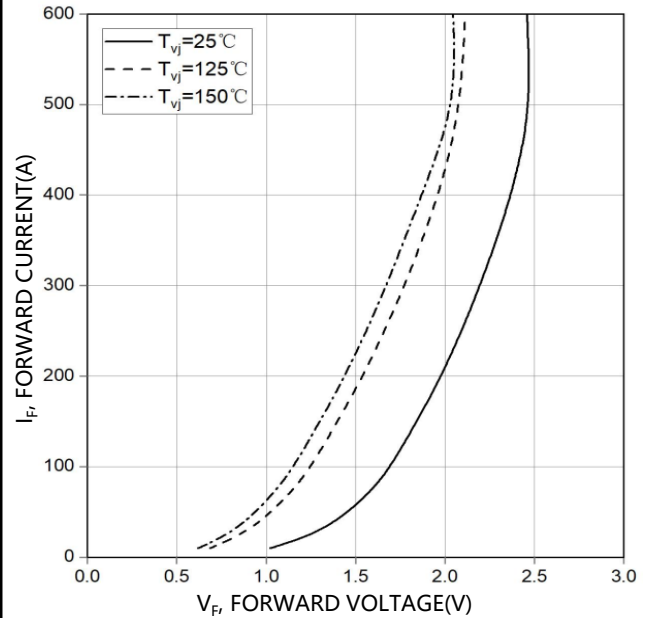
Typical Characteristics

Fig. 5



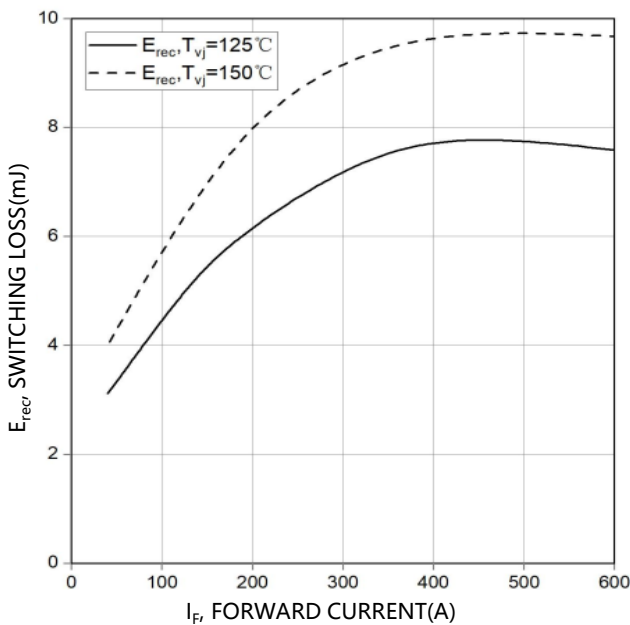
Switching losses IGBT-Inverter (typical)
 $E_{on}=f(I_C)$, $E_{off}=f(I_C)$ at $V_{GE}=\pm 15V$, $R_G=1.8\Omega$ and $V_{CE}=600V$

Fig. 6



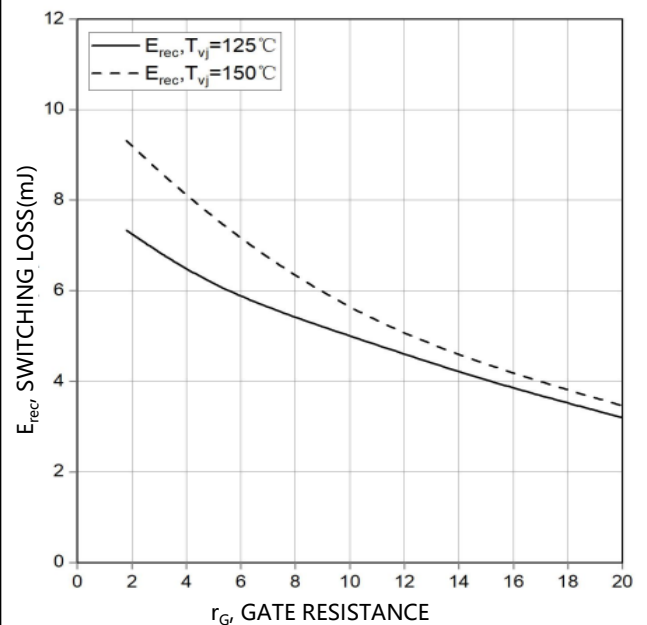
Forward characteristic of Diode-Inverter (typical)
 $I_F=f(V_F)$

Fig. 7



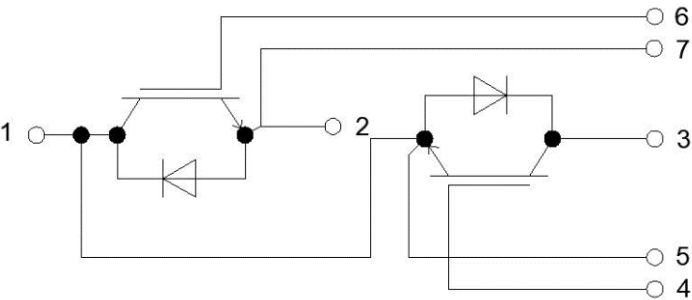
Switching losses Diode-Inverter (typical)
 $E_{recr}=f(I_F)$ at $R_G=1.8\Omega$ and $V_{CE}=600V$

Fig. 8



Switching Losses Diode-Inverter (typical)
 $E_{recr}=f(R_G)$ at $I_F=300A$ and $V_{CE}=600V$

Circuit Diagram



Package Outlines (mm)

