D. G. M. E.	DG15N120	版本号：V1.0
	绝缘栅双极型晶体管	

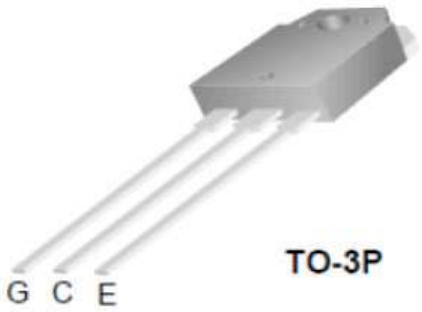
产品概述

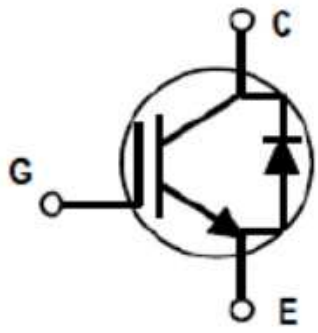
IGBT既有功率MOSFET输入阻抗高，控制功率小，易于驱动，控制简单的特点，又有双极晶体管的导通电压低，通态电流大，损耗小的显著优点。在提倡节能减排、低碳经济的时代，具备节能效率高，便于规模化生产等优点的IGBT已成为功率半导体市场发展的主流技术。

产品特点

- ●采用NPT技术
- ●高开关速度：tf = 170ns
- ●低饱和压降：VCE(sat) = 2.3V @ Ic=15A
- ●高输入阻抗
- ●热稳定性好

封装：TO-3P





应用领域

主要用于感应加热领域，如电磁炉。

特征参数

符 号	额定值	单 位
$V_{(BR)CES}$	1200	V
I_C	15	A
$V_{CE(sat)}$	2.3	V

极限值

除非另有规定，T_a=25℃

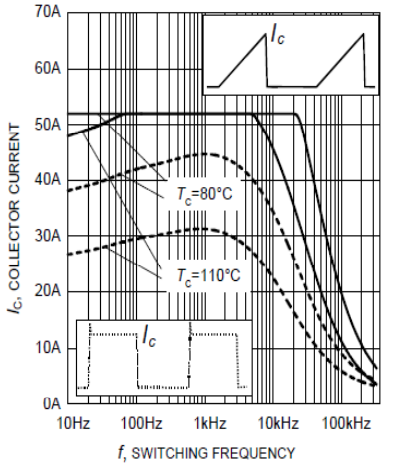
参数名称	符号	额定值	单位
集电极-发射极击穿电压	V_{CE}	1200	V
连续集电极	I_C	15	A
脉冲集电极电流	I_{Cpuls}	50	A
栅-发射极电压	V_{GE}	±30	V
耗散功率 T_C=25℃	P_D	200	W
工作温度范围	T_J	-55 to +150	℃
贮存温度范围	T_{STG}	-55 to +150	℃

电参数

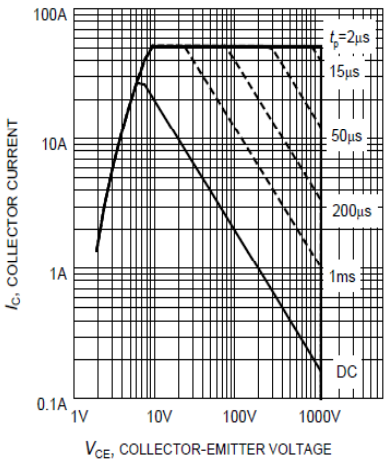
除非另有规定，T_a=25℃

参数名称	符号	测试条件	规范值			单位
			最小	典型	最大	
$V_{(BR)CES}$	集电极-发射极击穿电压	V_{GE}=0 I_C=1000uA	1200			V
I_{CES}	集电极-发射极泄漏电流	V_{GE}=0 V_{CE}=1200V			180	uA
I_{GSS}	栅极-发射极泄漏电流	V_{CE}=0 V_{GE}=20V			100	nA
$V_{GE(th)}$	开启电压	V_{GE}=V_{CE}, I_D=600uA	3.0		6.0	V
$V_{CE(sat)}$	集电极-发射极饱和压降	V_{GE}=15V, I_C=15A		2.3	2.8	V
g_{fs}	跨导	V_{CE}=40V, I_C=15A		11		S
Ciss	输入电容	V_{CE}=25V, V_{GE}=0, f=1MHz		1250	1550	pF
Coss	输出电容			100	120	pF
Crss	反向恢复电容			65	80	pF
Qg	栅电荷	V_{cc}=960V I_C=15A V_{GE}=15V		125	175	nC
td(on)	导通延时	V_{CC}=800V, I_C=15A， R_G=33 Ω 感性负载		33	46	ns
tr	上升时间			21	36	ns
td(off)	关断延时			223	300	ns
tf	下降时间			150	250	ns
Eon	开启能量			0.83	1.4	mJ
Eoff	关断能量			0.91	1.2	mJ
td(on)	导通延时	V_{CC}=800V, I_C=15A， R_G=33 Ω T_C=150℃ 感性负载		31	46	ns
tr	上升时间			21	36	ns
td(off)	关断延时			231	300	ns
tf	下降时间			150	250	ns
Eon	开启能量			1.5	2.2	mJ
Eoff	关断能量			1.05	1.9	mJ
V_{FM}	二极管正向压降	IF=15A		1.9	2.7	V
trr	二极管反向恢复时间	IF=15A dI/dt=200A/ us		210	330	ns
Irr	二极管反向峰值电流			27	40	A
Qrr	二极管反向恢复电荷			2830	6650	nC

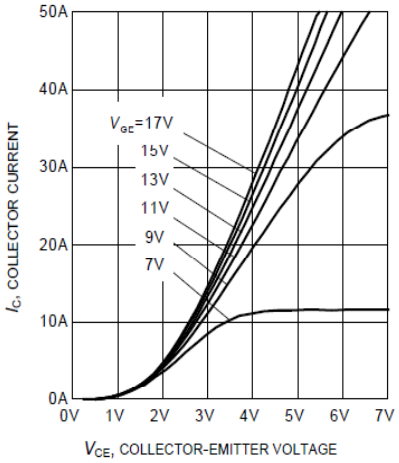
典型特性曲线



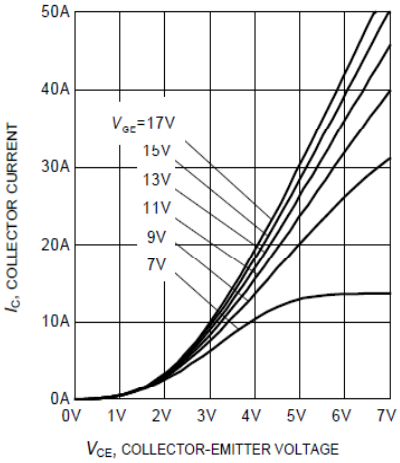
集电极电流与开关频率的关系曲线



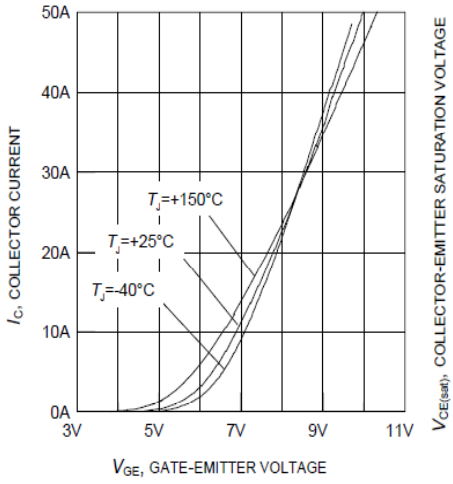
安全工作区



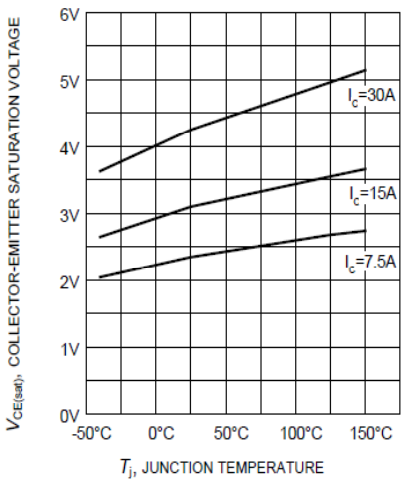
输出特性曲线（T_C=25℃）



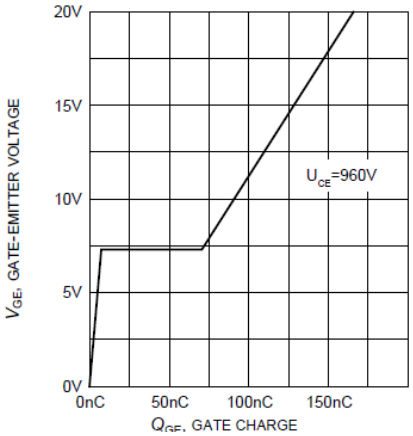
输出特性曲线（T_C=150℃）



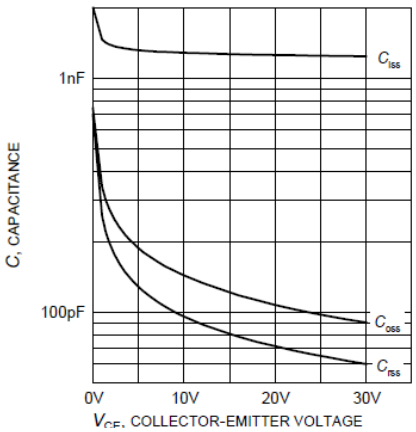
传输特性曲线



集电极-发射极饱和压降与结温的关系曲线

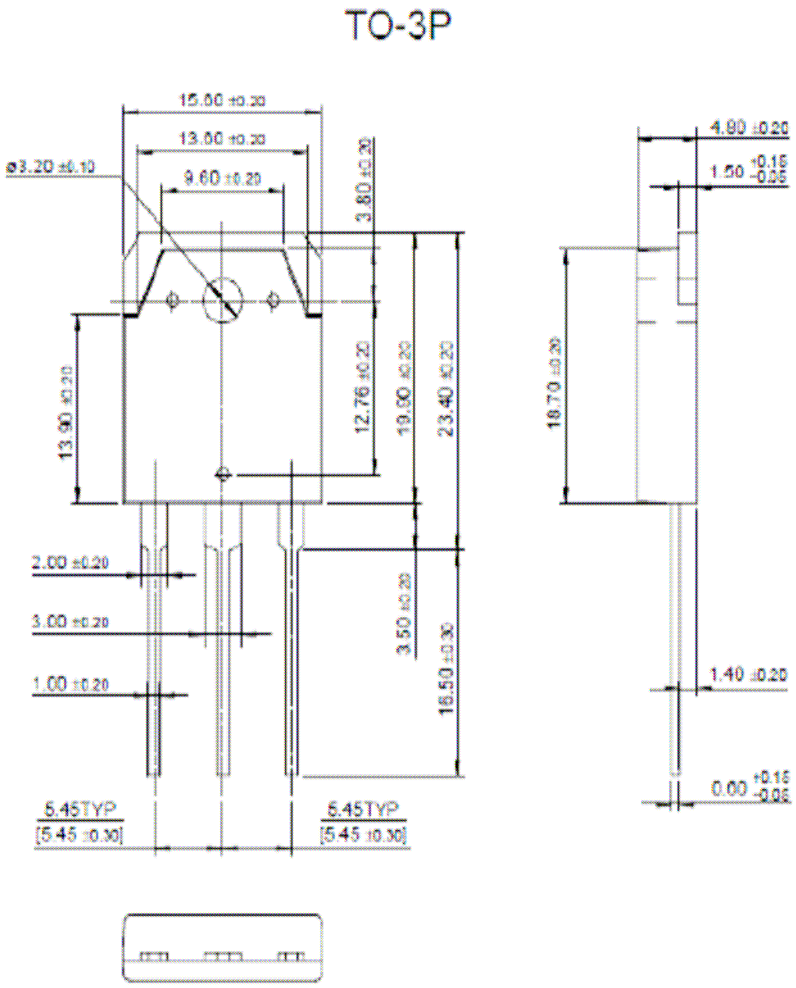


栅电荷特性曲线
(I_C=15A)



电容与集电极-发射极电压关系曲线
（V_{GE}=0V f=1MHZ）

附录：封装尺寸



D. G. M. E.	DG15N120	Version No.: V1.0
	IGBT	

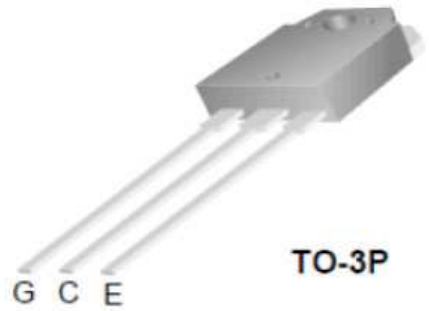
General Description

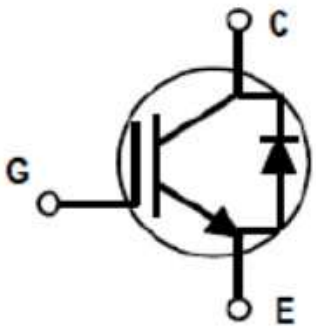
IGBT has been the major switching device in power electronic applications as it has the merits of both power bipolar and power MOSFET. It has been widely used in high voltage field, which ranges from industrial areas such as inverters, high voltage switch, and motor operation to PDP or home appliance.

Features

- Employing NPT technology
- High speed switching: t_f = 170ns
- Low saturation voltage: $V_{CE(sat)}$ = 2.3V @ I_c=15A
- High input impedance

Package: TO-3P





Applications

Induction Heating

Characteristic parameter

SYMBOL	Value	Unit
$V_{(BR)CES}$	1200	V
I_C	15	A
$V_{CE(sat)}$	2.3	V

Maximum Ratings

Tc=25℃, unless otherwise specified

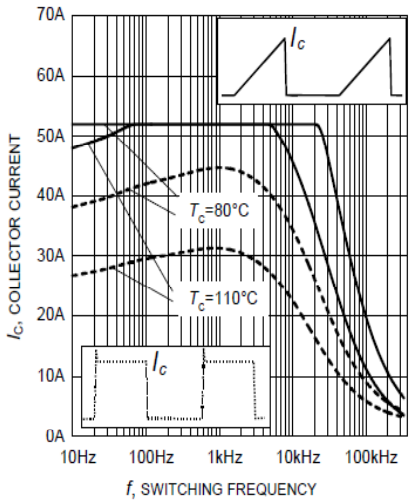
PARAMETER	SYMBOL	Value	Unit
Collector-emitter voltage	V_{CE}	1200	V
DC collector	I_C	15	A
Pulsed collector current	I_{Cpuls}	50	A
Gate-emitter voltage	V_{GE}	±30	V
Power dissipation Tc=25℃	P_D	200	W
Operating junction temperature	T_J	-55 to +150	℃
Storage temperature	T_{STG}	-55 to +150	℃

Electrical Characteristic

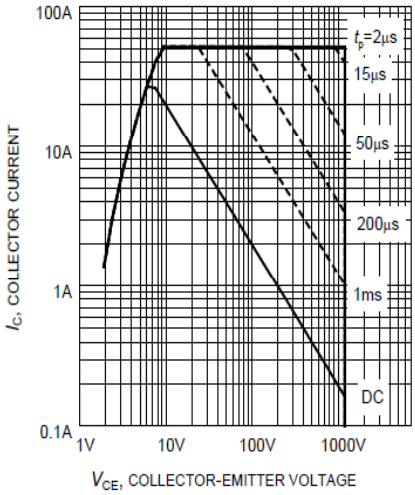
at Tc=25℃, unless otherwise specified

PARAMETER	SYMBOL	Conditions	Value			Unit
			Min.	Typ.	Max.	
$V_{(BR)CES}$	Collector-emitter breakdown voltage	V_{GE}=0 I_C=1000uA	1200			V
I_{CES}	Zero gate voltage collector current	V_{GE}=0 V_{CE}=1200V			180	uA
I_{GSS}	Gate-emitter leakage current	V_{CE}=0 V_{GE}=20V			100	nA
$V_{GE(th)}$	Gate-emitter threshold voltage	V_{GE}=V_{CE}, I_D=600uA	3.0		6.0	V
$V_{CE(sat)}$	Collector-emitter saturation voltage	V_{GE}=15V, I_C=15A		2.3	2.8	V
g_{fs}	Transconductance	V_{CE}=40V, I_C=15A		11		S
Ciss	Input capacitance	V_{CE}=25V, V_{GE}=0, f=1MHz		1250	1550	pF
Coss	output capacitance			100	120	pF
Crss	Reverse transfer capacitance			65	80	pF
Qg	Gate charge	V_{cc}=960V I_C=15A V_{GE}=15V		125	175	nC
td(on)	Turn-on delay time	V_{CC}=800V, I_C=15A, R_G=33 Ω Inductive load		33	46	ns
tr	Rise time			21	36	ns
td(off)	Turn-off delay time			223	300	ns
tf	Fall time			150	250	ns
Eon	Turn-on energy			0.83	1.4	mJ
Eoff	Turn-off energy			0.91	1.2	mJ
td(on)	Turn-on delay time	V_{CC}=800V, I_C=15A, R_G=33 Ω T_C=150℃ Inductive load		31	46	ns
tr	Rise time			21	36	ns
td(off)	Turn-off delay time			231	300	ns
tf	Fall time			150	250	ns
Eon	Turn-on energy			1.5	2.2	mJ
Eoff	Turn-off energy			1.05	1.9	mJ
V_{FM}	Diode forward voltage	IF=15A		1.9	2.7	V
trr	Diode reverse recovery time	IF=15A dI/dt=200A/ us		210	330	ns
Irr	Diode peak reverse recovery current			27	40	A
Qrr	Diode reverse recovery charge			2830	6650	nC

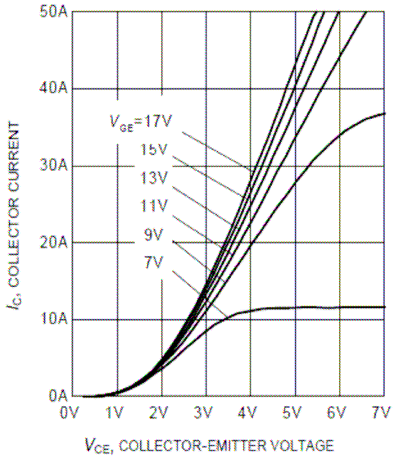
Characteristic curves



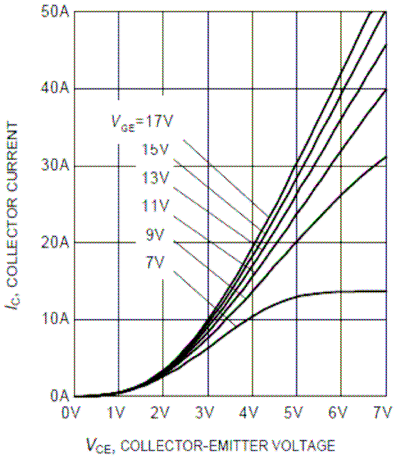
Collector current as a function of switching frequency



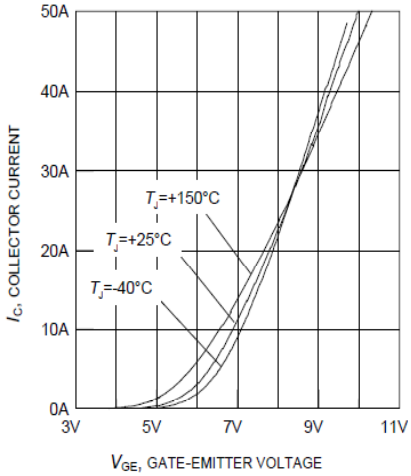
Safe operating area



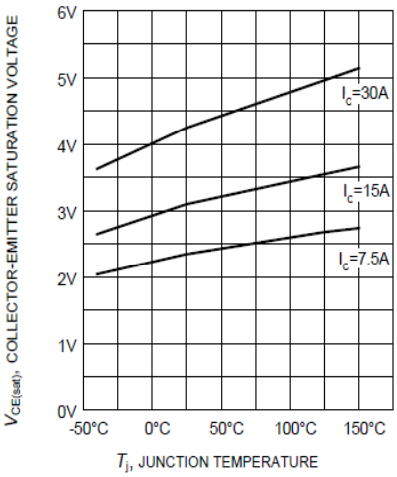
Typical output characteristic
（T_C=25℃）



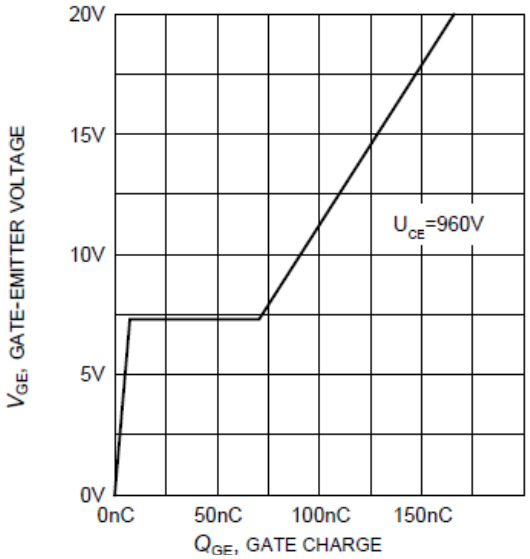
Typical output characteristic
（T_C=150℃）



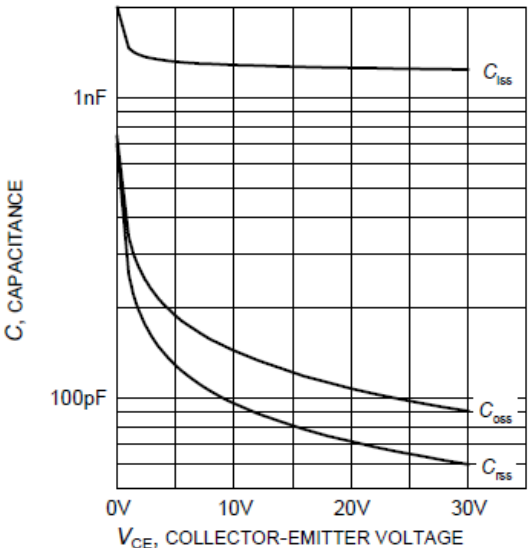
Typical transfer characteristic



Typical collector-emitter saturation voltage as a function of junction temperature



Typical gate charge
(I_C=15A)



ypical capacitance as a function of
collector-emitter voltage
（V_{GE}=0V f=1MHZ）

Package Dimension