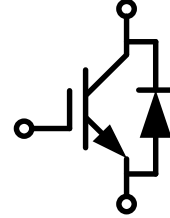


IGBT Discrete with Anti-Parallel Diode

电气特性:

- 1200V 沟槽栅/场终止工艺
- 低开关损耗
- 正温度系数



典型应用:

- 充电桩
- UPS
- 逆变器



$V_{CES} = 1200V$, $I_{C\ nom} = 40A$ / $I_{CRM} = 80A$

双极晶体管/IGBT

最大额定值 / Maximum Ratings

Parameter	Conditions	Symbol	Value	Unit
集电极-发射极电压 Collector-Emitter voltage	$T_{vj} = 25^{\circ}C$	V_{CES}	1200	V
连续集电极直流电流 Continuous DC collector current	$T_C = 100^{\circ}C$, $T_{vj\ max} = 175^{\circ}C$	$I_{C\ nom}$	40	A
集电极重复峰值电流 Repetitive peak collector current	$t_p = 1\ ms$	I_{CRM}	80	A
总功率损耗 Total power dissipation	$T_C = 25^{\circ}C$, $T_{vj\ max} = 175^{\circ}C$	P_{tot}	270	W
栅极-发射极电压 Gate emitter voltage		V_{GE}	± 20	V

特征值 / Characteristic Values

Parameter	Conditions	Symbol	Value			Unit
			Min.	Typ.	Max.	
集电极-发射极饱和电压 Collector-Emitter saturation voltage	$V_{GE} = 15V$, $I_C = 40A$ $V_{GE} = 15V$, $I_C = 40A$ $V_{GE} = 15V$, $I_C = 40A$	$T_{vj} = 25^{\circ}C$ $T_{vj} = 125^{\circ}C$ $T_{vj} = 150^{\circ}C$	V_{CEsat}	1.60 1.90 2.00	2.20	V
栅极-发射极阈值电压 Gate-Emitter threshold voltage	$I_C = 0.5mA$, $V_{GE} = V_{CE}$	$T_{vj} = 25^{\circ}C$	$V_{GE(th)}$	4.8	5.5	6.2
跨导 Transconductance	$V_{CE} = 20V$, $I_C = 40A$		G_{fs}	27		S

输入电容 Input capacitance	f=1 MHz, V _{CE} =25 V, V _{GE} =0 V	T _{vj} =25°C	C _{ies}	2.56	nF
输出电容 Output capacitance			C _{oes}	0.16	
反向传输电容 Reverse transfer capacitance			C _{res}	0.12	
集电极-发射极截止电流 Collector-emitter cut-off current	V _{CE} =1200V, V _{GE} = 0 V	T _{vj} =25°C	I _{CES}	1	mA
栅极-发射极漏电流 Gate-emitter leakage current	V _{CE} =0 V, V _{GE} = 20 V	T _{vj} =25°C	I _{GES}	200	nA
开通延迟时间 Turn-on delay time	I _C =40A, V _{CE} =600 V V _{GE} =±15 V, R _G =12Ω (电感负载) / (inductive load)	T _{vj} =25°C T _{vj} =125°C T _{vj} =150°C	t _{d on}	84	
上升时间 Rise time				80	
				76	
关断延迟时间 Turn-off delay time	I _C =40A, V _{CE} =600 V V _{GE} =±15 V, R _G =12Ω (电感负载) / (inductive load)	T _{vj} =25°C T _{vj} =125°C T _{vj} =150°C	t _{d off}	264	ns
				298	
				304	
下降时间 Fall time	I _C =40A, V _{CE} =600 V V _{GE} =±15 V, R _G =15Ω (电感负载) / (inductive load)	T _{vj} =25°C T _{vj} =125°C T _{vj} =150°C	t _f	203	
				297	
				283	
开通损耗能量（每脉冲） Turn-on energy loss per pulse	I _C =40A, V _{CE} =600 V V _{GE} =±15 V, R _G =12Ω (电感负载) / (inductive load)	T _{vj} =25°C T _{vj} =125°C T _{vj} =150°C	E _{on}	2.50	mJ
关断损耗能量（每脉冲） Turn-off energy loss per pulse				4.15	
				4.50	
结-外壳热阻 IGBT thermal resistance, junction			R _{thJC}	0.38	K/W
在开关状态下温度 Temperature under switching conditions			T _{vj op}	-40	150 °C

二极管/Diode

最大额定值 / Maximum Ratings

Parameter	Conditions	Symbol	Value	Unit
反向重复峰值电压 Repetitive peak reverse voltage	T _{vj} =25°C	V _{R RM}	1200	V
连续正向直流电流 Continuous DC forward current	T _C =100°C, T _{vj max} =175°C	I _F	8	A
正向重复峰值电流 Repetitive peak forward current	t _p =1ms	I _{FRM}	16	A

特征值 / Characteristic Values

Parameter	Conditions	Symbol	Value			Unit
			Min.	Typ.	Max.	
正向电压 Forward voltage	$I_F=8A, V_{GE}=0V$ $I_F=8A, V_{GE}=0V$ $I_F=8A, V_{GE}=0V$	$T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$ $T_{vj}=150^{\circ}C$	V_F	1.73 1.53 1.48	2.8	V
反向恢复峰值电流 Peak reverse recovery current	$I_F=8A,$ $-di_F/dt=356A/\mu s(T_{vj}=150^{\circ}C)$ $V_R=600V, V_{GE}=-15V$	$T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$ $T_{vj}=150^{\circ}C$	I_{RM}	18 22 25		A
反向恢复电荷 Reverse Recovered charge	$I_F=8A,$ $-di_F/dt=356A/\mu s(T_{vj}=150^{\circ}C)$ $V_R=600V, V_{GE}=-15V$	$T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$ $T_{vj}=150^{\circ}C$	Q_{rr}	2.45 3.38 3.73		μC
反向恢复时间 Reverse Recovery Time	$I_F=8A,$ $-di_F/dt=356A/\mu s(T_{vj}=150^{\circ}C)$ $V_R=600V, V_{GE}=-15V$	$T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$ $T_{vj}=150^{\circ}C$	t_{rr}	186 207 218		ns
反向恢复损耗（每脉冲） Reverse recovered energy	$I_F=8A,$ $-di_F/dt=356A/\mu s(T_{vj}=150^{\circ}C)$ $V_R=600V, V_{GE}=-15V$	$T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$ $T_{vj}=150^{\circ}C$	E_{rec}	0.65 0.88 0.95		mJ
结-外壳热阻 Diode thermal resistance, junction			R_{thJC}	0.45		K/W
在开关状态下温度 Temperature under switching conditions			$T_{vj op}$	-40	175	$^{\circ}C$

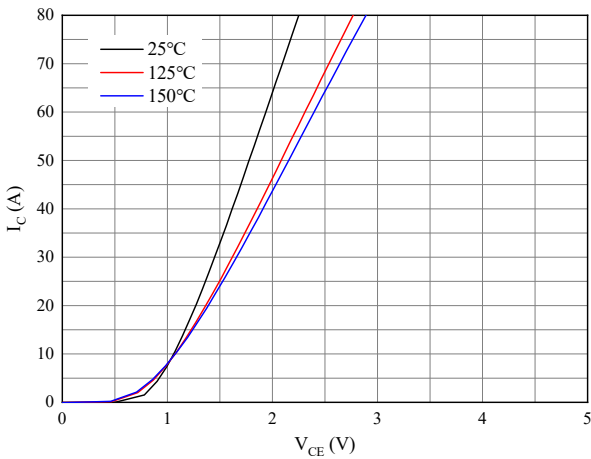


图 1. 典型输出特性 ($V_{GE}=15V$)

Figure 1. Typical output characteristics ($V_{GE}=15V$)

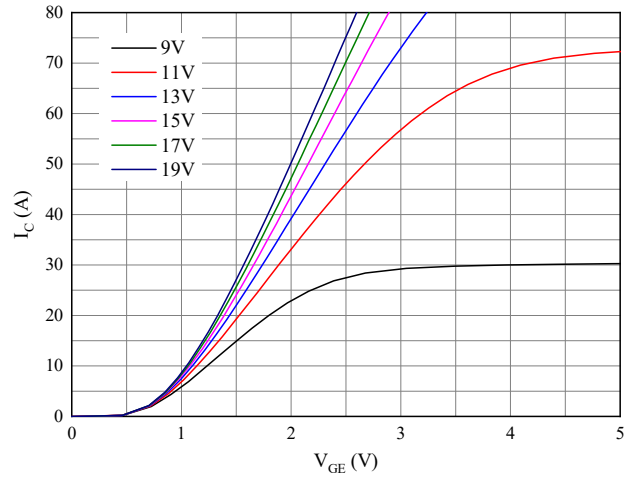


图 2. 典型输出特性 ($T_{vj}=150^{\circ}C$)

Figure 2. Typical output characteristics ($T_{vj}=150^{\circ}C$)

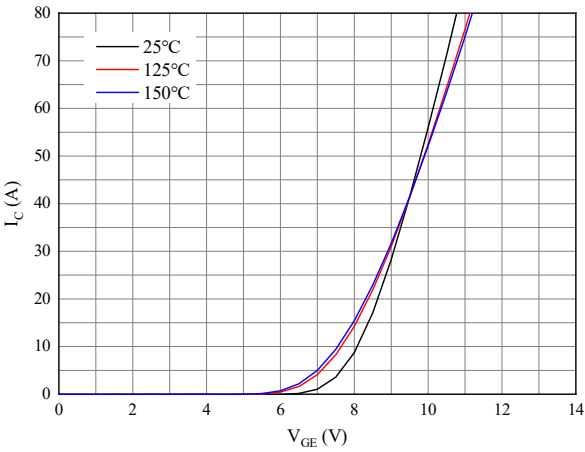


图 3. 典型传输特性 ($V_{CE}=20V$)

Figure 3. Typical transfer characteristic ($V_{CE}=20V$)

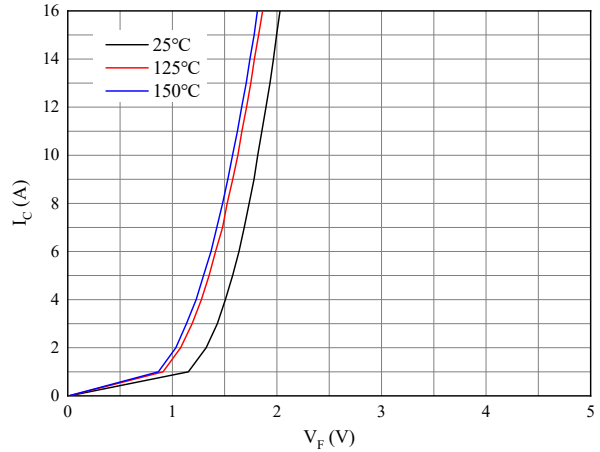


图 4. 正向偏压特性 二极管

Figure 4. Forward characteristic of Diode

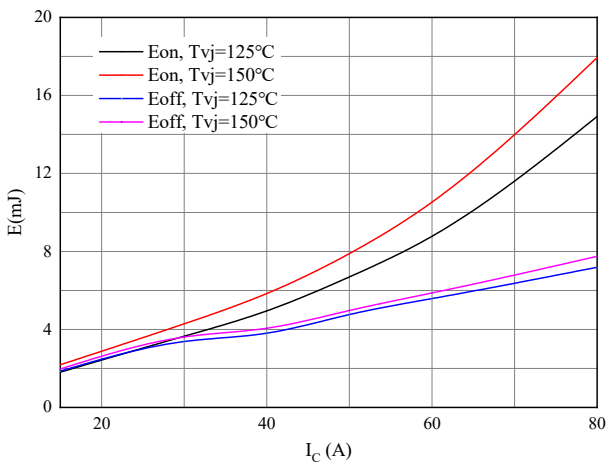


图 5. 开关损耗

Figure 5. Switching losses of IGBT

$V_{GE}=\pm 15V, R_{Gon}=12\Omega, R_{Goff}=12\Omega, V_{CE}=600V$

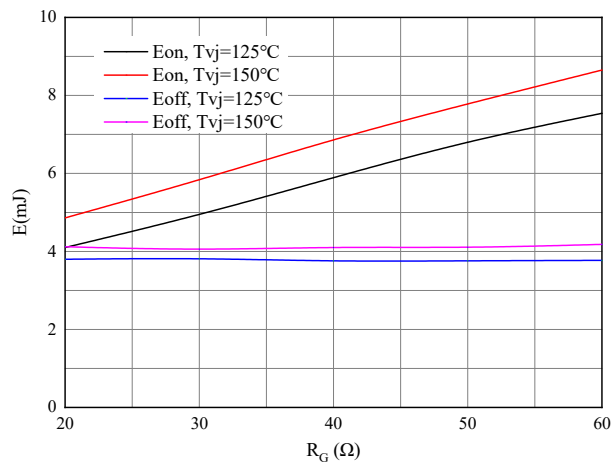


图 6. 开关损耗

Figure 6. Switching losses of IGBT

$V_{GE}=\pm 15V, I_C=8A, V_{CE}=600V$

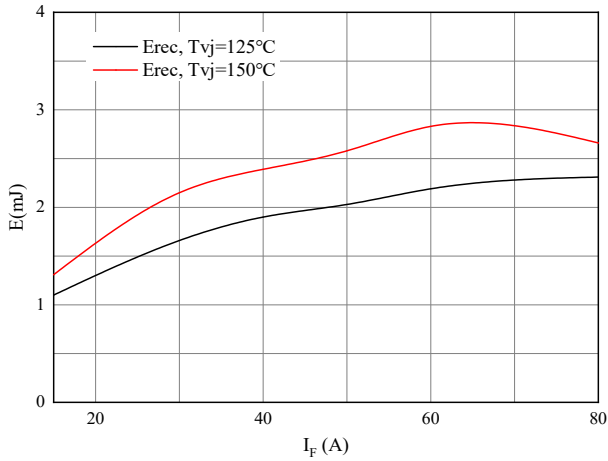


图 7. 开关损耗 二极管

Figure 7. Switching losses of Diode

$R_{gon}=12\Omega, V_{CE}=600V$

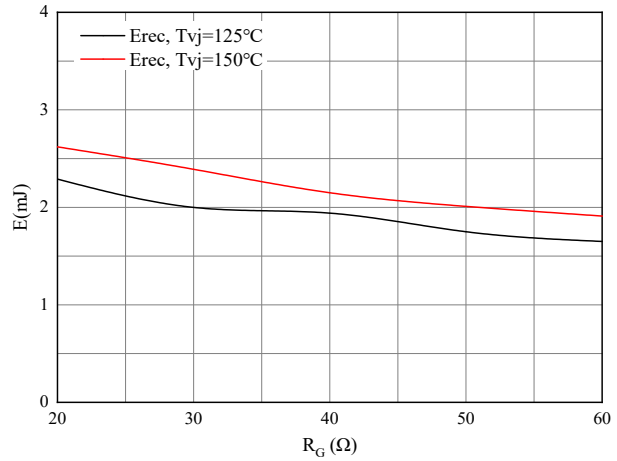


图 8. 开关损耗 二极管

Figure 8. Switching losses of Diode

$I_F=8A, V_{CE}=600V$

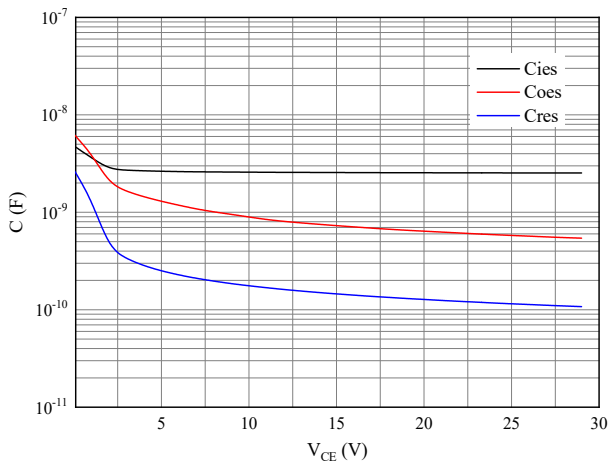


图 9. 电容特性

Figure 9. Capacitance characteristic

