

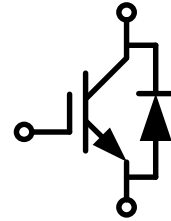
IGBT Discrete with Anti-Parallel Diode

电气特性:

- 650V 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



$V_{CES} = 650V$, $I_{C\ nom} = 75A$ / $I_{CRM} = 150A$

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}	650	V
连续集电极直流电流 Continuous DC collector current	$T_C = 100^{\circ}C$, $T_{vj\ max} = 175^{\circ}C$	$I_{C\ nom}$	75	A
集电极重复峰值电流 Repetitive peak collector current	$t_p = 1\ ms$	I_{CRM}	150	A
总功率损耗 Total power dissipation	$T_C = 25^{\circ}C$, $T_{vj\ max} = 175^{\circ}C$	P_{tot}	395	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	$V_{GE} = 15V$, $I_C = 75A$ $V_{GE} = 15V$, $I_C = 75A$ $V_{GE} = 15V$, $I_C = 75A$	$T_{vj} = 25^{\circ}C$ $T_{vj} = 125^{\circ}C$ $T_{vj} = 150^{\circ}C$	V_{CEsat}	1.63 2.03 2.13	2.10	V
栅极-发射极阈值电压 Gate-Emitter threshold voltage	$I_C = 0.75mA$, $V_{GE} = V_{CE}$	$T_{vj} = 25^{\circ}C$	$V_{GE(th)}$	4.2	5.1	6.0
跨导 Transconductance	$V_{CE} = 20V$, $I_C = 75A$		G_{fs}	91		S

输入电容 Input capacitance	$f=1\text{ MHz}, V_{CE}=25\text{ V}, V_{GE}=0\text{ V}$ $T_{vj}=25^\circ\text{C}$	C_{ies}	7.44	nF
输出电容 Output capacitance		C_{oes}	0.24	
反向传输电容 Reverse transfer capacitance		C_{res}	0.13	
集电极-发射极截止电流 Collector-emitter cut-off current	$V_{CE}=650\text{ V}, V_{GE}=0\text{ V}$ $T_{vj}=25^\circ\text{C}$	I_{CES}	1	mA
栅极-发射极漏电流 Gate-emitter leakage current	$V_{CE}=0\text{ V}, V_{GE}=20\text{ V}$ $T_{vj}=25^\circ\text{C}$	I_{GES}	200	nA
开通延迟时间 Turn-on delay time	$I_C=75\text{ A}, V_{CE}=400\text{ V}$ $V_{GE}=\pm 15\text{ V}, R_G=8\Omega$ (电感负载) / (inductive load)	$T_{vj}=25^\circ\text{C}$ $T_{vj}=125^\circ\text{C}$ $T_{vj}=150^\circ\text{C}$	$t_{d\ on}$	34 37 40
上升时间 Rise time			t_r	153 157 163
关断延迟时间 Turn-off delay time				$t_{d\ off}$
下降时间 Fall time	t_f	67 68 73		
开通损耗能量 (每脉冲) Turn-on energy loss per pulse		E_{on}	4.28 4.35 4.57	
关断损耗能量 (每脉冲) Turn-off energy loss per pulse			E_{off}	1.08 1.12 1.20
结-外壳热阻 IGBT thermal resistance, junction	R_{thJC}			0.38
在开关状态下温度 Temperature under switching conditions	$T_{vj\ op}$	-40		175

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	$T_{vj}=25^\circ\text{C}$	V_{RRM}	650	V
连续正向直流电流 Continuous DC forward current	$T_C=100^\circ\text{C}, T_{vj\ max}=175^\circ\text{C}$	I_F	60	A
正向重复峰值电流 Repetitive peak forward current	$t_p=1\text{ ms}$	I_{FRM}	120	A

特征值 / Characteristic Values

Parameter	Conditions	Symbol	Value			Unit
			Min.	Typ.	Max.	
正向电压 Forward voltage	$I_F=75A, V_{GE}=0V$ $I_F=75A, V_{GE}=0V$ $I_F=75A, V_{GE}=0V$	$T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$ $T_{vj}=150^{\circ}C$	V_F	1.48 1.61 1.62	2.0	V
反向恢复峰值电流 Peak reverse recovery current	$I_F=75A,$ $-di_F/dt=462A/\mu s(T_{vj}=150^{\circ}C)$ $V_R=400V, V_{GE}=-15V$	$T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$ $T_{vj}=150^{\circ}C$	I_{RM}	17 23 25		A
反向恢复电荷 Reverse Recovered charge	$I_F=75A,$ $-di_F/dt=462A/\mu s(T_{vj}=150^{\circ}C)$ $V_R=400V, V_{GE}=-15V$	$T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$ $T_{vj}=150^{\circ}C$	Q_{rr}	2.43 3.37 3.72		μC
反向恢复时间 Reverse Recovery Time	$I_F=75A,$ $-di_F/dt=462A/\mu s(T_{vj}=150^{\circ}C)$ $V_R=400V, V_{GE}=-15V$	$T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$ $T_{vj}=150^{\circ}C$	t_{rr}	200 211 227		ns
反向恢复损耗（每脉冲） Reverse recovered energy	$I_F=75A,$ $-di_F/dt=462A/\mu s(T_{vj}=150^{\circ}C)$ $V_R=400V, V_{GE}=-15V$	$T_{vj}=25^{\circ}C$ $T_{vj}=125^{\circ}C$ $T_{vj}=150^{\circ}C$	E_{rec}	0.68 0.91 0.99		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	$^{\circ}C$

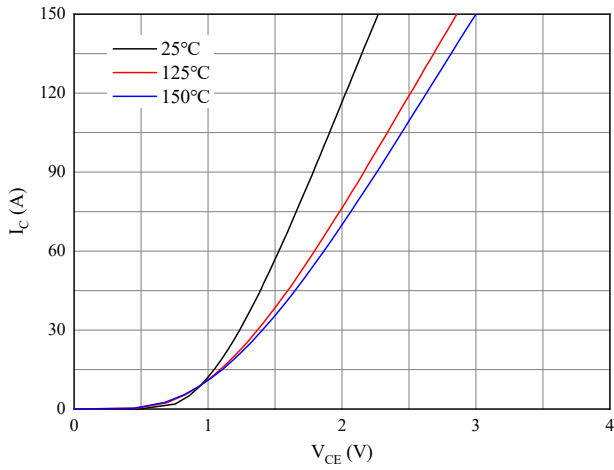


图 1. 典型输出特性 ($V_{GE}=15V$)

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

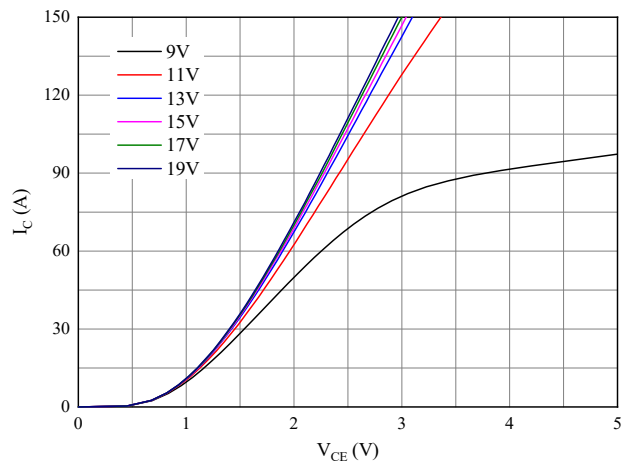


图 2. 典型输出特性 ($T_{vj}=150^{\circ}C$)

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

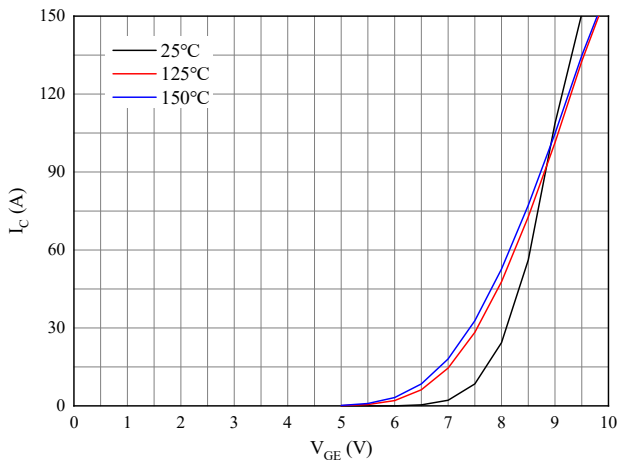


图 3. 典型传输特性 ($V_{CE}=20V$)

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

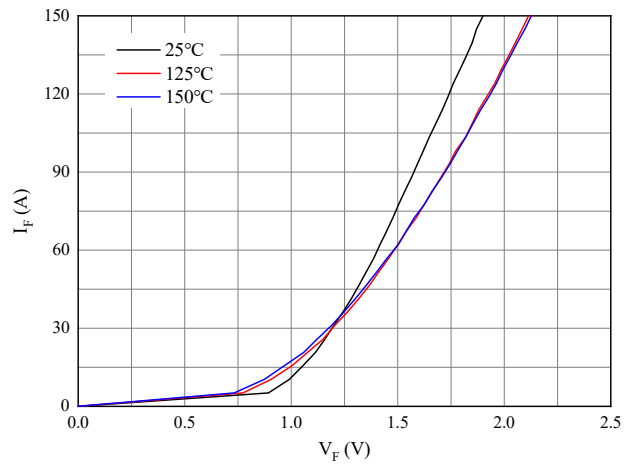


图 4. 正向偏压特性 二极管

Figure 4. Forward characteristic of Diode

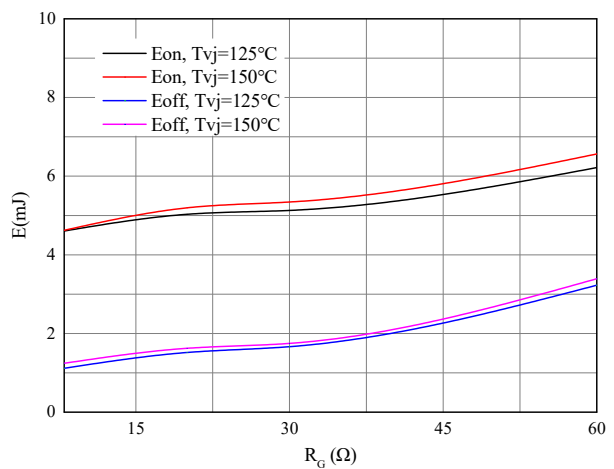
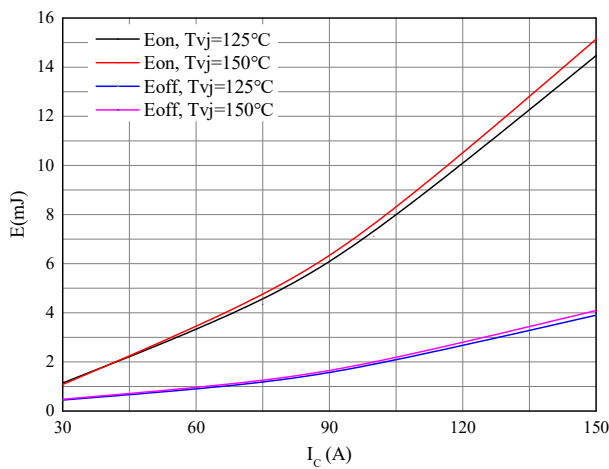


图 5. 开关损耗

Figure 5. Switching losses of IGBT

VGE=±15V, RGon=8Ω, Rgoff=8Ω, VCE=400V

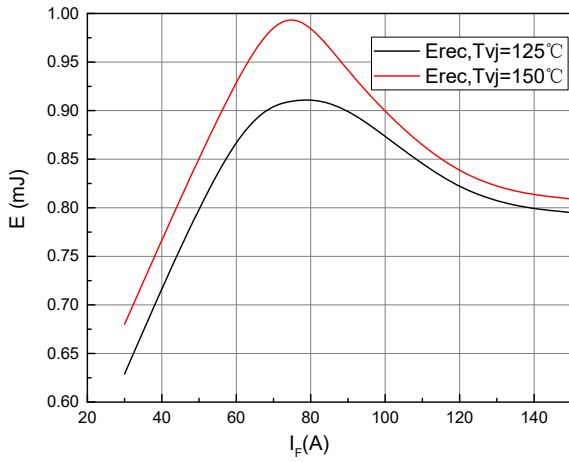


图 7. 开关损耗 二极管

Figure 7. Switching losses of Diode

Rgon=8Ω, VCE=400V

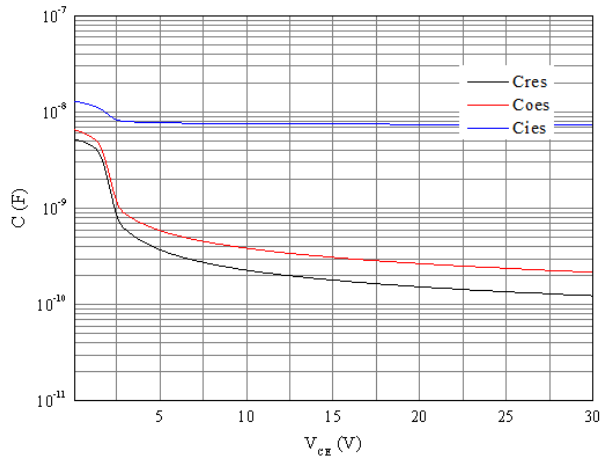


图 9. 电容特性

Figure 9. Capacitance characteristic

图 6. 开关损耗

Figure 6. Switching losses of IGBT

VGE=±15V, IC=75A, VCE=400V

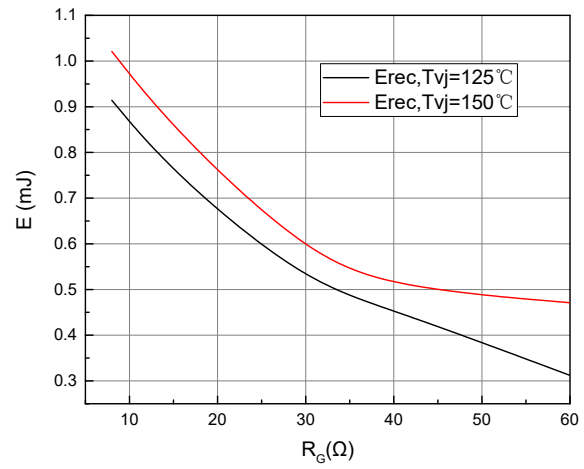
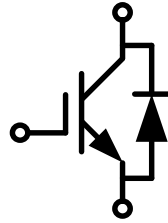


图 8. 开关损耗 二极管

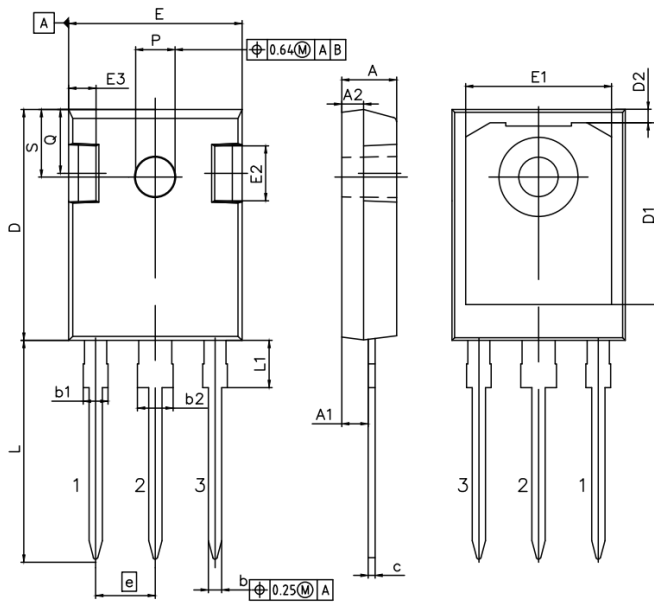
Figure 8. Switching losses of Diode

IF=75A, VCE=400V

接线图 / Circuit diagram



封装尺寸 / Package outlines



DIMENSIONS	MILLIMETERS	
	MIN.	MAX.
A	4.70	5.30
A1	2.20	2.60
A2	1.50	2.50
b	1.00	1.40
b1	1.60	2.41
b2	2.57	3.43
c	0.38	0.89
D	20.70	21.50
D1	13.08	17.65
D2	0.51	1.35
E	15.50	16.30
E1	12.38	14.15
E2	3.40	5.10
E3	1.00	2.60
e	5.44	
L	19.80	20.40
L1	3.85	4.50
P	3.50	3.70
Q	5.35	6.25
S	6.04	6.30