**IGBT** **Module/IGBT** **模块**

# HSFF300R17F2GF1

**Features/特性**

* 1700V,300A
* 采用SPT+技术的低VCE(sat)

Low VCE(sat) with SPT+ technology

* 具有正温度系数的VCE(sat)

VCE(sat) with positive temperature coefficient

* 包括快速软恢复反并联前馈

Including fast & soft recovery anti-parallel FWD

* 高短路能力（10us）

High short circuit capability(10us)

* 低电感模块结构

Low inductance module structure

**Mechanical** **Features/机械特性**

绝缘的基板 Isolated Base Plate标准封装

Standard Housing

**IGBT** **Power** **Module**

**Applications/应用**

* 电机驱动逆变器

Inverter for motor drive

* 交流和直流伺服驱动放大器

AC and DC servo drive amplifier

* 不间断电源

UPS (Uninterruptible Power Supplies)

* 光伏储能

Photovoltaic energy storage

* 高频开关应用

High Frequency Switching application

**Equivalent** **Circuit** **Schematic/等效电路图**

**Hanssemi.com.cn** **1** **Preliminary** **Datasheet**

**IGBT-Absolute** **Maximum** **Ratings** **(@** **TC** **=** **25°C** **unless** **otherwise** **specified)**

# HSFF300R17F2GF1



|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Parameter** | **Value** | **Units** |
| VCES | Collector-Emitter Voltage集电极-发射极电压 | 1700 | V |
| VGES | Gate-Emitter Peak Voltage栅极-发射极峰值电压 | ±20 | V |
| IC | Continuous Collector Current连续集电极直流电流 | TC = 100°C | 300 |  |
| ICM | Pulsed Collector Current集电极重复峰值电流 | tp=1ms | 600 | A |
| Ptot | Total Power Dissipation总功率功耗 | Tvj max = 150°C | 1800 | W |

**IGBT** **Characteristics** **(@** **TC** **=** **25°C** **unless** **otherwise** **specified)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Symbol** | **Parameter** | **Conditions** | **Min.** | **Typ.** | **Max.** | **Unit** |
| VCE sat | Collector to Emitter Saturation Voltage集电极-发射极饱和电压 | IC = 300 A, VGE = 15 V | Tvj=25℃ |  | 2.5 |  | V |
| Tvj=125℃ |  | 3.1 |  |  |
| VGE th | Gate-Emitter Threshold Voltage栅极阈值电压 | IC = 1.0 mA, VCE = VGE, Tvj = 25°C |  | 5.0 |  | V |
| ICES | Collector-Emitter Cut-off Current集电极-发射机截止电流 | VCE = 1700 V, VGE = 0 V, Tvj = 25°C |  |  | 1.0 | mA |
| IGES | Gate-emitter Leakage Current栅极-发射极漏电流 | VCE = 0 V, VGE = 20 V, Tvj = 25°C |  |  | 100 | nA |
| RGint | Internal Gate Resistor内部栅极电阻 |  |  | 3.0 |  | Ω |
| QG | Gate Charge栅极电荷 | VGE=-15…+15V |  | 1378 |  | μC |
| Cies | Input Capacitance输入电容 | VCE=25V,f=1MHz, VGE=0V |  | 22.5 |  | nF |
| Cres | Reverse Transfer Capacitance反向传输电容 |  | 0.5 |  | nF |
| tdon | Turn-on Delay Time开通延迟时间 | VCE=900V,IC=300A, RG=15Ω,VGE=±15V | Tvj=25℃ |  | 346 |  | nS |
| Tvj=125℃ |  | 366 |  |
| tr | Rise Time上升时间 | Tvj=25℃ |  | 301 |  | nS |
| Tvj=125℃ |  | 354 |  |
| tdoff | Turn-off Delay Time关断延迟时间 | Tvj=25℃ |  | 346 |  | nS |
| Tvj=125℃ |  | 382 |  |
| tf | Fall Time下降时间 | Tvj=25℃ |  | 170 |  | nS |
| Tvj=125℃ |  | 237 |  |
| Eon | Turn-On Switching Loss Per Pulse开通损耗能量 | Tvj=25℃ |  | 126 |  | mJ |
| Tvj=125℃ |  | 147 |  |
| Eoff | Turn-off Energy Loss Per Pulse关断损耗能量 | Tvj=25℃ |  | 31 |  | mJ |
| Tvj=125℃ |  | 42 |  |
| Isc | SC Data短路数据 | VGE = 15 V, Vcc = 900V, tp ≤ 10 μsVCEM ≤ 1200V, Tvj = 150℃ |  | 897 |  | A |
| RthJC | Thermal Resistance,Junction to Case结-外壳热阻 | per IGBT |  |  | 0.083 | K/W |
| RthCH | Thermal Resistance,Case to Heatsink外壳-散热器热阻 | per IGBT |  | 0.033 |  | K/W |

**Diode-Absolute** **Maximum** **Ratings** **(@** **TC** **=** **25°C** **unless** **otherwise** **specified)**

# HSFF300R17F2GF1



|  |  |  |  |
| --- | --- | --- | --- |
| **Symbol** | **Parameter** | **Value** | **Units** |
| VRRM | Repetitive Peak Reverse Voltage反向重复峰值电压 | 1700 | V |
| IF | Diode Continuous Forward Current连续正向直流电流 | 300 |  |
| IFM | Diode Maximum Forward Current正向重复峰值电流 | tp=1ms | 600 | A |

**Diode** **Characteristics** **(@** **TC** **=** **25°C** **unless** **otherwise** **specified)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Symbol** | **Parameter** | **Conditions** | **Min.** | **Typ.** | **Max.** | **Unit** |
| VF | Diode Forward Voltage正向电压 | IC = 300 A | Tvj=25℃ |  | 2.2 |  | V |
| Tvj=125℃ |  | 2.4 |  |
| Qr | Recovered Charge恢复电荷 | IF = 300A, VR = 900 V， RG = 15 Ω, VGE = -15 V | Tvj=25℃ |  | 33 |  | μC |
| Tvj=125℃ |  | 53 |  |
| Irm | Peak Reverse Recovery Current反向恢复峰值电流 | Tvj=25℃ |  | 99 |  | A |
| Tvj=125℃ |  | 118 |  |
| trr | Reverse Recovery Time反向恢复时间 | Tvj=25℃ |  | 562 |  | nS |
| Tvj=125℃ |  | 753 |  |
| Erec | Reverse Recovery Energy反向恢复损耗 | Tvj=25℃ |  | 14 |  | mJ |
| Tvj=125℃ |  | 22 |  |
| RthJC | Thermal Resistance,Junction to Case结-外壳热阻 | per Diode |  |  | 0.13 | K/W |
| RthCH | Thermal Resistance,Case to Heatsink结-散热器热阻 | per Diode |  | 0.051 |  | K/W |

# HSFF300R17F2GF1

**Module**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Symbol** | **Parameter** | **Conditions** | **Min.** | **Typ.** | **Max.** | **Unit** |
| VISOL | Isolation Test Voltage绝缘测试电压 | RMS, f = 50 Hz, t = 1 min | 2500 |  |  | V |
| Tvj max | Maximum Junction Temperature最大结温 |  |  |  | 150 | ℃ |
| Tvj op | Operating Junction Temperature工作结温 |  | -40 |  | 150 | ℃ |
| TSTG | Storage Temperature Range储存温度 |  | -40 |  | 125 | ℃ |
| RthCH | Case to Heatsink外壳-散热器热阻 | per Module |  | 0.01 |  | K/W |
| Ms | Mounting Torque For Modul Mounting模块安装的安装扭矩 | Recommended(M6) | 3 |  | 6 | Nm |
| Mt | Terminal Connection Torque端子连接扭矩 | Recommended(M5) | 2.5 |  | 5 | Nm |
| G | Weight重量 |  |  | 322 |  | g |

# HSFF300R17F2GF1

输🎧特性IGBT,逆变器（典型)

output characteristic IGBT,Inverter (typical) IC=f(VCE)

VGE=15V

输🎧特性IGBT,逆变器（典型)

output characteristic IGBT,Inverter (typical) IC=f(VCE)

Tvj=125°C

600

500

400

25℃

125℃

600

500

400

VGE=9V VGE=11V VGE=13V VGE=15V VGE=17V VGE=19V

300 300

IC[A]

IC[A]

200 200

100 100

0

0 1 2 3 4 5 6

VCE[V]

0

0 1 2 3 4 5 6

VCE[V]

传输特性IGBT,逆变器(典型)

transfer characteristic IGBT,Inverter(typical) IC=f(VGE)

VCE=20V

开关损耗IGBT,逆变器（典型) switching losses IGBT,Inverter(typical) Eon=f(RG),Eoff=f(RG) VGE=±15V,IC=300A,VCE=600V

600

500

400

300

IC[A]

200

100

0

25℃

125℃

5 8 11 14

VGE[V]

190

170

150

130

110

E[mJ]

90

70

50

30

10

Eon,Tvj=25℃ Eoff,Tvj=25℃ Eon,Tvj=25℃ Eoff,Tvj=125℃

0 5 10 15 20

RG[Ω]

# HSFF300R17F2GF1

瞬态热阻抗IGBT,逆变器

transient thermal impedance IGBT,Inverter ZthJC=f(t)

开关损耗二极管,逆变器（典型) switching losses Diode,Inverter(typical) Erec=f(RG)

IF=300A,VCE=600V

50

Erec,Tvj=25℃

Erec,Tvj=125℃

45

40

35

30

E[mJ]

25

20

15

10

5

0

0 5 10 15 20

RG[Ω]

正向偏压特性二极管,逆变器（典型)

forward characteristic of Diode, Inverter(typical) IF=f(VF)

瞬态热阻抗二极管,逆变器

transient thermal impedance Diode,Inverter ZthJC=f(t)

600

500

25℃

125℃

400

300

IF[A]

200

100

0

0 1 2 3 4

VF[V]

# HSFF300R17F2GF1

接线图**/circuit\_diagram\_headline**

封装尺寸/package outlines