HSG20N65LJ

IGBT

Features/特性

 650V，20A

 VCE(sat)(typ.)=2.0V @VGE=15V,IC=20A

 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

 快开关速度

High speed switching

Applications/应用

 不间断电源

Uninterruptible power supply

 电机驱动逆变器

Inverter for motor drive

 交、直流伺服驱动放大器

AC and DC servo drive amplifier

Equivalent Circuit Schematic/等效电路图

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

C

Symbol

VCES

Parameter

Value

650

Units

Collector-Emitter Voltage

集电极-发射极电压

Gate-Emitter Peak Voltage

栅极-发射极峰值电压

V

V

VGES

±30

DC collector current, limited by Tvjmax

集电极直流电流受最大结温限制

IC

T = 100°C

C

20

60

Α

Pulsed collector current, tp limited by Tvjmax

集电极脉冲电流脉宽受最大结温限制

ICM

A

T = 25°C

48

24

W

W

℃

C

Maximum Power Dissipation

最大耗散功率

Ptot

T = 100°C

C

Operating Junction Temperature

工作结温

TJ

-40 to 175

-55 to 175

Storage Temperature Range

储存温度

TSTG

℃

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

C

Symbol

Parameter

Conditions

Min.

Typ.

Max.

2.5

Unit

V

Collector to Emitter Saturation Voltage

集电极-发射极饱和电压

VCE sat

IC = 20 A, VGE = 15 V

2.0

Gate-Emitter Threshold Voltage

栅极阈值电压

VGE th

ICES

IGES

QG

IC = 250 uA, VCE = VGE

VCE = 650 V, VGE = 0 V

VCE = 0 V, VGE = ±20 V

4.0

6.0

V

Collector-Emitter Cut-off Current

集电极-发射机截止电流

100.0

±200

uA

nA

nC

nC

nC

nF

nF

nF

nS

nS

nS

nS

mJ

mJ

Gate-emitter Leakage Current

栅极-发射极漏电流

Gate Charge

栅极电荷

45

13

20

Gate-Emitter Charge

栅极-发射极电荷

V =520V,I =20A

CC

C

QGE

QGC

Cies

Coes

Cres

tdon

tr

V =15V

GE

Gate-Collector Charge

栅极-集电极电荷

Input Capacitance

输入电容

1040

47

Output Capacitance

输出电容

V =25V,f=1MHz,

CE

V =0V

GE

Reverse Transfer Capacitance

反向传输电容

20

Turn-on Delay Time

开通延迟时间

17

Rise Time

上升时间

30

Turn-off Delay Time

关断延迟时间

tdoff

tf

V =400V,I =20A,

72

CE

C

R =15Ω,V =15V

G

GE

Fall Time

下降时间

22

Turn-On Switching Loss Per Pulse

开通损耗能量

Eon

Eoff

0.5

0.2

Turn-off Energy Loss Per Pulse

关断损耗能量

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

C

Symbol

VRRM

IF

Parameter

Value

650

20

Units

Repetitive Peak Reverse Voltage

反向重复峰值电压

V

Α

A

Diode Continuous Forward Current

连续正向直流电流

T = 100°C

C

Diode maximum current, tp limited by Tvjmax

二极管最大电流，脉宽受最大结温限制

IFM

60

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

C

Symbol

Parameter

Diode Forward Voltage

Conditions

Min.

Typ.

Max.

Unit

VF

IF = 40 A

1.8

V

正向电压

Recovered Charge

恢复电荷

Qrr

Irr

863

24

nC

A

Peak Reverse Recovery Current

反向恢复峰值电流

IF = 40A, VCE = 400 V,

R =30Ω

G

Reverse Recovery Time

反向恢复时间

trr

65

nS

Thermal Characteristics

Symbol

Parameter

Thermal resistance, junction to case for IGBT

IGBT 结-外壳热阻

Min.

Typ.

Max.

Unit

RthJC

RthJC

RthJA

3.1

℃/W

Thermal resistance, junction to case for Diode

二极管 结-外壳热阻

℃/W

℃/W

3.8

63

Thermal resistance, junction to Ambient

结-环境热阻

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输出特性IGBT

传输特性IGBT

Typical output characteristic IGBT

I = f(V )

Tvj = 25 °C

Typical transfer characteristic IGBT

I = f(V )

C

CE

C GE

Tvj = 25 °C

VGE(V)

VCE(V)

开关损耗IGBT

电容

capacitance as a function of collector-emitter

voltage IGBT

output characteristic IGBT

Eon = f(R ) ,Eoff = f(R )

G

G

C = f(V ) ,f = 1MHz, VGE = 0 V

VGE=15V,IC=20A,VCE=400V

CE

Tvj = 25 °C

R (Ω)

G

V (V)

CE

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功耗

正向偏压二极管

Power dissipation as a function of case temperture

P =f(T )

Diode forward voltage as a function of

junction temperature

V =f(T )

D

C

F

C

TC(℃)

TC(℃)

开关损耗二极管

Switching losses Diode

Err = f(di/dt)

瞬态热阻抗

normalized transient thermal impedance,iunction to case

ZthJC=f(t)

V =15V,I =20A,V =400V

GE

C

CE

di/dt(A/us)

t, Pulse Width (s)

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封装尺寸/package outlines

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