STPSC10H065DLF Datasheet

https://www.DiGi-Electronics.com

DiGi Electronics Part Number	STPSC10H065DLF-DG
Manufacturer	STMicroelectronics
Manufacturer Product Number	STPSC10H065DLF
Description	DIODE SIL CARB 650V 10A PWRFLAT
Detailed Description	Diode 650 V 10A Surface Mount PowerFlat™ (8x8) HV

This model STPSC10H065DLF is available at DiGi Electronics.

DiGi Electronics offers a global database of semiconductor and electronic component datasheets.

We welcome your inquiries regarding pricing, lead time, or other product-related questions.

Request a Quote

Datasheet Search

Tel: +00 852-30501935

RFQ Email: Info@DiGi-Electronics.com

DiGi is a global authorized distributor of electronic components.

Purchase and inquiry

Manufacturer Product Number:	Manufacturer:
STPSC10H065DLF	STMicroelectronics
Series:	Product Status:
-	Active
Technology:	Voltage - DC Reverse (Vr) (Max):
SiC (Silicon Carbide) Schottky	650 V
Current - Average Rectified (Io):	Voltage - Forward (Vf) (Max) @ If:
10A	1.55 V @ 10 A
Speed:	Reverse Recovery Time (trr):
No Recovery Time > 500mA (Io)	0 ns
Current - Reverse Leakage @ Vr:	Capacitance @ Vr, F:
100 µA @ 650 V	595pF @ 0V, 1MHz
Mounting Type:	Package / Case:
Surface Mount	8-PowerVDFN
Supplier Device Package:	Operating Temperature - Junction:
PowerFlat™ (8x8) HV	-40°C ~ 175°C
Base Product Number:	
STPSC10	

Environmental & Export classification

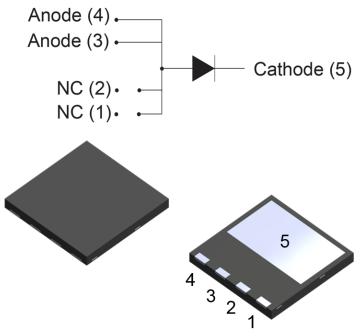
RoHS Status:	Moisture Sensitivity Level (MSL):
ROHS3 Compliant	1 (Unlimited)
REACH Status:	ECCN:
REACH Unaffected	EAR99
HTSUS:	
8541.10.0080	

life.augmented

STPSC10H065DLF

Datasheet

650 V, 10 A power Schottky silicon carbide diode



PowerFLAT 8x8 HV

STPOWER

Features

- Less than 1 mm height package
- High creepage package
- No or negligible reverse recovery
- Temperature independent switching behavior
- High forward surge capability
- Very low drop forward voltage
- Power efficient product
- ECOPACK2 compliant component

Applications

- Boost PFC
- Bootstrap diode
- LLC clamping function
- High frequency inverter applications

Description

This 10 A, 650 V, SiC diode is an ultra-high performance power Schottky diode. It is manufactured using a silicon carbide substrate. The wide band gap material allows the design of a Schottky diode structure with a 650 V rating. Due to the Schottky construction, no recovery is shown at turn-off and ringing patterns are negligible. The minimal capacitive turn-off behavior is independent of temperature.

Qualified in low profile package, the STPSC10H065DLF in PowerFLAT 8x8 HV, enables low drop forward voltage associated to high surge capabilities in low space environment such as telecom and network, industrial or renewable energy domains.

Product status link
STPSC10H065DLF

Product summary	
Symbol	**Value**
$I_{F(AV)}$	10 A
V_{RRM}	650 V
$V_{F(typ.)}$	1.38 V
$T_{j(max.)}$	175 °C

Product label
SUSTAINABLE TECHNOLOGY

1 Characteristics

Table 1. Absolute ratings (limiting values at 25 °C unless otherwise specified)

Symbol	Parameter		Value	Unit
V_{RRM}	Repetitive peak reverse voltage	T_j = -40 °C to + 175 °C	650	V
$I_{F(RMS)}$	Forward rms current		28	A
$I_{F(AV)}$	Average forward current	T_c = 125 °C(1), DC	10	A
I_{FSM}	Surge non repetitive forward current	t_p = 10 ms sinusoidal, T_c = 25 °C t_p = 10 ms sinusoidal, T_c = 125 °C t_p = 10 µs square, T_c = 25 °C	90 80 850	A
I_{FRM}	Repetitive peak forward current	T_c = 125 °C(1) , T_j = 175 °C, δ = 0.1, f_W > 10 kHz	42	A
T_{stg}	Storage temperature range		-55 to +175	°C
T_j	Operating junction temperature range		-40 to +175	°C

1. *Value based on $R_{th(j-c)}$ max.*

Table 2. Thermal resistance parameters

Symbol	Parameter	Typ. value	Max. value	Unit
$R_{th(j-c)}$	Junction to case	1.65	2.35	°C/W

Table 3. Static electrical characteristics

Symbol	Parameter	Test conditions		Min.	Typ.	Max.	Unit
I_R(1)	Reverse leakage current	T_j = 25 °C	$V_R = V_{RRM}$	-	9	100	µA
		T_j = 150 °C		-	85	425	
V_F(2)	Forward voltage drop	T_j = 25 °C	I_F = 10 A	-	1.38	1.55	V
		T_j = 150 °C		-	1.60	1.95	

1. *t_p = 10 ms, δ < 2%*
2. *t_p = 500 µs, δ < 2%*

To evaluate the conduction losses, use the following equation:

$P = 1.00 \times I_{F(AV)} + 0.095 \times I_F{}^2{}_{(RMS)}$

For more information, please refer to the following application notes related to the power losses:

- AN604 : Calculation of conduction losses in a power rectifier
- AN4021 : Calculation of reverse losses on a power diode

Table 4. Dynamic electrical characteristics

Symbol	Parameter	Test conditions	Typ.	Unit
Q_{cj}(1)	Total capacitive charge	V_R = 400 V	32	nC
C_j	Total capacitance	V_R = 0 V, T_c = 25 °C, F = 1 MHz	595	pF
		V_R = 400 V, T_c = 25 °C, F = 1 MHz	55	

1. *Most accurate value for the capacitive charge:*

$$Q_{cj}(V_R) = \int_0^{V_R} C_j(V)dV$$

1.1 Characteristics (curves)

Figure 1. Forward voltage drop versus forward current (typical values, low level)

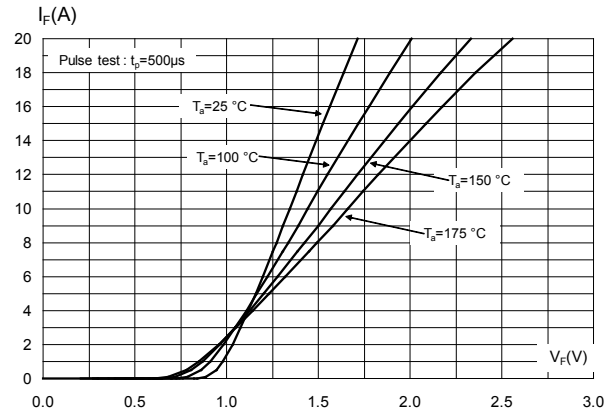


Figure 2. Forward voltage drop versus forward current (typical values, high level)

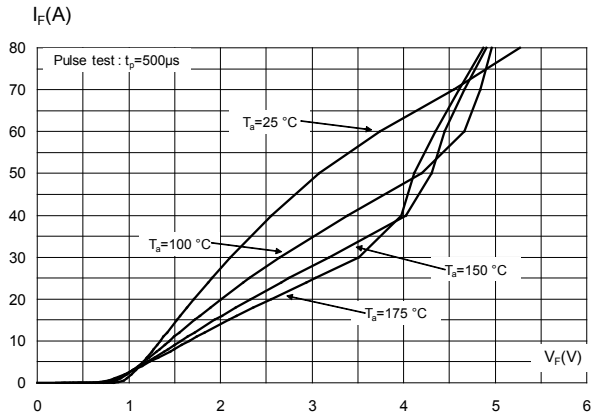


Figure 3. Reverse leakage current versus reverse voltage applied (typical values)

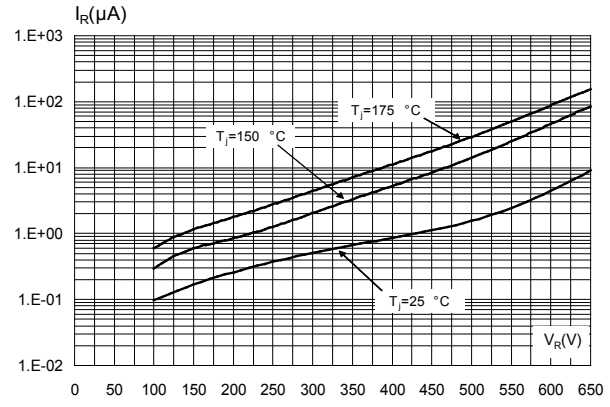


Figure 4. Peak forward current versus case temperature (fw > 10 kHz)

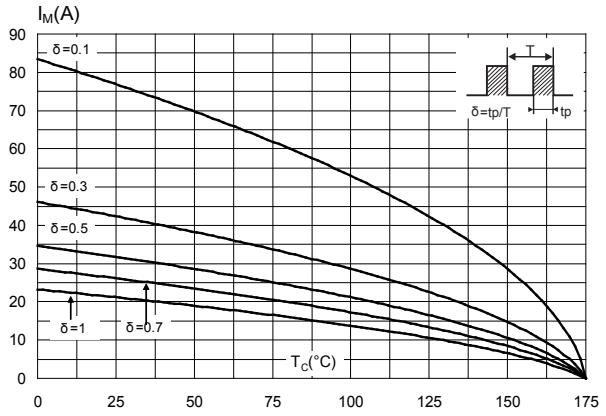


Figure 5. Junction capacitance versus reverse voltage applied (typical values)

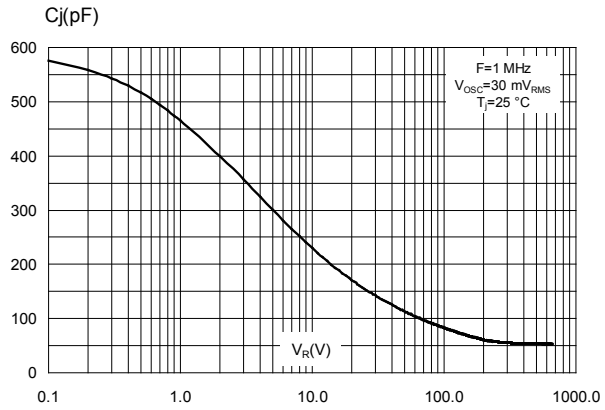


Figure 6. Relative variation of thermal impedance junction to case versus pulse duration

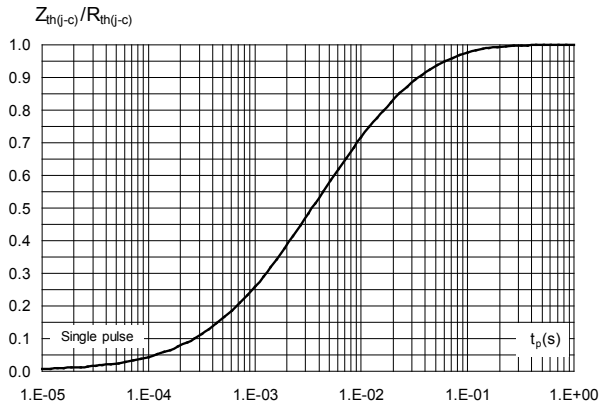


Figure 7. Non-repetitive peak surge forward current versus pulse duration (sinusoidal waveform)

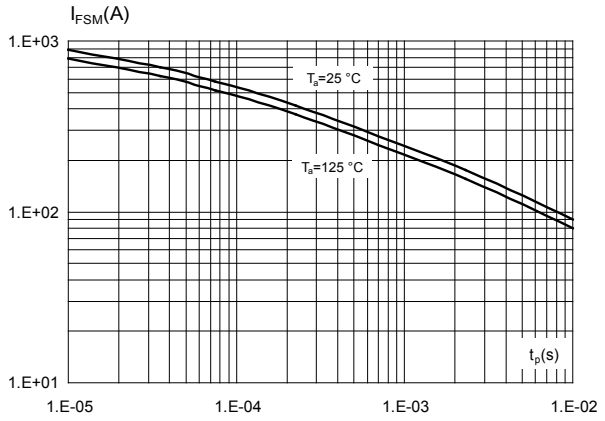


Figure 8. Total capacitive charges versus reverse voltage applied (typical values)

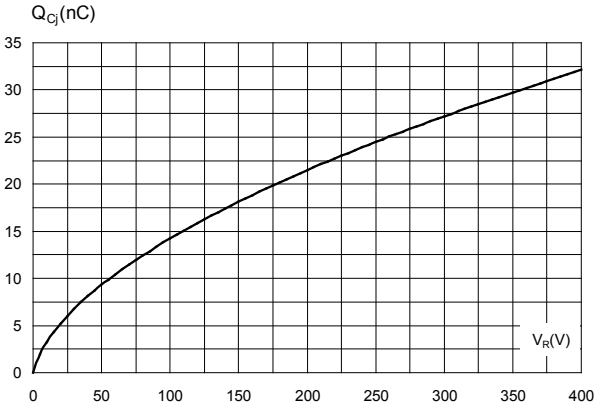
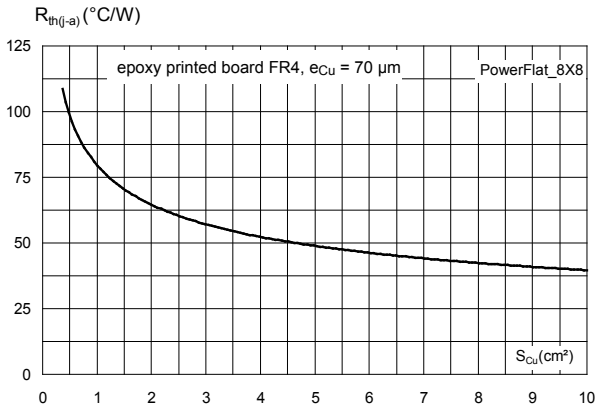


Figure 9. Thermal resistance junction to ambient versus copper surface under tab (typical values)



2 Package information

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK packages, depending on their level of environmental compliance. ECOPACK specifications, grade definitions and product status are available at: www.st.com. ECOPACK is an ST trademark.

2.1 PowerFLAT 8x8 HV package information

- Epoxy meets UL94, V0
- Lead-free Package

Figure 10. PowerFLAT 8x8 HV package outline

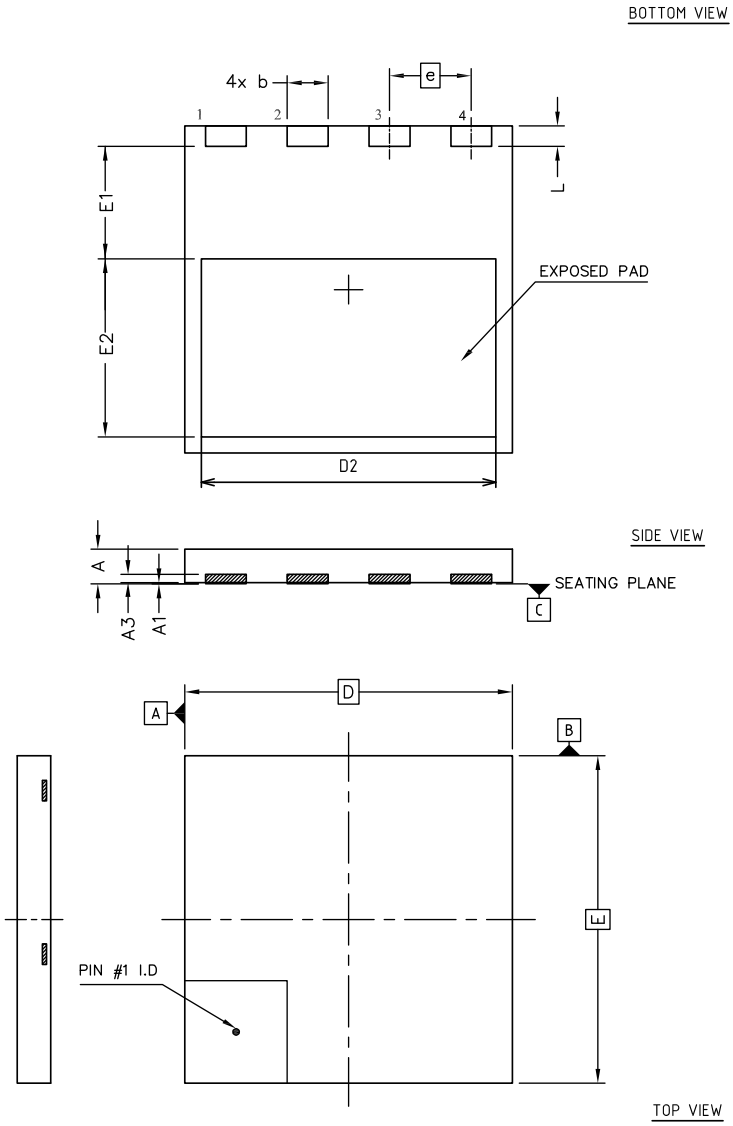
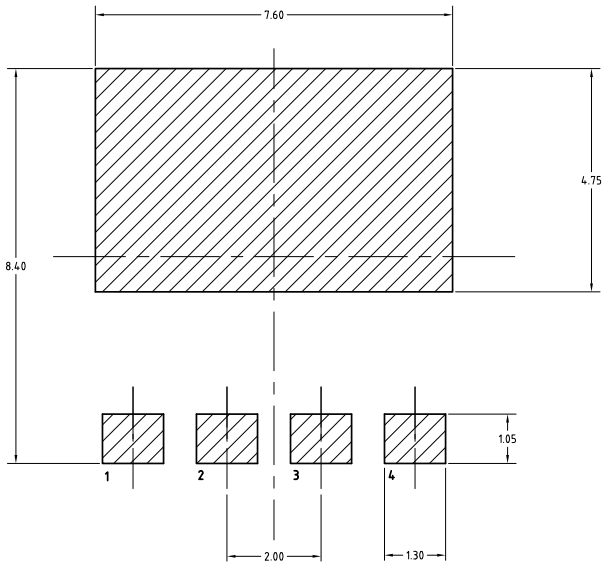


Table 5. PowerFLAT 8x8 HV mechanical data

Ref.	Dimensions (in mm)		
	Min.	Typ.	Max.
A	0.75	0.85	0.95
A1	0.00		0.05
A3	0.10	0.20	0.30
b	0.90	1.00	1.10
D	7.90	8.00	8.10
E	7.90	8.00	8.10
D2	7.10	7.20	7.30
E1	2.65	2.75	2.85
E2	4.25	4.35	4.45
e		2.00	
L	0.40	0.50	0.60

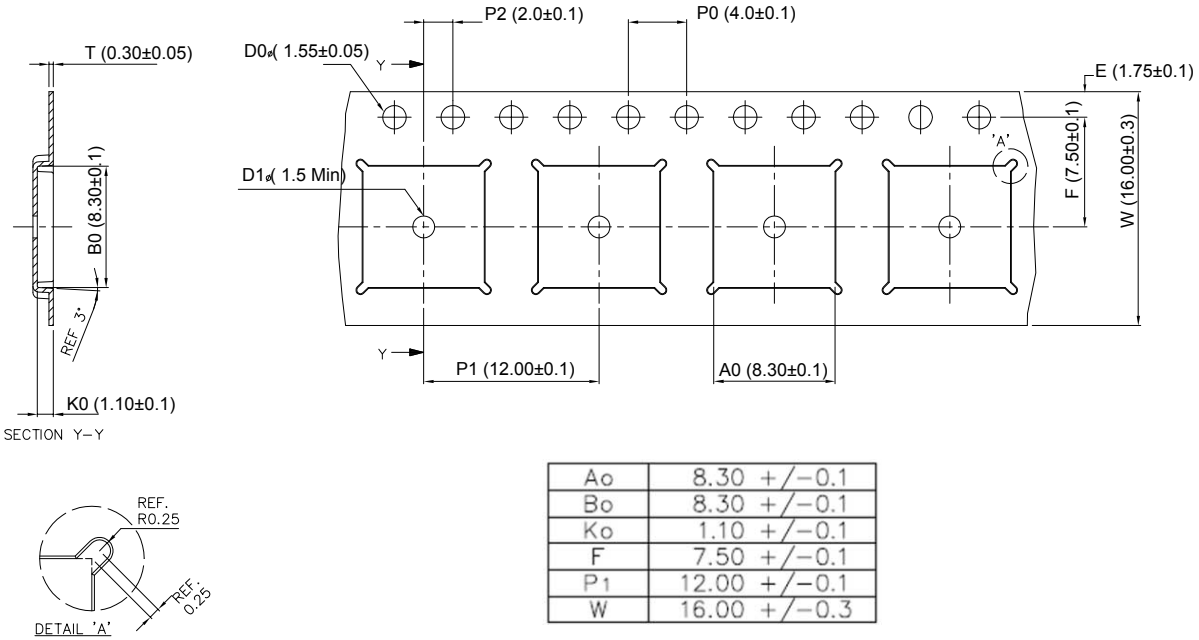
Figure 11. PowerFLAT 8x8 HV footprint



Note: All dimensions are in millimeters.

2.2 PowerFLAT 8x8 HV packing information

Figure 12. **PowerFLAT 8x8 HV tape**



Ao	8.30 +/−0.1
Bo	8.30 +/−0.1
Ko	1.10 +/−0.1
F	7.50 +/−0.1
P1	12.00 +/−0.1
W	16.00 +/−0.3

Note: All dimensions are in millimeters.

Figure 13. **PowerFLAT 8x8 HV package orientation in carrier tape**

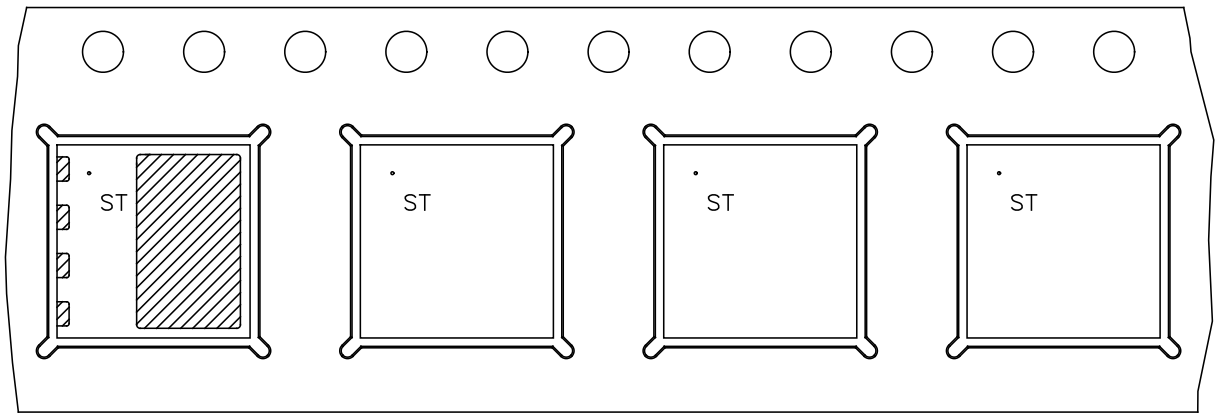
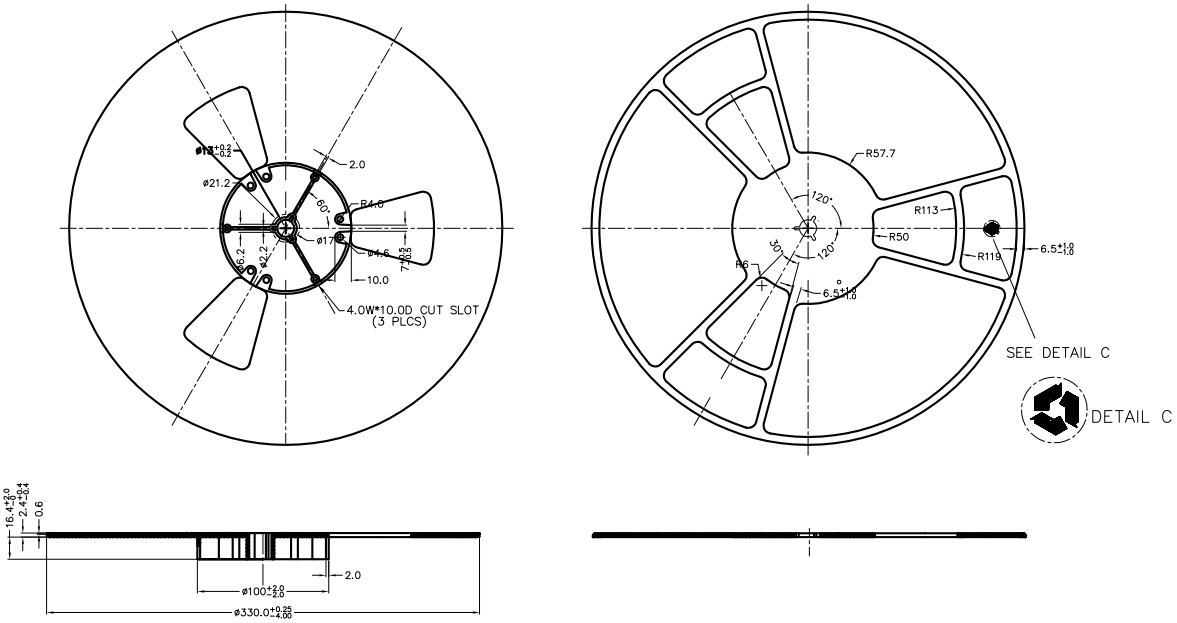


Figure 14. PowerFLAT 8x8 HV reel



Note: All dimensions are in millimeters.

3 Ordering Information

Table 6. Ordering information

Order code	Marking	Package	Weight	Base qty.	Delivery mode
STPSC10H065DLF	PSC10H065	PowerFLAT 8x8 HV	170 mg	3000	Reel

Revision history

Table 7. **Document revision history**

Date	Version	Changes
04-Dec-2019	1	Initial release.
31-Mar-2021	2	Inserted STPOWER logo and unpdated Table 6.

OUR CERTIFICATE

DiGi provide top-quality products and perfect service for customer worldwide through standardization, technological innovation and continuous improvement. DiGi through third-party certification, we striciy control the quality of products and services. Welcome your RFQ to Email: Info@DiGi-Electronics.com

Tel: +00 852-30501935

RFQ Email: Info@DiGi-Electronics.com

DiGi is a global authorized distributor of electronic components.