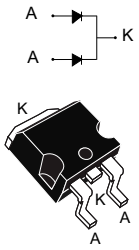
FERD60H100C-Y

Datasheet

100 V, 2 x 30 A field-effect rectifier diode



D²PAK

Features

- AEC-Q101 qualified
- PPAP capable
- Operating T_j from -40 °C to 175 °C
- ST patented rectifier process
- Stable leakage current over reverse voltage
- Low forward voltage drop
- High frequency operation
- ECOPACK compliant

Applications

- Battery charger
- DC / DC converter
- OBC (on-board battery charger)
- PHEV – EV charging station
- Resonant LLC topology
- PFC functions (power factor correction)

Product status link
FERD60H100C-Y

Product summary	
$I_{F(AV)}$	2 x 30 A
V_{RRM}	100 V
T_j (max.)	175 °C
V_F (typ.)	0.64 V

Product label
SUSTAINABLE TECHNOLOGY

Description

The FERD60H100C-Y is based on proprietary technology that achieves the best in class V_F/I_R trade-off for a given silicon surface.

This 100 V automotive diode has been optimized for use in confined applications where both efficiency and thermal performance are key parameters.

This device is suitable to be used in DCDC converter by improving the efficiency.

1 Characteristics

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

Symbol	Parameter			Value	Unit
V_{RRM}	Repetitive peak reverse voltage (T_j = -40 °C to +175 °C)			100	V
$I_{F(RMS)}$	Forward rms current			60	A
$I_{F(AV)}$	Average forward current	T_c = 145 °C, δ = 0.5	Per diode	30	A
			Per device	60	
I_{FSM}	Surge non repetitive forward current		t_p = 10 ms sinusoidal	290	A
T_{stg}	Storage temperature range			-65 to +175	°C
T_j	Operating junction temperature range			-40 to +175	°C

Table 2. Thermal resistance parameters

Symbol	Parameter		Value		Unit
			Typ.	Max.	
$R_{th(j-c)}$	Junction to case	Per diode	0.60	1.06	°C/W
		Per device	0.30	0.53	

For more information, please refer to the following application note:

- AN5088: Rectifiers thermal management, handling and mounting recommendations

Table 3. Static electrical characteristics (per diode)

Symbol	Parameter	Test conditions		Typ.	Max.	Unit
I_R (1)	Reverse leakage current	T_j = 25 °C	$V_R = V_{RRM}$		60	µA
		T_j = 125 °C			10	mA
		T_j = 125 °C	V_R = 70 V		5	mA
V_F (2)	Forward voltage drop	T_j = 25 °C	I_F = 5 A	0.46	0.52	V
		T_j = 125 °C		0.41	0.45	
		T_j = 25 °C	I_F = 15 A	0.62	0.70	
		T_j = 125 °C		0.56	0.61	
		T_j = 25 °C	I_F = 30 A	0.75	0.85	
		T_j = 125 °C		0.64	0.70	
		T_j = 25 °C	I_F = 60 A	0.92		
		T_j = 125 °C		0.76		

1. *Pulse test: t_p = 5 ms, δ < 2%*
2. *Pulse test: t_p = 380 µs, δ < 2%*

To evaluate the conduction losses, use the following equation: $P = 0.55 \times I_{F(AV)} + 0.005 \times I_F{}^2{}_{(RMS)}$

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

1.1 Characteristics (curves)

Figure 1. Average forward current versus case temperature (δ = 0.5, per diode)

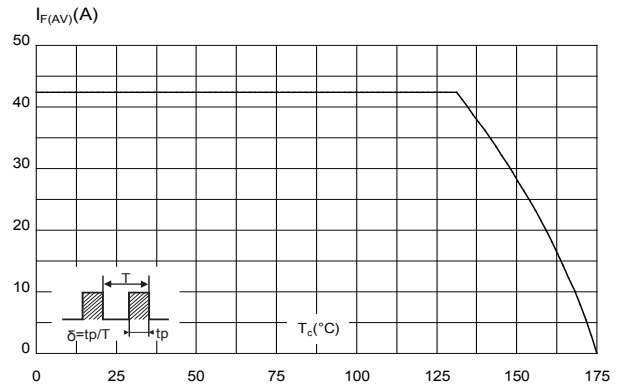


Figure 2. Relative variation of thermal impedance junction to case versus pulse duration

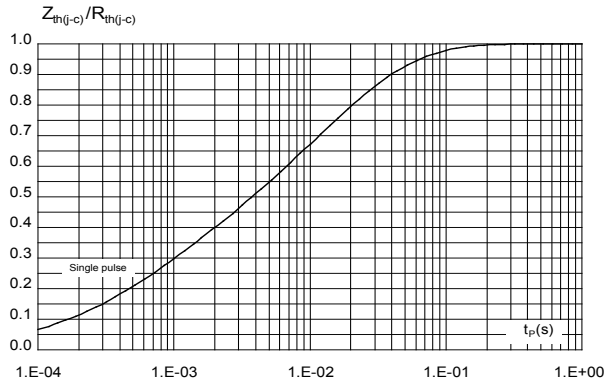


Figure 3. Reverse leakage current versus reverse voltage applied (typical values, per diode)

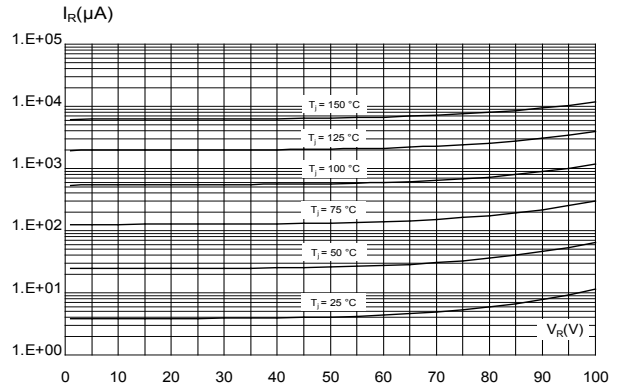


Figure 4. Junction capacitance versus reverse voltage applied (typical values, per diode)

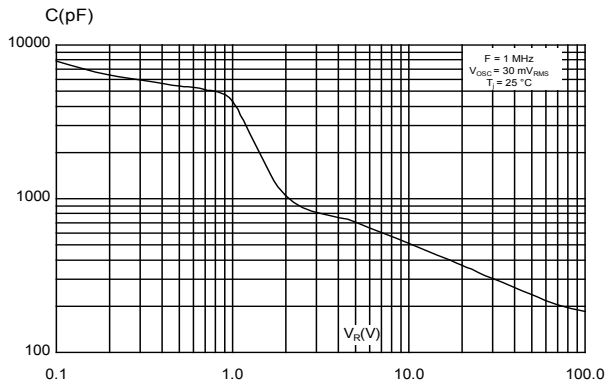


Figure 5. Forward voltage drop versus forward current (typical values, per diode)

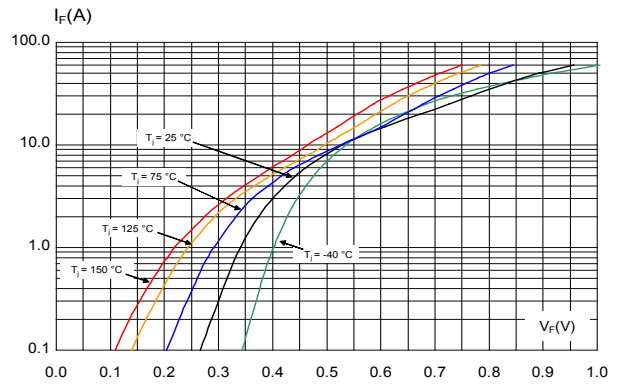
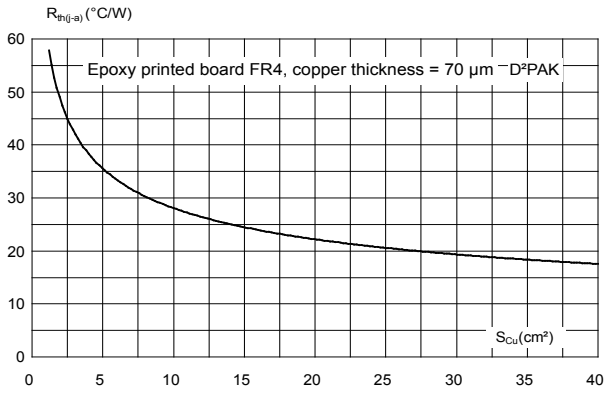


Figure 6. Thermal resistance junction to ambient versus copper surface under tab (typical values)



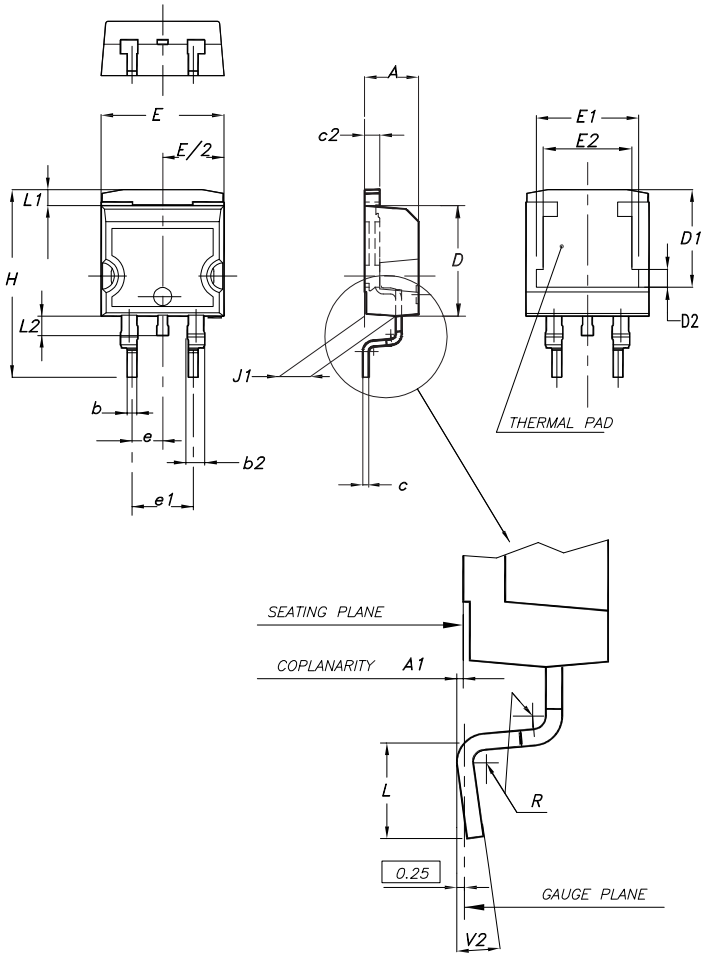
2 Package information

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 D²PAK package information

- Epoxy meets UL94, V0.
- Cooling method: by conduction (C)

Figure 7. D²PAK package outline

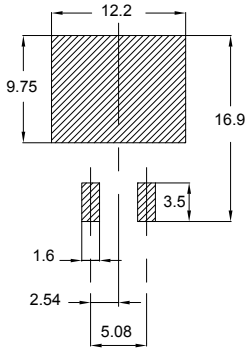


Note: This package drawing may slightly differ from the physical package. However, all the specified dimensions are guaranteed.

Table 4. **D²PAK package mechanical data**

Ref.	Dimensions					
	Millimeters			Inches (for reference only)		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.40		4.60	0.173		0.181
A1	0.03		0.23	0.001		0.009
b	0.70		0.93	0.028		0.037
b2	1.14		1.70	0.045		0.067
c	0.45		0.60	0.018		0.024
c2	1.23		1.36	0.048		0.053
D	8.95		9.35	0.352		0.368
D1	7.50	7.75	8.00	0.295	0.305	0.315
D2	1.10	1.30	1.50	0.043	0.051	0.060
E	10.00		10.40	0.394		0.409
E1	8.30	8.50	8.70	0.335	0.343	0.346
E2	6.85	7.05	7.25	0.266	0.278	0.282
e		2.54			0.100	
e1	4.88		5.28	0.190		0.205
H	15.00		15.85	0.591		0.624
J1	2.49		2.69	0.097		0.106
L	2.29		2.79	0.090		0.110
L1	1.27		1.40	0.049		0.055
L2	1.30		1.75	0.050		0.069
R		0.40			0.015	
V2	0°		8°	0°		8°

Figure 8. **D²PAK recommended footprint (dimensions are in mm)**



3 Ordering information

Table 5. **Ordering information**

Order code	Marking	Package	Weight	Base qty.	Delivery mode
FERD60H100CGY-TR	FD60H100CGY	D²PAK	1.38 g	1000	Tape and reel

Revision history

Table 6. **Document revision history**

Date	Revision	Changes
25-Mar-2021	1	First issue.
06-Apr-2021	2	Updated Features and Applications.