

1. General description

WeEn's 5th Generation Hyper Fast diode with softer recovery in a 2-lead ITO220 plastic package.

2. Features and benefits

- Isolated mounting base with 2500 V (RMS) isolation
- Low leakage current
- Low reverse recovery current
- Low thermal resistance
- Soft reverse recovery with low recovery current
- Reduces switching losses in associated MOSFET or IGBT

3. Applications

- Active PFC in air conditioner
- Continuous Current Mode (CCM) Power Factor Correction (PFC)
- Half-bridge/full-bridge switched-mode power supplies

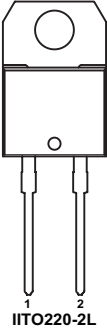
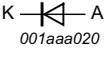
4. Quick reference data

Table 1. Quick reference data

Symbol	Parameter	Conditions	Notes	Values			Unit
Absolute maximum rating							
V_{RRM}	repetitive peak reverse voltage			600			V
$I_{F(AV)}$	average forward current	$\delta = 0.5$; square-wave pulse; Fig. 1 ; Fig. 2 ; Fig. 3		30			A
I_{FRM}	repetitive peak forward current	$\delta = 0.5$; $t_p = 25 \mu s$; square-wave pulse		60			A
I_{FSM}	non-repetitive peak forward current	$t_p = 10 ms$; $T_{j(imit)} = 25 \text{ }^\circ C$; sine-wave pulse; Fig. 4		260			A
		$t_p = 8.3 ms$; $T_{j(imit)} = 25 \text{ }^\circ C$; sine-wave pulse		286			A
Symbol	Parameter	Conditions	Notes	Min	Typ	Max	Unit
Static characteristics							
V_F	forward voltage	$I_F = 30 A$; $T_j = 25 \text{ }^\circ C$; Fig. 6		-	2.00	2.75	V
Dynamic characteristics							
t_{rr}	reverse recovery time	$I_F = 1 A$; $V_R = 30 V$; $di_F/dt = 50 A/\mu s$; $T_j = 25 \text{ }^\circ C$; Fig. 7		-	-	45	ns

5. Pinning information

Table 2. Pinning information

Pin	Symbol	Description	Simplified outline	Graphic symbol
1	K	cathode		
2	A	anode		
mb	n.c.	mounting base; isolated		

6. Ordering information

Table 3. Ordering information

Type number	Package Name	Orderable part number	Packing method	Small packing quantity	Package version	Package issue date
BYC30Y-600PS	IITO220-2L	BYC30Y-600PSQ	Tube	50	IITO220E-2L	03-Mar-2020

7. Marking

Table 4. Marking codes

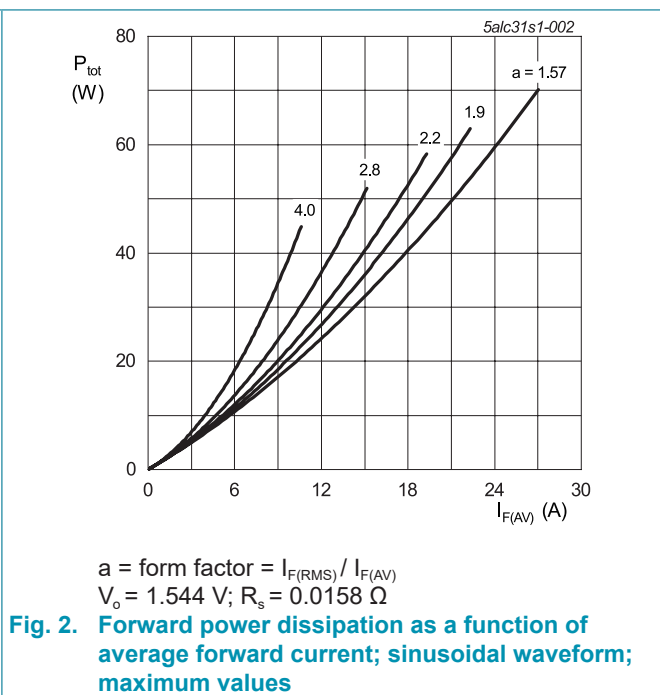
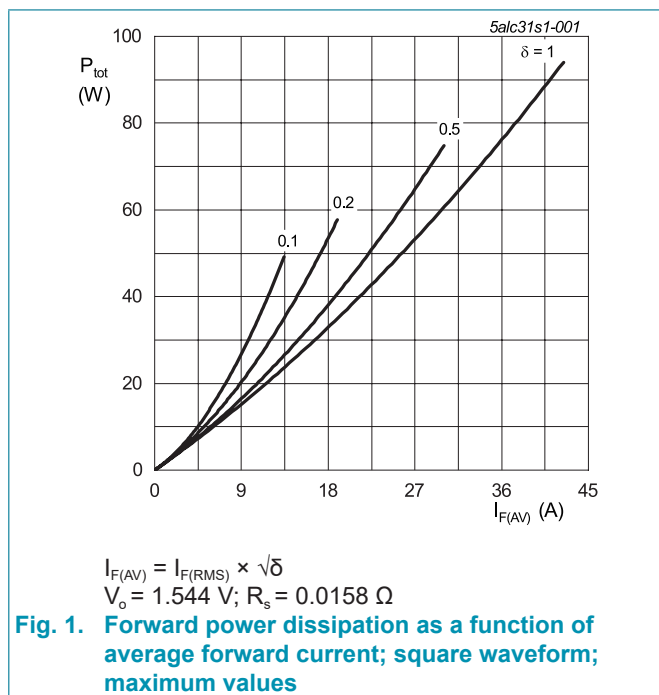
Type number	Marking codes
BYC30Y-600PS	BYC30Y 600PS

8. Limiting values

Table 5. Limiting values

In accordance with the Absolute Maximum Rating System (IEC 60134).

Symbol	Parameter	Conditions	Notes	Values	Unit
V_{RRM}	repetitive peak reverse voltage			600	V
V_{RWM}	crest working reverse voltage			600	V
V_R	reverse voltage	DC		600	V
$I_{F(AV)}$	average forward current	$\delta = 0.5$; square-wave pulse; Fig. 1 ; Fig. 2 ; Fig. 3		30	A
I_{FRM}	repetitive peak forward current	$\delta = 0.5$; $t_p = 25 \mu s$; square-wave pulse		60	A
I_{FSM}	non-repetitive peak forward current	$t_p = 10 \text{ ms}$; $T_{j(\text{init})} = 25 \text{ }^\circ\text{C}$; sine-wave pulse; Fig. 4		260	A
		$t_p = 8.3 \text{ ms}$; $T_{j(\text{init})} = 25 \text{ }^\circ\text{C}$; sine-wave pulse		286	A
T_{stg}	storage temperature			-65 to 175	$^\circ\text{C}$
T_j	junction temperature			-65 to 175	$^\circ\text{C}$



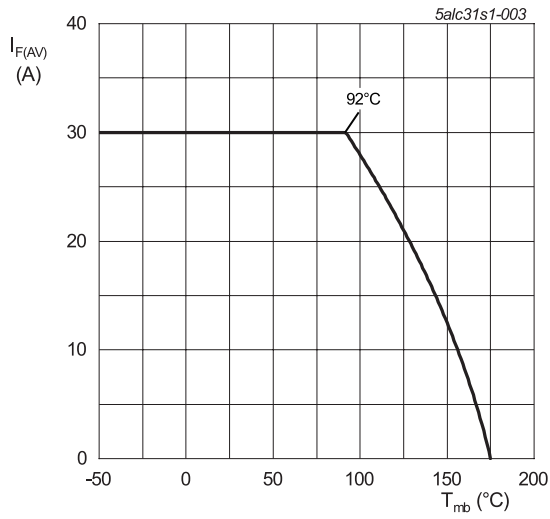


Fig. 3. Forward current as a function of mounting base temperature; typical values

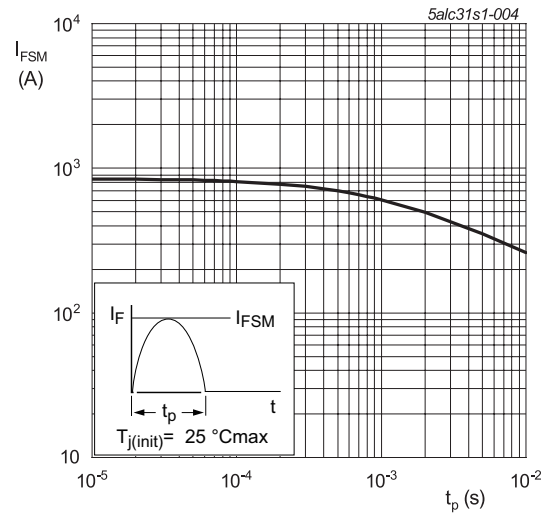


Fig. 4. Non-repetitive peak forward current as a function of pulse width; sinusoidal waveform; maximum values

9. Thermal characteristics

Table 6. Thermal characteristics

Symbol	Parameter	Conditions	Notes	Min	Typ	Max	Unit
$R_{th(j-mb)}$	thermal resistance from junction to mounting base	with heatsink compound; Fig. 5		-	-	2.1	K/W
$R_{th(j-a)}$	thermal resistance from junction to ambient	in free air		-	60	-	K/W

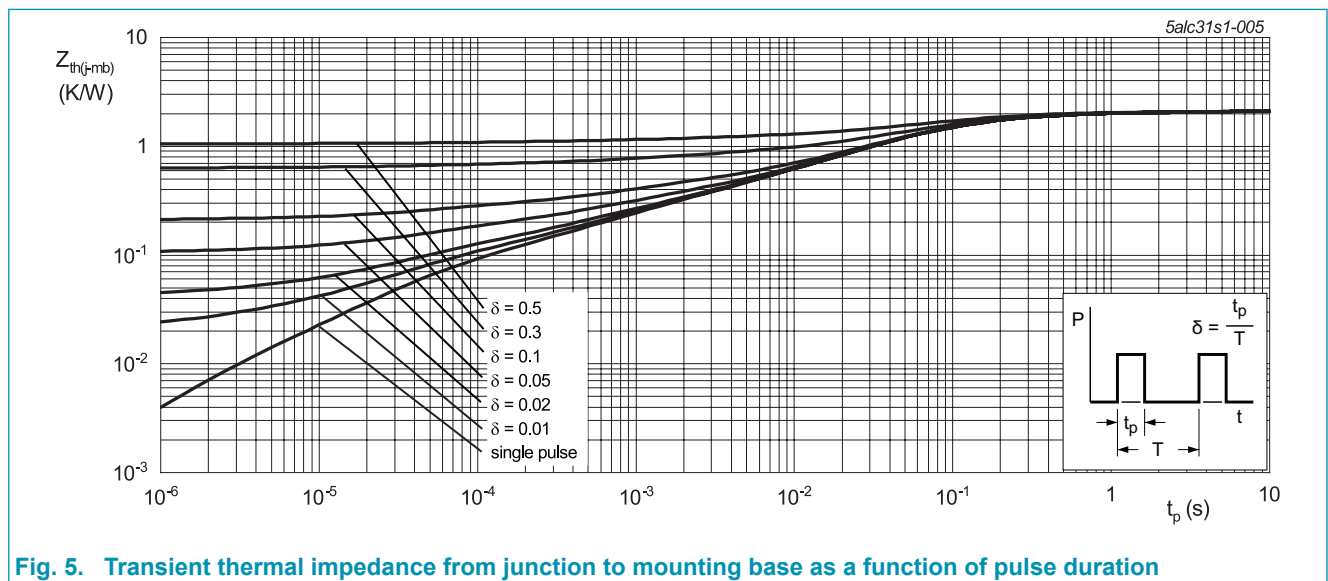


Fig. 5. Transient thermal impedance from junction to mounting base as a function of pulse duration

10. Isolation characteristics

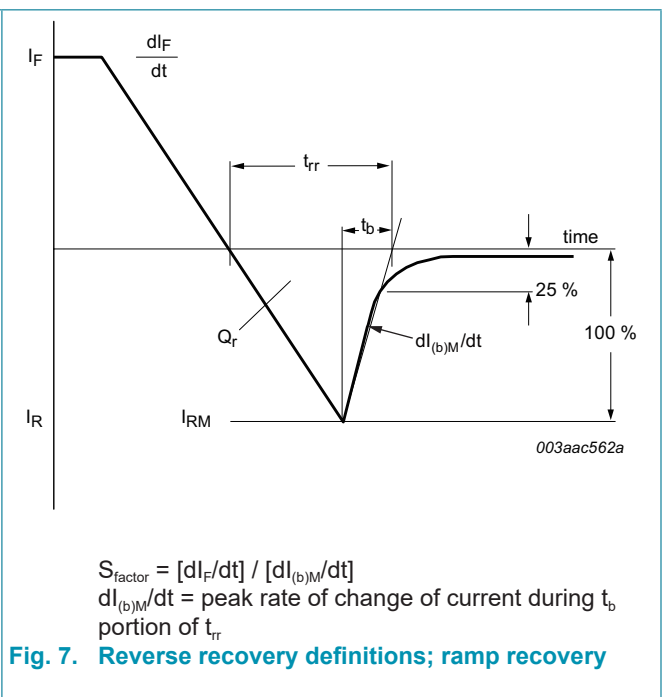
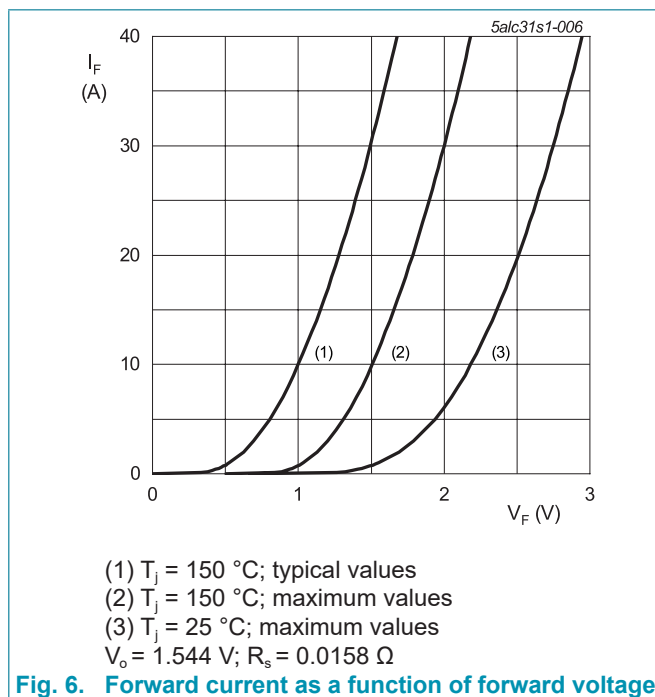
Table 7. Isolation characteristics

Symbol	Parameter	Conditions	Notes	Min	Typ	Max	Unit
$V_{isol(RMS)}$	RMS isolation voltage	$50 \text{ Hz} \leq f \leq 60 \text{ Hz}$; $RH \leq 65 \%$; from all pins to external heatsink; sinusoidal waveform; clean and dust free		-	-	2500	V
C_{isol}	isolation capacitance	$f = 1 \text{ MHz}$; from cathode to external heatsink		-	10	-	pF

11. Characteristics

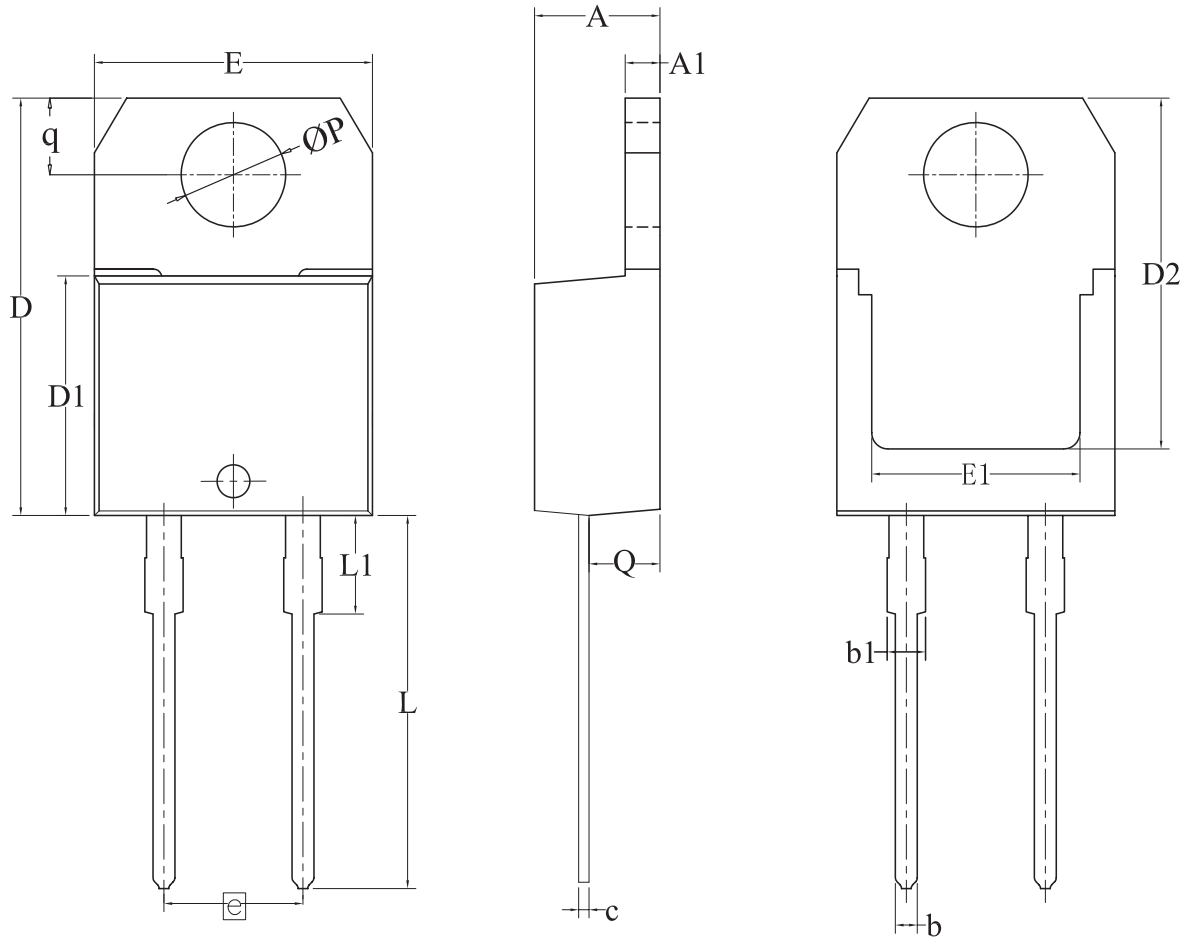
Table 8. Characteristics

Symbol	Parameter	Conditions	Notes	Min	Typ	Max	Unit
Static characteristics							
V _F	forward voltage	I _F = 30 A; T _J = 25 °C; Fig. 6		-	2.00	2.75	V
		I _F = 30 A; T _J = 150 °C; Fig. 6		-	1.50	2.00	V
I _R	reverse current	V _R = 600 V; T _J = 25 °C		-	-	10	μA
		V _R = 600 V; T _J = 150 °C		-	-	0.6	mA
Dynamic characteristics							
t _{rr}	reverse recovery time	I _F = 1 A; V _R = 30 V; dI _F /dt = 50 A/μs; T _J = 25 °C; Fig. 7		-	-	45	ns
		I _F = 30 A; V _R = 200 V; dI _F /dt = 200 A/μs; T _J = 25 °C; Fig. 7		-	51	-	ns
		I _F = 30 A; V _R = 200 V; dI _F /dt = 200 A/μs; T _J = 125 °C; Fig. 7		-	105	-	ns
I _{RM}	peak reverse recovery current	I _F = 30 A; V _R = 200 V; dI _F /dt = 200 A/μs; T _J = 25 °C; Fig. 7		-	3.7	-	A
		I _F = 30 A; V _R = 200 V; dI _F /dt = 200 A/μs; T _J = 125 °C; Fig. 7		-	9.5	-	A
Q _r	recovered charge	I _F = 30 A; V _R = 200 V; dI _F /dt = 200 A/μs; T _J = 25 °C; Fig. 7		-	95	-	nC
		I _F = 30 A; V _R = 200 V; dI _F /dt = 200 A/μs; T _J = 125 °C; Fig. 7		-	498	-	nC
S _{factor}	softness factor	I _F = 30 A; V _R = 200 V; dI _F /dt = 200 A/μs; T _J = 125 °C; Fig. 7		-	0.55	-	



12. Package outline

Plastic single-ended package; isolated heatsink mounted; 1 mounting hole; 2 leads TO-220 ITO220-2L



Unit	A	A1	b	b1	c	D	D1	D2	E	E1	e	L	L1	P	Q	q
MM	min	4.30	1.25	0.69	1.20	0.40	15.20	8.50	12.20	10.00	6.86	12.80	2.70	3.70	2.40	2.70
	max	4.70	1.40	0.90	1.72	0.60	16.00	9.02	12.88	10.40	8.89	5.08 (BSC)	14.00	3.30	3.95	2.80

13. Legal information

Data sheet status

Document status [1][2]	Product status [3]	Definition
Objective [short] data sheet	Development	This document contains data from the objective specification for product development.
Preliminary [short] data sheet	Qualification	This document contains data from the preliminary specification.
Product [short] data sheet	Production	This document contains the product specification.

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- [2] The term 'short data sheet' is explained in section "Definitions".
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14. Contents

1. General description.....	1
2. Features and benefits	1
3. Applications	1
4. Quick reference data	1
5. Pinning information.....	2
6. Ordering information.....	2
7. Marking.....	2
8. Limiting values	3
9. Thermal characteristics	5
10. Isolation characteristics	5
11. Characteristics.....	6
12. Package outline	7
13. Legal information	8
14. Contents	10

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