

Narada HELiON™ NPFC series 48V LFP battery modules are ideally suited for telecom base station, OSP, and renewable energy applications.

NPFC series offer long cycle life, small size, reduced weight, and simplified installation as 19"/23" rack mountable modules.

NPFC LFP chemistry makes it one of the safest technologies, suitable for high and low temperature operation and capable of 1C and higher discharge rates.

**HELiON**  
LI-ION ENERGY



#### Technical Features:

- Simple installation and load/charge system integration (Pos/Neg termination)
- Advanced intelligent lithium battery management technology
- Energy transfer patented technology provides high cell utilization efficiency for prolong system operational life.
- Configuration flexibility, support parallel connection expansion up to 16 modules

#### BMS - Alarming

- System monitoring of voltage, current, temperature of cells and module. Built in protection against; over-current on discharge and recharge, over-temperature, low temperature, low and high voltage, and short circuit.
- BMS maintenance and service communication via RS232 or RS485
- 2 levels of remote alarming through dry contacts

#### Compliance

UL1642, Standard for Lithium Batteries

UL2054, Standard for Household and Commercial Batteries

EN 61000-6-1:2007, Electromagnetic compatibility (EMC)

EN 61000-6-3:2007+A1:2011, Electromagnetic compatibility (EMC)

IEC 62133:2012, Battery Safety Testing

UL1973

NEBS Level 1 Certified GR-1089 / GR-63 up to 80Ah

UN3800

## Dimensions and Specifications

Model No.	V	Ah 8hr to 42V 25C	Ah 1hr to 42V 25C	Max Discharge Current (A)	Width		Depth		Height		Rack Units	Weight		Terminal
					(mm)	(in.)	(mm)	(in.)	(mm)	(in.)		(kg)	(lbs.)	
48NPFC10	48	9.95	9.5	10	442	17.41	243	9.57	44	1.74	1U	7.3	16.1	M4
48NPFC10-2C	48	9.95	9.5	20	442	17.41	245	9.65	44	1.74	1U	7	15.4	M4
48NPFC20*	48	19.9	19.0	20	442	17.41	243	9.65	88	3.47	2U	13.4	28.7	M4
48NPFC20-2C*	48	19.9	19.0	40	442	17.41	245	9.65	88	3.47	2U	13	28.7	M4
48NPFC50-19-3*	48	49.7	47.5	50	442.5	17.41	390	15.4	133	5.24	3U	28.5	70.6	M6
48NPFC80-19-3	48	79.7	76.0	80	442.5	17.41	400	15.8	133	5.24	3U	39.0	85.8	M6
48NPFC100-23-3	48	99.4	95.0	100	522.5	20.87	420	16.6	133	5.24	3U	48	99.2	M6
48NPFC100-19-3*	48	99.4	95.0	100	443	17.42	400	15.8	133	5.24	3U	42	92.4	M6
48NPFC150-23-5	48	150.0	140.0	100	466	18.35	480	18.9	222	8.74	5U	65	143	M6
48NPFC200-23-5~	48	200.0	190.0	100	466	18.35	480	18.9	222	8.74	5U	80	176	M6

Note: Add "-2DC" as a suffix to the part number for major/minor alarm contacts (standard option) not available on 10 Ah model

\* Denotes UL1973 tested/certified compliant product

~Denotes product in UL1973 testing

## Parallel Operation / Discharge Rate

48NPFC10	0.5C < C ≤ 1C, P ≤ 4	C ≤ 0.5C, P ≤ 6	C ≤ 0.3C, P ≤ 10
48NPFC20	0.5C < C ≤ 1C, P ≤ 4	C ≤ 0.5C, P ≤ 6	C ≤ 0.3C, P ≤ 10
48NPFC50	0.5C < C ≤ 1C, P ≤ 4	C ≤ 0.2C, P ≤ 16	0.2C < C ≤ 0.5C, P ≤ 8
48NPFC80	0.5C < C ≤ 1C, P ≤ 4	C ≤ 0.2C, P ≤ 16	0.2C < C ≤ 0.5C, P ≤ 8
48NPFC100	0.5C < C ≤ 1C, P ≤ 4	C ≤ 0.2C, P ≤ 16	0.2C < C ≤ 0.5C, P ≤ 8
48NPFC150	0.33C < C ≤ 0.66C, P ≤ 4	C ≤ 0.33C, P ≤ 6	0.2C < C ≤ 0.2C, P ≤ 10
48NPFC200	0.33C < C ≤ 0.66C, P ≤ 4	C ≤ 0.33C, P ≤ 6	0.2C < C ≤ 0.2C, P ≤ 10

## BMS/Battery Operating Parameters

Parameters	Units	Value
Float charge voltage	V	54 ± 0.5
Equalization charge voltage	V	NA
Nominal charge current	A	0.2C
Charge current limitation	A	0.5C ~ 1.0C
Equalization charge interval	day	NA
Equalization charge duration	H	NA
Equalization charge	A	NA
Condition to float charge	A	0.05C
LVBD (Low voltage battery disconnect)	V	> 40.5
Temperature compensation (float charge)	-mV/°C	NA
Temperature compensation (equalization charge)	-mV/°C	NA

## Operating Environment Limits

Maximum Recommended Temperature Range (°C)	Discharge	-20 ~ +60
	Charge	0 ~ +60
	Storage	0 ~ +40
Recommended Temperature (°C)	Discharge	+15 ~ +35
	Charge	+15 ~ +35
	Storage	+15 ~ +30
Humidity		5% ~ 95%
Over Temperature Protection	High temp. - charge	70±3°C
	Recover temp. - charge	60±3°C
	High temp. - discharge	70±3°C
	Recover temp. - discharge	60±3°C
	Low temp. - charge	0±3°C
	Recover temp. - charge	5±3°C
Low temp. - discharge	-10±3°C	
Recover temp. - discharge	0±3°C	

## LFP (Lithium-Ion)

## NFPC Series

### Constant Current Discharge Rates @25C in Hours (Amps)

#### 48NPFC10 -2C

End	10	8	5	4	3.5	2.5	2	1.5	1	0.5
45.0V	1.0	1.2	2.0	2.4	2.7	3.8	4.7	6.6	8.8	16.9
44.1V	1.0	1.2	2.0	2.5	2.8	3.9	4.8	6.8	9.0	17.4
43.5V	1.0	1.2	2.0	2.5	2.8	3.9	4.9	7.0	9.3	17.9
42.0V	1.0	1.3	2.0	2.5	2.8	4.0	4.9	7.1	9.5	18.3
40.5V	1.0	1.4	2.0	2.5	2.8	4.0	5.0	7.2	9.7	18.6

#### 48NPFC20 -2C

End	10	8	5	4	3.5	2.5	2	1.5	1	0.5
45.0V	2.0	2.4	3.9	4.9	5.5	7.7	9.4	13.2	17.6	33.2
44.1V	2.0	2.5	3.9	4.9	5.6	7.8	9.6	13.5	18.1	34.2
43.5V	2.0	2.5	4.0	5.0	5.6	7.8	9.7	13.9	18.6	35.1
42.0V	2.0	2.5	4.0	5.0	5.6	7.9	9.9	14.3	19.0	36.7
40.5V	2.0	2.5	4.0	5.0	5.7	8.0	10.0	14.5	19.3	37.2

#### 48NPFC50

End	10	8	5	4	3.5	2.5	2	1.5	1
45.0V	4.9	6.1	9.7	11.3	12.1	19.1	23.5	33.7	43.9
44.1V	4.9	6.1	9.8	11.5	12.3	19.4	23.9	34.6	45.2
43.5V	5.0	6.2	9.9	11.6	12.4	19.6	24.3	35.4	46.4
42.0V	5.0	6.2	9.9	11.6	12.4	19.8	24.6	36.1	47.5
40.5V	5.0	6.3	10.0	11.7	12.5	20.0	24.9	36.6	48.2

#### 48NPFC80

End	10	8	5	4	3.5	2.5	2	1.5	1
45.0V	7.6	9.8	15.5	18.1	19.4	30.6	37.6	53.9	70.2
44.1V	7.7	9.8	15.7	18.3	19.7	31.0	38.3	55.3	72.2
43.5V	7.9	9.9	15.8	18.5	19.9	31.3	38.9	56.6	74.3
42.0V	7.9	10.0	15.9	18.6	19.9	31.7	39.4	57.7	76.0
40.5V	8.0	10.0	16.0	18.7	20.0	32.0	39.8	58.5	77.1

#### 48NPFC100

End	10	8	5	4	3.5	2.5	2	1.5	1
45.0V	9.8	12.2	19.4	22.6	24.2	38.2	47.0	67.4	87.8
44.1V	9.8	12.2	19.6	23.0	24.6	38.8	47.8	69.2	90.4
43.5V	10.0	12.4	19.8	23.2	24.8	39.2	48.6	70.8	92.8
42.0V	10.0	12.4	19.8	23.2	24.8	39.6	49.2	72.2	95.0
40.5V	10.0	12.6	20.0	23.4	25.0	40.0	49.8	73.2	96.4

#### 48NPFC150

End	10	8	5	4	3.5	2.5	2	1.5	1
45.0V	14.7	18.3	29.1	33.9	36.3	57.3	70.5	87.8	87.8
44.1V	14.7	18.3	29.4	34.5	36.9	58.2	71.7	90.4	90.4
43.5V	15.0	18.6	29.7	34.8	37.2	58.8	72.9	92.8	92.8
42.0V	15.0	18.6	29.7	34.8	37.2	59.4	73.8	95.0	95
40.5V	15.0	18.9	30.0	35.1	37.5	60.0	74.7	96.4	96.4

#### 48NPFC200

End	10	8	5	4	3.5	2.5	2	1.5	1
45.0V	19.6	24.4	38.8	45.2	48.4	76.4	87.8	87.8	87.8
44.1V	19.6	24.4	39.2	46.0	49.2	77.6	90.4	90.4	90.4
43.5V	20.0	24.8	39.6	46.4	49.6	78.4	92.8	92.8	92.8
42.0V	20.0	24.8	39.6	46.4	49.6	79.2	95.0	95.0	95
40.5V	20.0	25.2	40.0	46.8	50.0	80.0	96.4	96.4	96.4

### Constant Power Discharge Rates @25C in Hours (Watts)

#### 48NPFC10 -2C

End	10	8	5	4	3.5	2.5	2	1.5	1	0.5
45.0V	49.9	61.4	98	125	138	136	233	307	445	647
44.1V	50.2	61.8	99	126	139	137	236	310	453	662
43.5V	50.5	62.1	99	127	140	138	238	312	459	675
42.0V	50.9	62.5	100	128	141	139	240	317	467	687
40.5V	51.1	62.9	101	128	142	140	242	320	470	689

#### 48NPFC20 -2C

End	10	8	5	4	3.5	2.5	2	1.5	1	0.5h
45.0V	100	123	196	250	277	273	467	614	891	1294
44.1V	101	124	198	252	279	275	472	619	906	1324
43.5V	101	124	199	253	280	276	477	624	918	1349
42.0V	102	125	200	255	282	279	480	635	934	1373
40.5V	102	126	201	256	284	280	484	640	939	1377

#### 48NPFC50

End	10	8	5	4	3.5	2.5	2	1.5	1
45.0V	250	307	491	625	692	682	1167	1534	2227
44.1V	251	309	494	629	696	686	1181	1549	2264
43.5V	252	311	497	633	700	690	1192	1561	2294
42.0V	254	313	500	637	706	697	1200	1587	2334
40.5V	255	314	503	640	709	701	1209	1601	2348

#### 48NPFC80

End	10	8	5	4	3.5	2.5	2	1.5	1
45.0V	399	491	785	1000	1107	1091	1867	2454	3564
44.1V	402	494	791	1007	1114	1098	1889	2478	3623
43.5V	404	497	795	1012	1120	1104	1907	2497	3671
42.0V	407	500	800	1020	1130	1116	1921	2540	3735
40.5V	409	503	805	1024	1134	1122	1934	2561	3756

#### 48NPFC100

End	10	8	5	4	3.5	2.5	2	1.5	1
45.0V	500	614	982	1250	1384	1364	2334	3068	4454
44.1V	502	618	988	1258	1392	1372	2362	3098	4528
43.5V	504	622	994	1266	1400	1380	2384	3122	4588
42.0V	508	626	1000	1274	1412	1394	2400	3174	4668
40.5V	510	628	1006	1280	1418	1402	2418	3202	4696

#### 48NPFC150

End	10	8	5	4	3.5	2.5	2	1.5	1
45.0V	750	921	1473	1875	2076	2046	3501	4454	4454
44.1V	753	927	1482	1887	2088	2058	3543	4528	4528
43.5V	756	933	1491	1899	2100	2070	3576	4588	4588
42.0V	762	939	1500	1911	2118	2091	3600	4668	4668
40.5V	765	942	1509	1920	2127	2103	3627	4696	4696

#### 48NPFC200

End	10	8	5	4	3.5	2.5	2	1.5	1
45.0V	1000	1228	1964	2500	2768	2728	4454	4454	4454
44.1V	1004	1236	1976	2516	2784	2744	4528	4528	4528
43.5V	1008	1244	1988	2532	2800	2760	4588	4588	4588
42.0V	1016	1252	2000	2548	2824	2788	4668	4668	4668
40.5V	1020	1256	2012	2560	2836	2804	4696	4696	4696

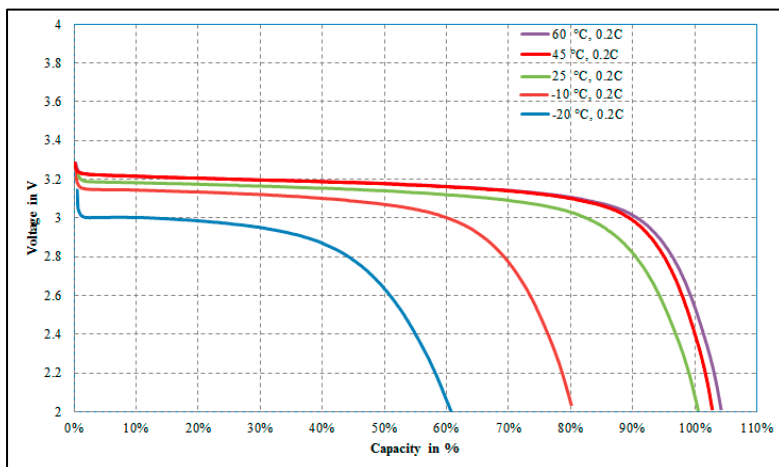
### Cycles - Temperature vs. Depth of Discharge

Temp (°C)	Depth of Discharge (DoD)				
	100%	80%	60%	40%	20%
25	2000	3500	6000	12000	24000
35	1600	2800	4800	9600	19200
45	1200	2100	3600	7200	14400



48V  
48NPFC50  
Outdoor Enclosure

### Discharge - Temperature vs. Percent Capacity %



### 50Ah, 80Ah & 100Ah Module Height and Capacity Specifications 1-8 Modules (42V End)

Model	1		2		3		4		5		6		7		8	
	Ah @8hr	Height (in.)	Ah @8hr	Height (in.)	Ah @8hr	Height (in.)	Ah @8hr	Height (in.)	Ah @8hr	Height (in.)	Ah @8hr	Height (in.)	Ah @8hr	Height (in.)	Ah @8hr	Height (in.)
48NPFC50	50	5.25	100	10.5	150	15.75	200	21	250	26.25	300	31.5	350	36.75	400	42
48NPFC80	80	8.75	160	17.5	240	26.25	320	35	400	43.75	480	52.5	560	61.25	640	70
48NPFC100	99.2	5.25	198.4	10.5	297.6	15.75	396.8	21	496	26.25	595.2	31.5	694.4	36.75	793.6	42
48NPFC150	148.8	8.75	297.6	17.5	446.4	26.25	595.2	35	744	43.75	892.8	52.5	1041.6	61.25	1190.4	70
48NPFC200	198.4	8.75	396.8	17.5	595.2	26.25	793.6	35	992	43.75	1190.4	52.5	1388.8	61.25	1587.2	70



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