

DIIPM™

Applications Include:

- HVAC (Compressors, Blowers, Pumps)
- Refrigerators
- Small Motor Controls
- Washing Machines

Packages:

- Medium Power
- Mini
- Super Mini

Circuit Configuration:

- 6-Pac
- PFC

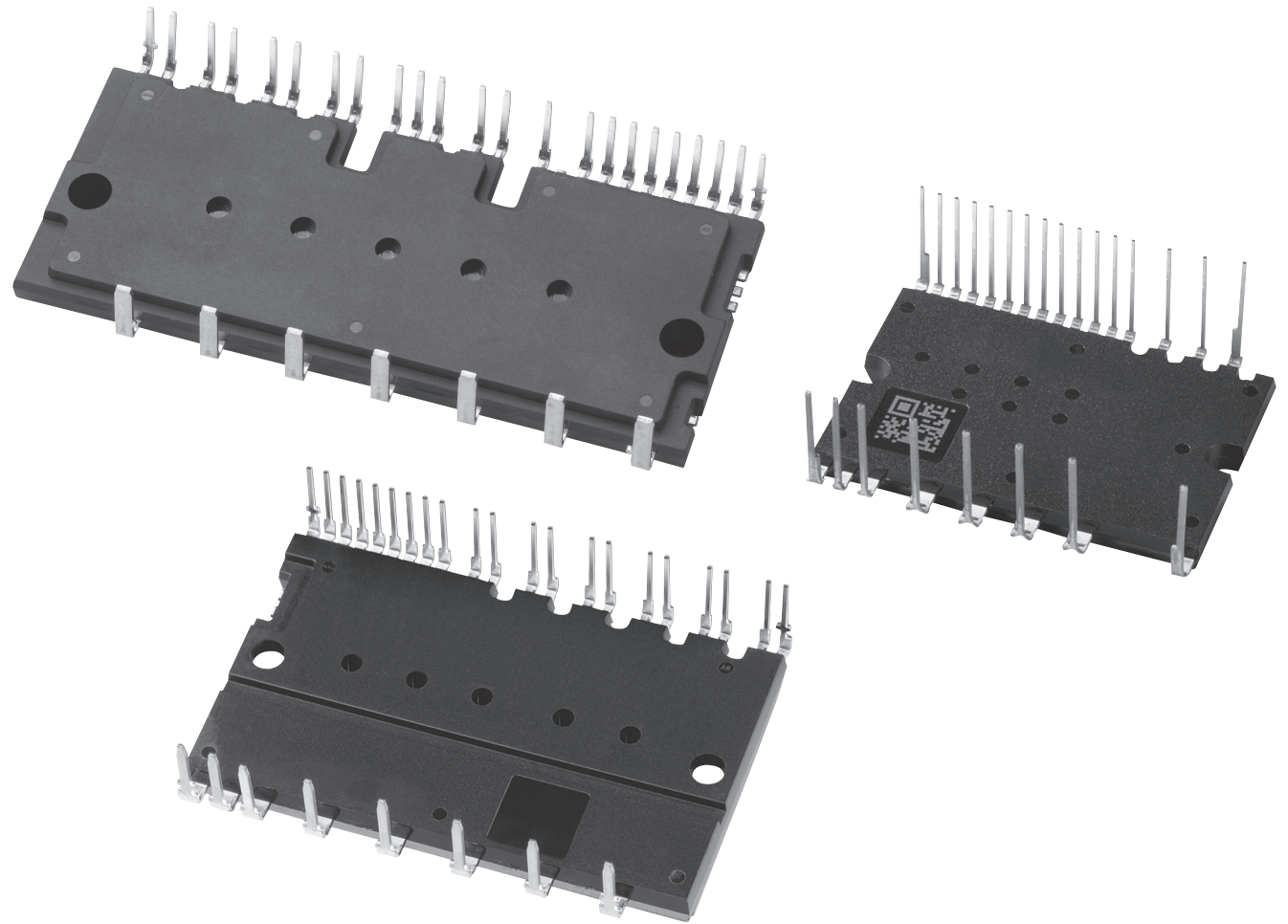
Features:

- Gate Drive
- Gate Drive Undervoltage (UV) Lockout
- Short Circuit (SC) Protection

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VOLTAGE: 600V TO 1200V
CURRENT: 3A TO 75A

Custom Modules

IGBT Assemblies

Assemblies

Fast Recovery & Three-Phase Diode Modules

Thyristor & Diode Modules

Discrete Rectifiers

Discrete Thyristors

Accessories

DIIPM

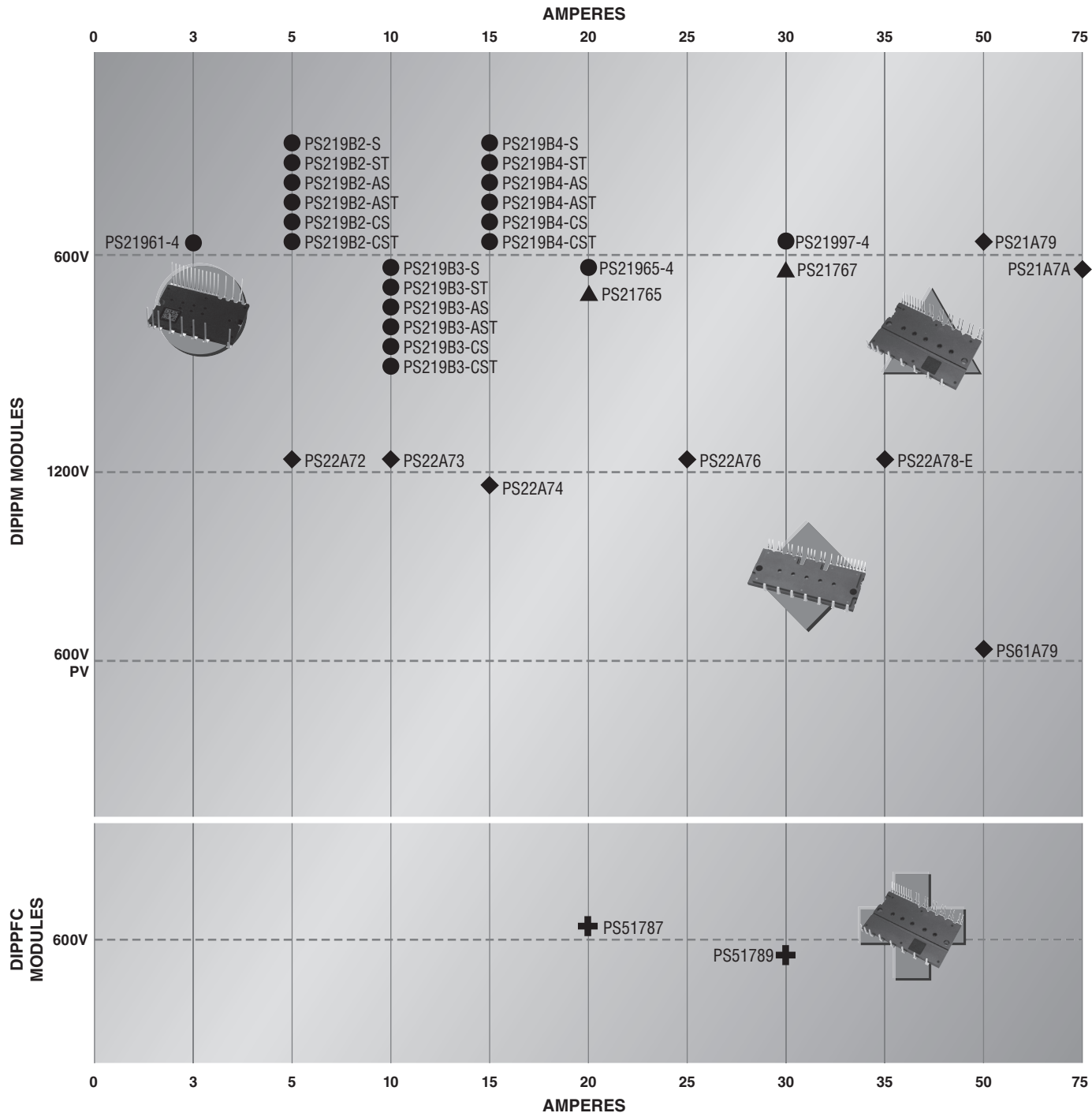
IPMs

MOSFET Modules

Hybrid IGBTs

IGBTs

Product Overview



Numbering System

PS22A78-E is a DIPIP Version 4 transfer mold IPM rated at 1200 Volts and 35 Amperes.

PS2 2 A 7 8 - E

(1) (2) (3) (4) (5) (6)

(1) Device:

PS2 = Transfer
Mold Type IPM
PS5 = DIPPFC
PS6 = Transfer
Mold Type
Photovoltaic IPM

(2) Voltage (V_{CES})

1 = 600V
2 = 1200V

(3) Package Style

7 = Mini DIPIP
Version 4
9 = Super-Mini
A = DIPIP
Version 4

(4) Factory Information

(5) Current Rating (I_C)

1 = 3A
2 = 5A
3 = 10A
4 = 15A
5 = 20A
7 = 30A
8 = 35A
9 = 50A
A = 75A

(6) Options*

A = Long Pins
S = Open Emitter
T = Over-Temperature
Protection
C = Zig Zag Lead Form
4 = Factory Information
E = Factory Specification

*Available options vary by product family.

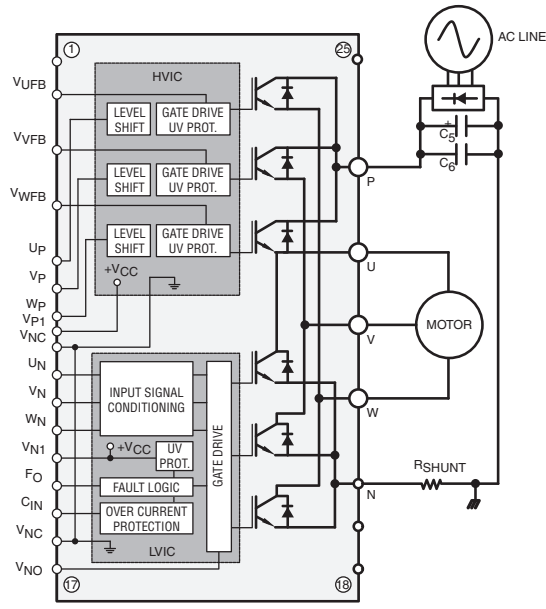
DIIPM 600V Modules, (Refer to device datasheets at www.pwr.com for test conditions.)

Type	Options (-Part Number Suffix)	MAXIMUM RATINGS (IGBT Inverter Sector)				ELECTRICAL CHARACTERISTICS					THERMAL CHARACTERISTICS		Outline Drawings		
		V _{CES} Volts	I _C /I _{CP} Amperes	P _D Watts	V _{RMS} Isolation Volts	Typ. V _{CE(SAT)} Volts	V _{EC} Volts	I _{CES} mA	V _{CC(prot)} Volts	t _{DEAD(min)} µsec	IGBT (Max.) R _{th(j-c)} °C/W	Diode (Max.) R _{th(j-c)} °C/W	Weight Grams	Number	Page
PS21961-4	(-A, -C, -S, -T)*	600	3 / 6	21.3	1500**	1.6	1.55	1.0	400	1.5	4.7	—	10	1	E-6
PS219B2-S	(-AS, -CS, -ST, -AST, -CST)*	600	5 / 10	21.3	1500**	1.5	1.70	1.0	400	1.0	4.7	5.4	8.5	5	E-8
PS219B3-S	(-AS, -CS, -ST, -AST, -CST)*	600	10 / 20	27.0	1500**	1.5	1.70	1.0	400	1.0	3.7	4.5	8.5	5	E-8
PS219B4-S	(-AS, -CS, -ST, -AST, -CST)*	600	15 / 30	33.3	1500**	1.5	1.70	1.0	400	1.0	3.0	3.9	8.5	5	E-8
PS21965-4	(-A, -C, -S, -T)*	600	20 / 40	35.7	1500**	1.7	1.9	1.0	400	1.5	2.8	3.9	10	1	E-6
PS21997-4	(-A, -C, -T)*	600	30 / 60	47.6	1500**	1.9	1.7	1.0	400	2.0	2.1	3.0	10	1	E-6
PS21765		600	20 / 40	76.9	2500	1.6	1.5	1.0	400	2.0	1.3	3.0	20	2	E-6
PS21767		600	30 / 60	90.9	2500	1.6	1.5	1.0	400	2.0	1.1	2.8	20	2	E-6

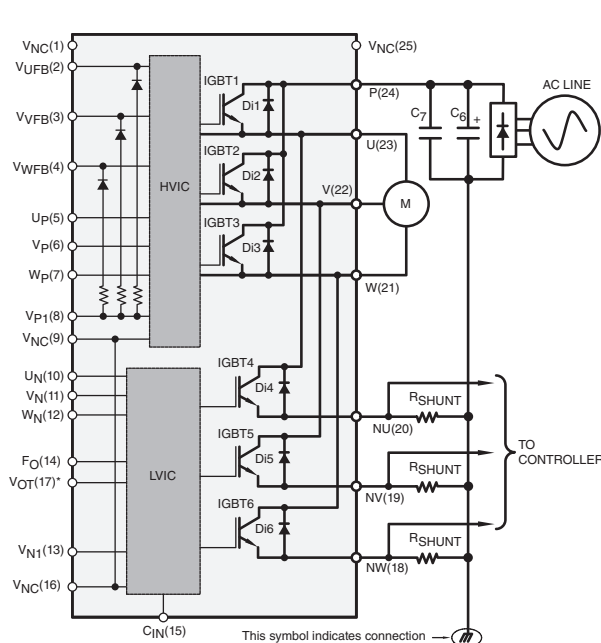
*A = Long Pins, C = ZigZag Leadform,
S = Open Emitters, T = Over Temperature Protection

**2500V with Convex Heatsink

PS21961-4, PS21965-4, PS21997-4

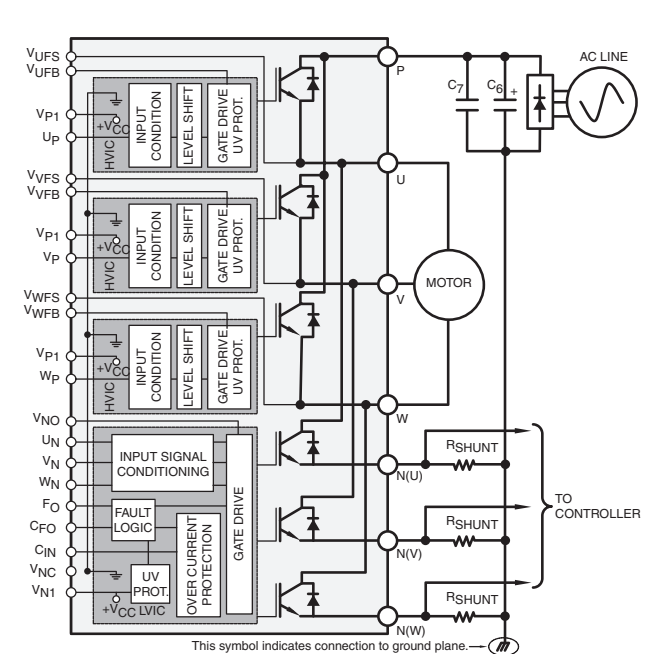


PS219B2-S, PS219B3-S, PS219B4-S



NOTE: For -ST, -AST, -CST Pin 17 is NC

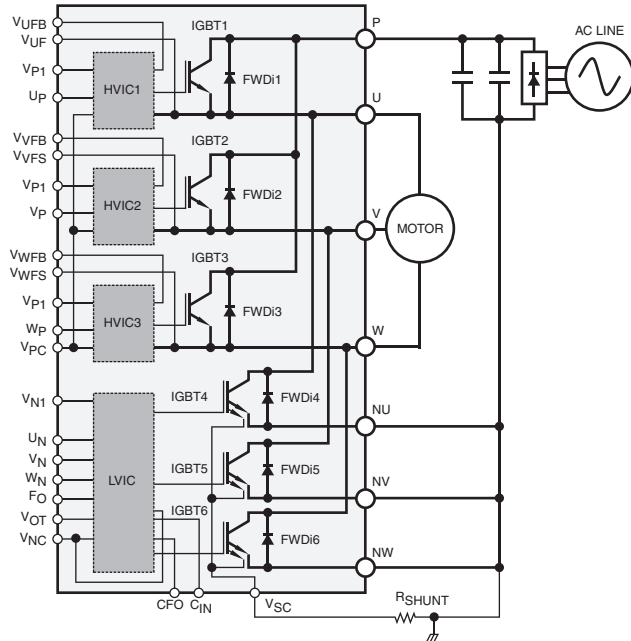
PS21765, PS21767



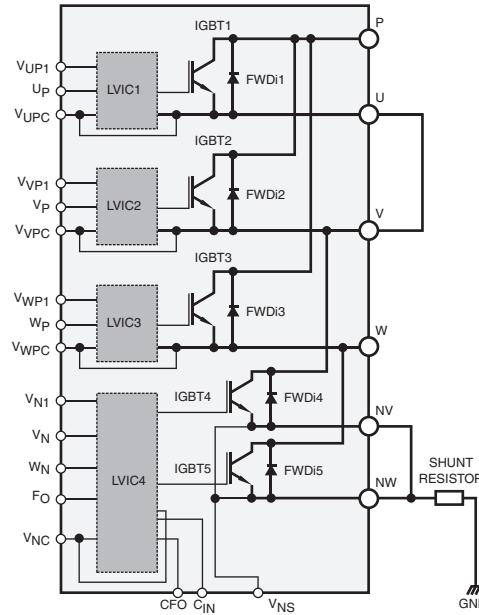
DIIPM 600V (cont'd), 1200V & 600V PV Modules, (Refer to device datasheets at www.pwr.com for test conditions.)

MAXIMUM RATINGS (IGBT Inverter Sector)					ELECTRICAL CHARACTERISTICS					THERMAL CHARACTERISTICS		Weight Grams	Outline Drawings	
Type	V _{CE(S)} Volts	I _C Amperes	P _d Watts	V _{RMS} Isolation Volts	IGBT Inverter Sector					IGBT (Max.) R _{th(j-c)} °C/W	Diode (Max.) R _{th(j-c)} °C/W		Number	Page
600V DIIPMs														
PS21A79	600	50 / 100	142	2500	1.55	1.7	1.0	400	2.0	0.88	1.78	65	3	E-7
PS21A7A	600	75 / 150	162	2500	1.55	1.7	1.0	400	2.0	0.77	1.25	65	3	E-7
1200V DIIPMs														
PS22A72	1200	5 / 10	44.6	2500	1.9	2.5	1.0	800	3.3	2.24	2.74	65	3	E-7
PS22A73	1200	10 / 20	66.2	2500	1.9	2.5	1.0	800	3.3	1.51	1.78	65	3	E-7
PS22A74	1200	15 / 30	86.9	2500	1.9	2.5	1.0	800	3.3	1.15	1.36	65	3	E-7
PS22A76	1200	25 / 50	113.6	2500	1.9	2.5	1.0	800	3.3	0.88	1.25	65	3	E-7
PS22A78-E	1200	35 / 70	129.9	2500	1.9	2.8	1.0	800	3.3	0.77	1.25	65	3	E-7
600V PV DIIPM														
PS61A79	600	50 / 100	142	2500	2.0	2.8	1.0	400	2.0	0.88	1.78	46	3	E-7

PS21A79, PS21A7A,
PS22A72, PS22A73, PS22A74, PS22A76, PS22A78-E



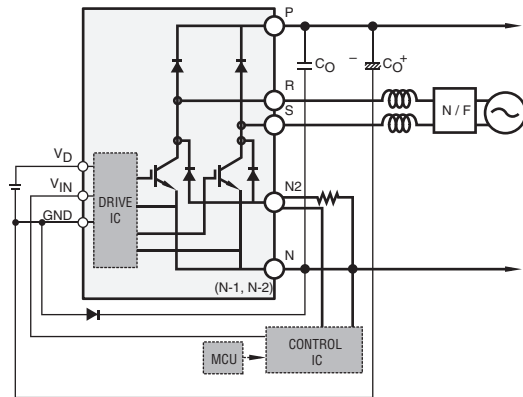
PS61A79



DIPFC 600V Modules, (Refer to device datasheets at www.pwr.com for test conditions.)

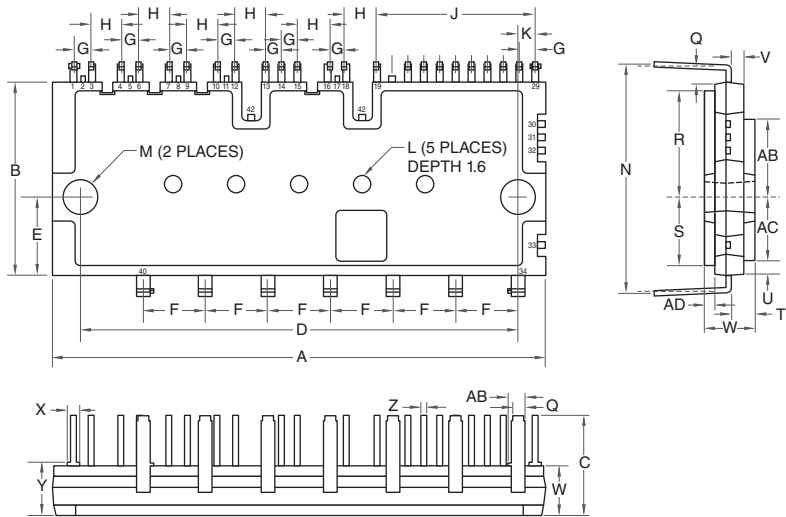
MAXIMUM RATINGS (IGBT)				ELECTRICAL CHARACTERISTICS				THERMAL CHARACTERISTICS		Weight Grams	Outline Drawings Number Page	
Type	V_{CES} Volts	$I_{i(RMS)}$ Amperes	V_{RMS} Isolation Volts	IGBT Inverter Sector				IGBT $R_{th(j-c)}$ °C/W	Diode $R_{th(j-c)}$ °C/W		Number	Page
				Typ. $V_{CES(SAT)}$ Volts	Typ. $V_{EC(H)}$ Volts	Typ. $V_{EC(L)}$ Volts	I_{CES} mA					
PS51787	600	20	2500	2.05	2.2	1.2	1.0	0.96	1.35	54	4 E-7	
PS51789	600	30	2500	2.10	2.2	1.2	1.0	0.68	0.90	54	4 E-7	

PS51787, PS51789



3

PS21A79, PS21A7A,
PS22A72, PS22A73, PS22A74, PS22A76, PS22A78-E,
PS61A79



TERMINAL CODE

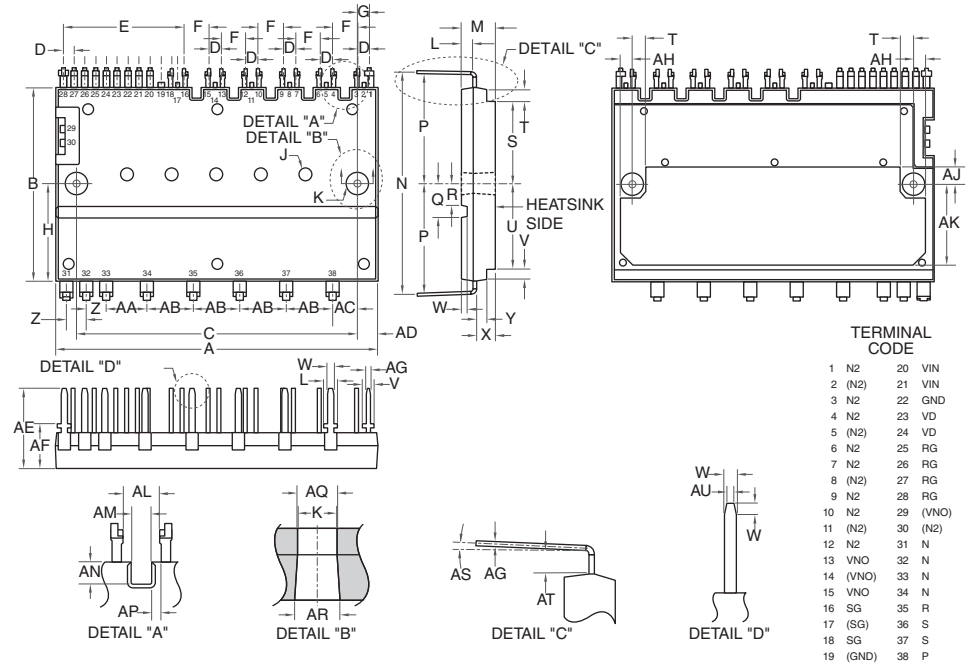
- 1 UP
- 2 (VPC)
- 3 VP1
- 4 VJFB
- 5 (UPG)
- 6 VJFS
- 7 VP
- 8 VPC
- 9 VP1
- 10 VVFB
- 11 VPG
- 12 VVFS
- 13 WP
- 14 WP1
- 15 VPC
- 16 VVFB
- 17 WPG
- 18 VVFS
- 19 VSC
- 20 UNG
- 21 VN1
- 22 VNC
- 23 VOT
- 24 CIN
- 25 CFO
- 26 FO
- 27 UN
- 28 VN
- 29 WN
- 30 VNC
- 31 WNG
- 32 VNG
- 33 W
- 34 NW
- 35 NV
- 36 NU
- 37 W
- 38 V
- 39 U
- 40 P
- 41 U
- 42 V

Dim.	Inches	Millimeters
A	3.11±0.02	79.0±0.5
B	1.22±0.02	31.0±0.5
C	0.63	16.0
D	2.76±0.01	70.0±0.3
E	0.5	12.7
F	0.39±0.01	10.0±0.3
G	0.1±0.01	2.54±0.3
H	0.2±0.01	5.08±0.3
J	1.0	25.4
K	0.11	2.8
L	0.12 Dia.	2.9 Dia.
M	0.18±0.01 Dia.	4.5±0.2 Dia.
N	1.42±0.02	36.2±0.5
P	0.03	0.7

Dim.	Inches	Millimeters
Q	0.08	2.0
R	0.66	16.73
S	0.44	11.13
T	0.15±0.04	3.8±1.0
U	0.082	2.1
V	0.086	2.2
W	0.31	8.0
X	0.07	1.8
Y	0.34	8.6
Z	0.03	0.8
AA	0.10	2.7
AB	0.48	12.33
AC	0.39	10.12
AD	0.068	1.75

4

PS51787, PS51789



TERMINAL CODE

- 1 N2
- 2 (N2)
- 3 N2
- 4 N2
- 5 (N2)
- 6 N2
- 7 N2
- 8 (N2)
- 9 N2
- 10 N2
- 11 (N2)
- 12 N2
- 13 VNO
- 14 (VNO)
- 15 VNO
- 16 SG
- 17 (SG)
- 18 SG
- 19 (GND)
- 20 VIN
- 21 VIN
- 22 GND
- 23 VD
- 24 VD
- 25 RG
- 26 RG
- 27 RG
- 28 RG
- 29 (N2)
- 30 (N2)
- 31 N
- 32 N
- 33 N
- 34 N
- 35 R
- 36 S
- 37 S
- 38 P

Dim.	Inches	Millimeters
A	2.07	52.5
B	1.22	31.0
C	1.81±0.008	46.0±0.2
D	0.07±0.008	1.78±0.2
E	0.77	19.58
F	0.17±0.008	4.32±0.2
G	0.08±0.019	2.04±0.3
H	0.61	15.5
J	0.09 Dia. x 0.1 Depth	2.2 Dia. x 2.6 Depth
K	0.13 Dia.	3.3 Dia.
L	0.08	2.0
M	0.22	5.6
N	1.41±0.02	35.9±0.5
P	0.69	17.7

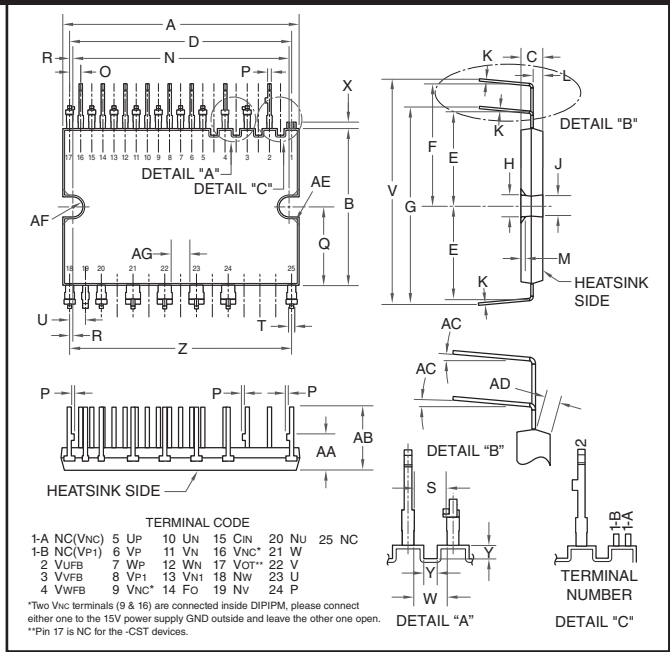
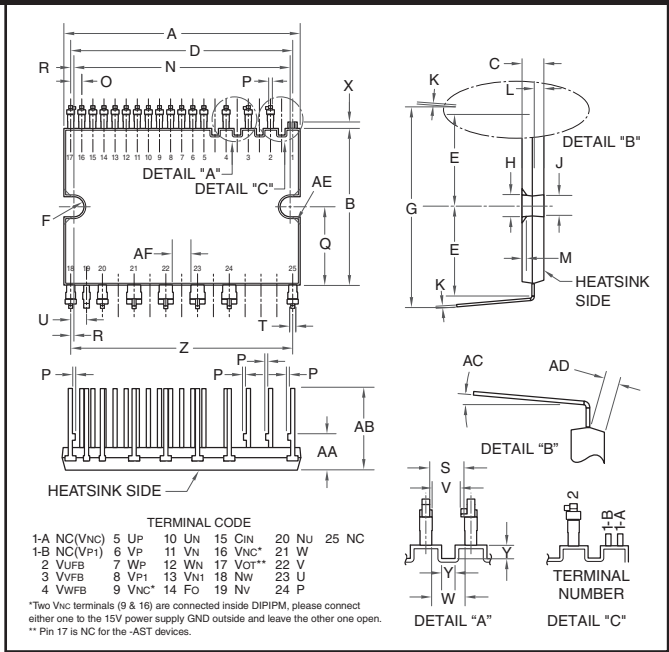
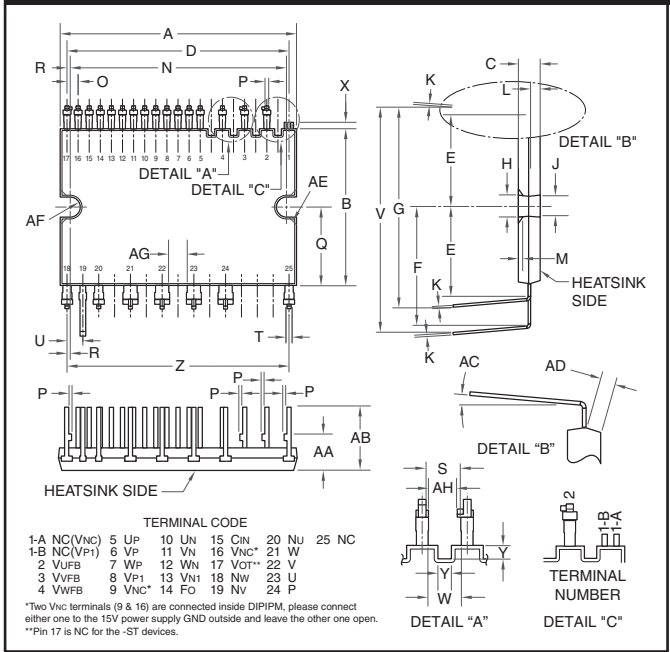
Dim.	Inches	Millimeters
Q	0.216	5.5
R	0.14	3.5
S	0.503	12.78
T	0.09	2.2
U	0.53	13.5
V	0.06	1.5
W	0.04	1.0
X	0.06	1.55
Y	0.12	3.1±0.1
Z	0.13±0.019	3.3±0.3
AA	0.26±0.019	6.6±0.3
AB	0.3±0.019	7.62±0.3
AC	0.15±0.019	3.95±0.3
AD	0.13	3.25
AE	0.5	12.7

Dim.	Inches	Millimeters
AF	0.28	7.1
AG	0.02	0.5
AH	0.067	1.7
AJ	0.11	2.8
AK	0.51	13.0
AL	0.114	2.9
AM	0.063	1.6
AN	0.068	1.75
AP	0.03	0.75
AQ	0.14 Dia.	3.5 Dia.
AR	0.145 Dia.	3.7 Dia.
AS		0° ~ 5°
AT	0.078	1.96
AU	0.023	0.6

5 PS219B2-S, PS219B2-ST, PS219B3-S,
PS219B3-ST, PS219B4-S, PS219B4-ST

PS219B2-AS, PS219B2-AST, PS219B3-AS,
PS219B3-AST, PS219B4-AS, PS219B4-AST

PS219B2-CS, PS219B2-CST, PS219B3-CS,
PS219B3-CST, PS219B4-CS, PS219B4-CST



Dim.	Inches	Millimeters
A	1.50±0.02	38.0±0.5
B	0.94±0.02	24.0±0.5
C	0.14	3.5
D	1.40	35.56
E	0.57±0.02	14.4±0.5
F	0.74±0.02	18.9±0.5
G	1.15±0.02	29.2±0.5
H	0.14	3.5
J	0.13	3.3
K	0.016	0.4
L	0.06±0.02	1.5±0.05
M	0.031	0.8
N	1.38±0.019	35.0±0.3
O	0.07±0.008	1.778±0.2
P	0.02	0.5
Q	0.47	12.0
R	0.011	0.28

Dim.	Inches	Millimeters
S	0.1046	2.656
T	0.024	0.6
U	0.1±0.008	2.54±0.2
V	1.33±0.02	33.7±0.5
W	0.1085	2.756
X	0.04	1.0
Y	0.05	1.2
Z	1.40	35.56
AA	0.22±0.02	5.5±0.5
AB	0.37±0.02	9.5±0.5
AC	0 ~ 5°	0 ~ 5°
AD	0.06 Min.	1.5 Min.
AE	0.05	1.2
AF	0.063 Rad.	1.6 Rad.
AG	0.118 Min.	3.0 Min.
AH	0.098 Min.	2.5 Min.

Dim.	Inches	Millimeters
A	1.50±0.02	38.0±0.5
B	0.94±0.02	24.0±0.5
C	0.14	3.5
D	1.40	35.56
E	0.57±0.02	14.4±0.5
F	0.063 Rad.	1.6 Rad.
G	1.16±0.02	29.4±0.5
H	0.14	3.5
J	0.13	3.3
K	0.016	0.4
L	0.06±0.02	1.5±0.05
M	0.031	0.8
N	1.38±0.019	35.0±0.3
O	0.07±0.008	1.778±0.2
P	0.02	0.5
Q	0.47	12.0

Dim.	Inches	Millimeters
R	0.011	0.28
S	0.1046	2.656
T	0.024	0.6
U	0.1±0.008	2.54±0.2
V	0.098 Min.	2.5 Min.
W	0.1085	2.756
X	0.04	1.0
Y	0.05	1.2
Z	1.40	35.56
AA	0.22±0.02	5.5±0.5
AB	0.55±0.02	14.0±0.5
AC	0 ~ 5°	0 ~ 5°
AD	0.06 Min.	1.5 Min.
AE	0.05	1.2
AF	0.118 Min.	3.0 Min.

Dim.	Inches	Millimeters
A	1.50±0.02	38.0±0.5
B	0.94±0.02	24.0±0.5
C	0.14	3.5
D	1.40	35.56
E	0.57±0.02	14.4±0.5
F	0.74±0.02	18.9±0.5
G	1.15±0.02	29.2±0.5
H	0.14	3.5
J	0.13	3.3
K	0.016	0.4
L	0.06±0.02	1.5±0.05
M	0.031	0.8
N	1.38±0.019	35.0±0.3
O	0.07±0.008	1.778±0.2
P	0.02	0.5
Q	0.47	12.0

Dim.	Inches	Millimeters
R	0.011	0.28
S	0.1046	2.656
T	0.024	0.6
U	0.1±0.008	2.54±0.2
V	1.33±0.02	33.7±0.5
W	0.1085	2.756
X	0.04	1.0
Y	0.05	1.2
Z	1.40	35.56
AA	0.22±0.02	5.5±0.5
AB	0.37±0.02	9.5±0.5
AC	0 ~ 5°	0 ~ 5°
AD	0.06 Min.	1.5 Min.
AE	0.05	1.2
AF	0.063 Rad.	1.6 Rad.
AG	0.118 Min.	3.0 Min.