



DESCRIPTIONS

The EC49021A are USB dedicated charging port (DCP) controllers. An auto-detect feature monitors USB data line voltage, and automatically provides the correct electrical signatures on the data lines to charge compliant devices among the following dedicated charging schemes:

- Divider 1 DCP, required to apply 2 V and 2.7 V on the D+ and D– Lines respectively.
- Divider 2 DCP, required to apply 2.7 V and 2 V on the D+ and D– Lines respectively.
- BC1.2 DCP, required to short the D+ Line to the D– Line
- Chinese Telecom Standard YD/T 1591-2009 Shorted Mode, required to short the D+ Line to the D– Line.
- 1.2 V on both D+ and D– Lines.

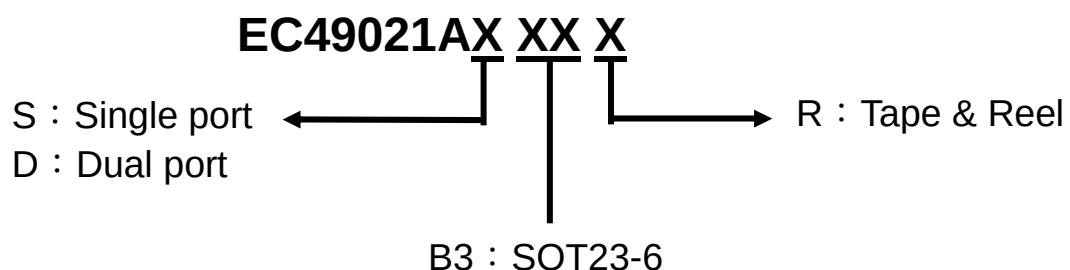
FEATURE

- Supports USB DCP Shorting D+ Line to D- Line per USB Battery Charging Specification, Revision 1.2(BC1.2).
- Supports Shorted Mode (Shorting D+ Line to D- Line) per Chinese Telecommunication Industry Standard YD/T 1591-2009.
- Supports USB DCP Applying 2.7 V on D+ Line and 2 V on D- line (or USB DCP Applying 2 V on D+ Line and 2.7 V on D– Line).
- Supports USB DCP Applying 1.2 V on D+ and D– Lines.
- Automatically Switch D+ and D- Lines Connections for an Attached Device.
- Dual USB Port Controller, EC49021AD.
Single USB Port Controller, EC49021AS.
- Operating Range: 4.5 V to 5.5 V.
- Available in SOT23-6 Package.

APPLICATION

- Vehicle USB Power Charger
- AC-DC Adapter with USB Port
- Other USB charger

ORDERING INFORMATION

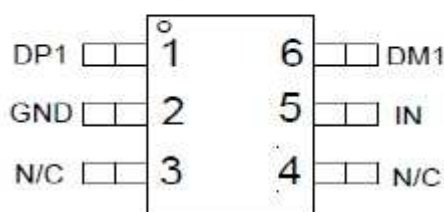


Part Number	Package	Marking	Marking Information
EC49021ASB3R	SOT23-6L	49021 ASLLL	1. LLL : Lot No.
EC49021ADB3R	SOT23-6L	49021 ADLLL	2. LLL : Lot No.

PIN CONFIGURATION

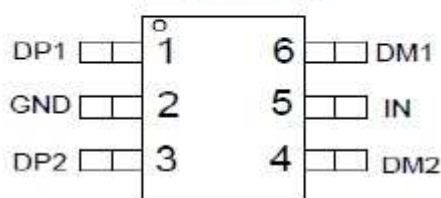
EC49021ASB3R

(Top View)



EC49021ADB3R

(Top View)



PIN DESCRIPTION

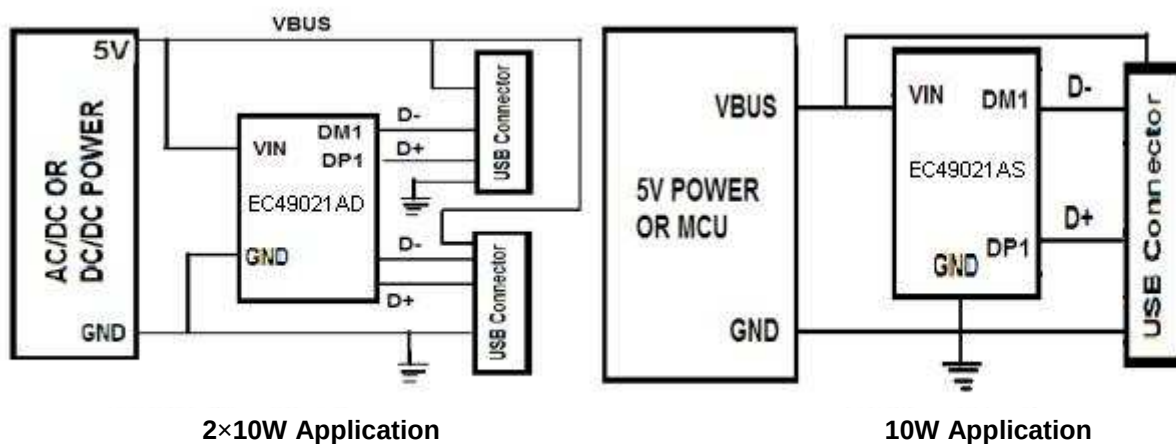
EC49021ASB3R :

NO.	NAME	TYPE	DESCRIPTION
1	DP1	I/O	Connected to the D+ or D– line of USB connector, provide the correct voltage with attached portable equipment for DCP detection.
2	GND	G	Ground connection
3	N/C	–	No connect pin. Can be grounded or left floating.
4	N/C	–	No connect pin. Can be grounded or left floating.
5	IN	P	Power supply. Connect a ceramic capacitor with a value of 0.1-μF or greater from the IN pin to GND as close to the device as possible.
6	DM1	I/O	Connected to the D+ or D– line of USB connector, provide the correct voltage with attached portable equipment for DCP detection.

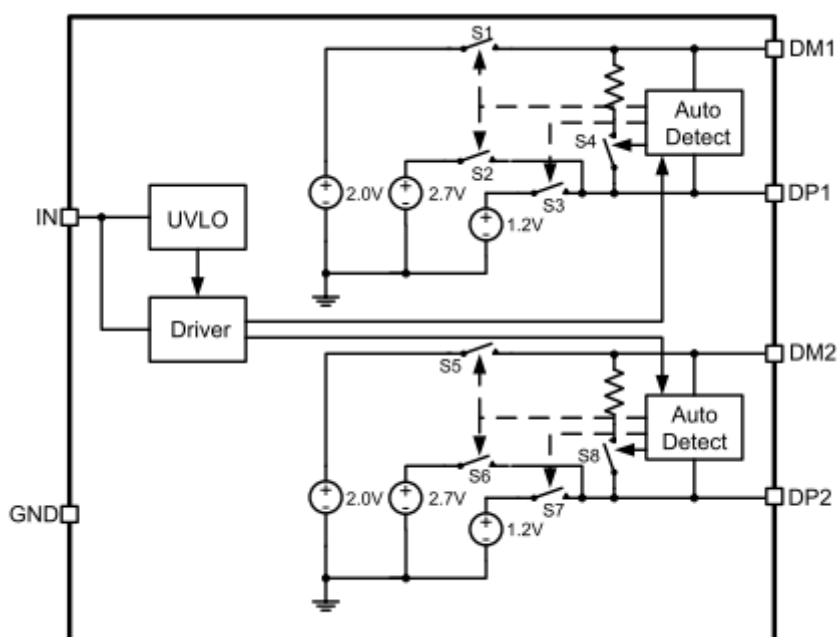
EC49021ADB3R :

NO.	NAME	TYPE	DESCRIPTION
1	DP1	I/O	Connected to the D+ or D– line of USB connector, provide the correct voltage with attached portable equipment for DCP detection.
2	GND	G	Ground connection
3	DP2	I/O	Connected to the D+ or D– line of USB connector, provide the correct voltage with attached portable equipment for DCP detection.
4	DM2	I/O	Connected to the D+ or D– line of USB connector, provide the correct voltage with attached portable equipment for DCP detection.
5	IN	P	Power supply. Connect a ceramic capacitor with a value of 0.1-μF or greater from the IN pin to GND as close to the device as possible.
6	DM1	I/O	Connected to the D+ or D– line of USB connector, provide the correct voltage with attached portable equipment for DCP detection.

TYPICAL APPLICATION



FUNCTIONAL BLOCK DIAGRAM



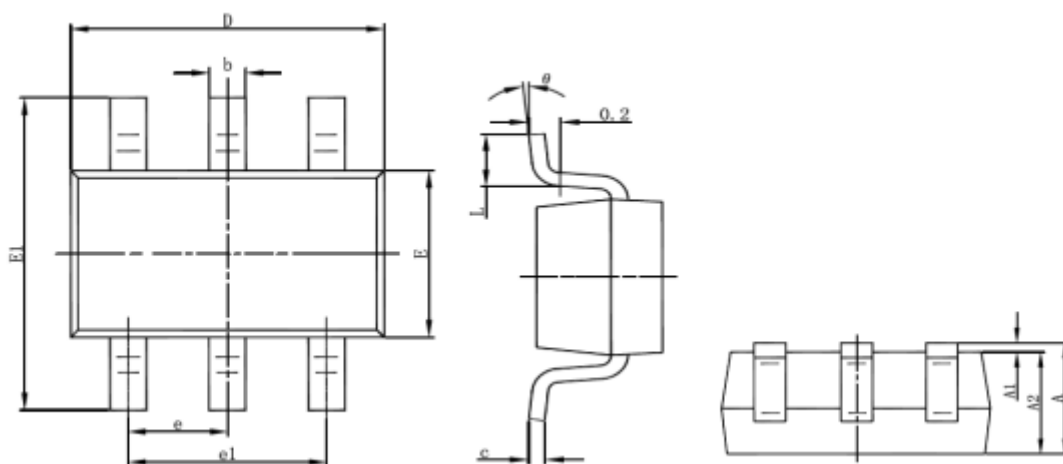
**ABSOLUTE MAXIMUM RATING**

Symbol	Parameter	Maximum	Units
V_{DP1}	DP1data line input voltage	0.3~7V	V
V_{DM1}	DM1 data line input voltage	0.3~7V	V
V_{DP2}	DP2 data line input voltage	0.3~7V	V
V_{DM2}	DM2 data line input voltage	0.3~7V	V
V_{IN}	input voltage of IN	0.3~7V	V
V_{HBM}	ESD Voltage (Human body model)	2	KV
V_{MM}	ESD Voltage (Machine model)	200	V
T_A	Operating Junction temperature	-40~120	°C
T_S	Storage temperature range	-55~150	°C

ELECTRICAL CHARACTERISTICS

Symbol	Test Conditions	Min	Typ	Max	Unit
I_{IN}	$V_{IN}=5V$		155	200	uA
UVLO					
V_{UVLO}		3.9	4.1	4.3	V
V_{UVLO}			100		mV
BC 1.2 DCP Mode (Short Mode)					
R_{DPM_SHORT1}	$V_{DP1}=0.8V, I_{DM1}=1mA$		157	200	Ω
R_{DCHG_SHORT1}	$V_{DP1}=0.8V$	350	656	1150	K Ω
$V_{DPL_TH_DETACH1}$		0.31	0.33	0.35	V
V_{hyst}			50		mV
R_{DPM_SHORT2}	$V_{DP2}=0.8V, I_{DM2}=1mA$		157	200	Ω
R_{DCHG_SHORT2}	$V_{DP2}=0.8V$	350	656	1150	K Ω
$V_{DPL_TH_DETACH2}$		0.31	0.33	0.35	V
Divider Mode					
$V_{DP1_2.7V}$	$V_{IN}=5V$	2.57	2.7	2.84	V
V_{DM1_2V}	$V_{IN}=5V$	1.9	2.0	2.1	V
R_{DP1_PAD1}	$I_{DP1}=-5uA$	24	30	36	K Ω
R_{DM1_PAD1}	$I_{DP1}=-5uA$	24	30	36	K Ω
$V_{DP2_2.7V}$	$V_{IN}=5V$	2.57	2.7	2.84	V
V_{DM2_2V}	$V_{IN}=5V$	1.9	2.0	2.1	V
R_{DP2_PAD1}	$I_{DP2}=-5uA$	24	30	36	K Ω
R_{DM2_PAD1}	$I_{DP2}=-5uA$	24	30	36	K Ω
1.2V / 1.2V Mode					
$V_{DP1_1.2V}$	$V_{IN}=5V$	1.12	1.2	1.28	V
$V_{DM1_1.2V}$	$V_{IN}=5V$	1.12	1.2	1.28	V
R_{DP1_PAD2}	$I_{DP1}=-5uA$	80	102	130	K Ω
R_{DM1_PAD2}	$I_{DP1}=-5uA$	80	102	130	K Ω
$V_{DP2_1.2V}$	$V_{IN}=5V$	1.12	1.2	1.28	V
$V_{DM2_1.2V}$	$V_{IN}=5V$	1.12	1.2	1.28	V
R_{DP2_PAD2}	$I_{DP2}=-5uA$	80	102	130	K Ω
R_{DM2_PAD2}	$I_{DP2}=-5uA$	80	102	130	K Ω
$V_{DP2_2.7V}$	$V_{IN}=5V$	2.57	2.7	2.84	V

OUTLINE DRAWING (SOT23-6)



Symbol	Dimensions in Millimeters		Dimensions in Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950 (BSC)		0.037 (BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°