

Proposal of Product

2X QuickCharger: USB Quick Charging Gender



2013.5

What is the 2X Quick Charger?

2X Quick Charger provides the fast recharging capability when you want to recharge smart phones or tablets using your standard USB cable in your desktop or lap top computer. The charging speed will be faster 2- to 4-times than the standard USB cable connection. And also built-in **Over Current Protection** circuit gives safe operation even in the Old PC.



Supporting Devices:

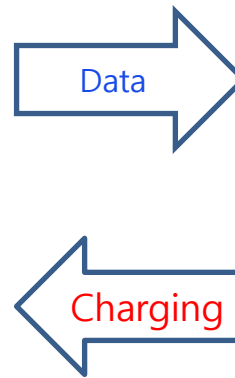
iPhone, iPad, Galaxy Tab, Galaxy S and most of Smartphones and Tablets.

Very Simple operation and easy to use

After plugging in the male end into the PC USB port, and then plugging in the standard USB cable into the 2X Quick Charger, quick recharging is automatically started. If you want to transfer the data, just push the gender's button. And then Data Mode(**BLUE** LED) will be started.



Charging Mode
(DCP)



Data Mode
(CDP or SDP)

Principle (1)

- ❖ According to USB Battery Charging Specification Rev. 1.2, there are 3-modes:
 - ✓ SDP(Standard Downstream Port), CDP(Charging Downstream Port), DCP(Dedicated Charging Port)
- ❖ The recent smartphones/tablets check the type of USB port plugged in, and draw proper current as the followings:

SDP (old PC)	➔	low current (~0.5A)
CDP (recent PC)	➔	higher current (~1.5A)
DCP (charger)	➔	highest current (in case of iPad: 2A)



Old PCs

SDP



Recent PCs

SDP/CDP



Chargers

DCP



Old Devices

SDP/DCP



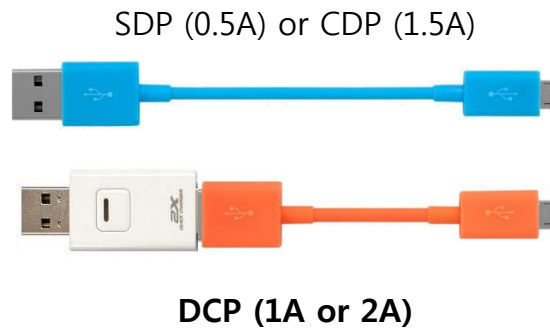
Recent Devices

SDP/CDP/DCP



Principle (2)

- ❖ Actually, the PCs are stronger beyond the standard.
 - ✓ Most of PCs provide over 1A current although USB 2.0 current limit is 0.5A.
- ❖ The 2X QuickCharger fakes port type as a charger(DCP) to draw more current.



- ❖ And the 2X QuickCharger is safe and versatile.
 - ✓ Automatically switch back to SDP to protect USB port of PC even if Over-Current happens.
 - ✓ Supports SDP, CDP and DCP for data communication/charging.
 - ✓ In case of smart phones that support CDP such as Galaxy Note2 and Galaxy S3, the charging speed is almost same to Charging Mode even though 2X QuickCharger is in Data Mode.

** Technically, the actual functionalities and specifications are more complicated.*

The Specification

Item	Specification
Input Voltage	DC 5V
Charging Output Current	2000mA(Max) @ DC5V Apple IPAD @ 2A Charging Current Support
Standard	USB Battery Charging Specification Rev 1.2 Compliant
Power Consumption	1.5mA@5V
Features	Support SDP, CDP, DCP Handshaking Protocol Support Apple 2A mode : Supports iPad2/New iPad high current charge Support Samsung Galaxy Tab Charging Mode
Dimension	20.0x43.5x9.5 mm
Weight	7.7g

Charging Time Comparison

Unit: hour:min

Vendor	LG	Google	Samsung	Samsung	Samsung	Samsung	Samsung	Apple	Apple	Apple	Apple
Model	Optimus Black	Nexus S	Galaxy S	Galaxy S2	Galaxy Note	Galaxy Note2	Galaxy Tab 10.1	iPhone3	iPhone4	iPAD	iPAD mini
Battery Capacity	1540 mAh	1500 mAh	1500 mAh	1850 mAh	2500 mAh	3100 mAh	7000 mAh	1150 mAh	1450 mAh	6930 mAh	4490 mAh
Battery Start	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%	50%
Battery End	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%
USB	2:04	2:03	2:35	2:15	2:40	3:43	N/A	1:12	1:43	N/A	N/A
2X QuickCharger(DCP)	1:15	1:50	1:29	1:21	1:51	1:44	4:03	0:42	1:25	3:13	1:45
2X QuickCharger(CDP/SDP)	2:04	2:03	2:35	2:15	2:40	1:42	7:50	1:12	1:43	6:08	1:47
AC Adapter	1:17	1:54	1:25	1:20	1:50	1:06	2:17	0:45	1:25	2:40	1:40

* Test Host PC : HP 8530P/HP NX6330

* Please use an original cable for the device. It can affect the charging time.

* According to PC (system), the charging time can be affected and changed.

* The latest SmartPhone or Tablet (ex. Galaxy Note2, iPAD mini, Optimus G, Galaxy S3, iPhone5, Optimus 2X..) supporting CDP do support a fast charging even in CDP Mode (**Blue LED**: Data mode) like DCP mode (**RED LED**: Charging mode)

* In case Galaxy Tab 10.1 battery is discharged completely, it start normal charging after 15~20 minutes.

Charging Current Test Data (1)

No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Category	Mobile Phone	Mobile Phone	Mobile Phone	Mobile Phone	Mobile Phone	Mobile Phone	Mobile Phone	Mobile Phone	Mobile Phone	Mobile Phone	Mobile Phone	Mobile Phone	Mobile Phone	Mobile Phone	Mobile Phone	Mobile Phone	Mobile Phone	Mobile Phone
Make	Apple	Apple	Apple	Apple	Asus	Blackberry	Blackberry	Blackberry	Blackberry	Garmin-Asus	HTC	HTC	HTC	HTC	LG	LG	LG	LG
Model	iPhone 3GS 16GB	iPhone 4 16GB	iPhone 4S 32GB	iPhone 5 16GB	Padfone2	Bold 9000	Curve 3G	Storm2 9520	Tour 9630	G60	Raider 4G (X710e)	Thunder bolt	Touch Cruise	Touch Diamond 2	KM555	KP500	Optimus 2X (SU-660)	Optimus 3D SU-760)
Battery	25%	50%	22%	65%	81%	80%	20%	65%	50%	90%	50%	60%	90%	70%	90%	70%	50%	50%
2XQC(DCP)	630mA	720mA	970mA	940mA	850mA	800mA	860mA	1160mA	1140mA	490mA	650mA	820mA	650mA	620mA	640mA	330mA	870mA	860mA
2XQC(CDP)	430mA	500mA	500mA	940mA	850mA	480mA	480mA	480mA	480mA	490mA	470mA	480mA	480mA	440mA	400mA	330mA	870mA	410mA
USB	430mA	500mA	500mA	500mA	850mA	480mA	480mA	480mA	480mA	490mA	470mA	480mA	480mA	440mA	400mA	330mA	410mA	410mA

No.	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
Category	Mobile Phone	Mobile Phone	Mobile Phone	Mobile Phone	Mobile Phone	Mobile Phone	Mobile Phone	Mobile Phone	Mobile Phone	Mobile Phone	Mobile Phone	Mobile Phone	Mobile Phone	Mobile Phone	Mobile Phone	Mobile Phone	Mobile Phone	Mobile Phone
Make	LG	LG	LG	LG	Motorola	Nokia	Nokia	Nokia	Samsung	Samsung	Samsung	Samsung	Samsung	Samsung	Samsung	Samsung	Samsung	Samsung
Model	Optimus One p500	Optimus G (F180S)	Optimus Vu2 (F200S)	PRADA (SU-540)	Atrix 4G	Lumia N900	N8	N85	Galaxy A	Galaxy Ace2 (GT-I8160)	Galaxy Note (GT-N7003)	Galaxy R	Galaxy S (GT-I9000)	Galaxy S hopin (SHW-M190S)	Galaxy S2	Galaxy S3	OMNIA II i8000	Google Nexus S (GT-I9020)
Battery	80%	18%	18%	46%	30%	17%	33%	70%	20%	88%	80%	72%	60%	60%	70%	80%	77%	68%
2XQC(DCP)	690mA	600mA	620mA	700mA	1200mA	850mA	900mA	690mA	580mA	580mA	720mA	670mA	580mA	580mA	670mA	930mA	590mA	610mA
2XQC(CDP)	480mA	600mA	600mA	400mA	440mA	470mA	800mA	480mA	580mA	580mA	470mA	420mA	400mA	400mA	420mA	930mA	440mA	490mA
USB	480mA	460mA	450mA	400mA	440mA	470mA	460mA	480mA	460mA	460mA	470mA	420mA	380mA	400mA	420mA	440mA	440mA	490mA

Charging Current Test Data (2)

No.	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54
Category	Mobile Phone	Mobile Phone	Mobile Phone	Mobile Phone	Portable Media Player	Portable Media Player	Portable Media Player	Portable Media Player	Portable Media Player	Portable Media Player	Portable Media Player	Portable Media Player	Portable Media Player	Portable Media Player	Portable Media Player	Portable Media Player	Portable Media Player	Portable Media Player
Make	Samsung	Sony Ericson	SKY Pantech	SKY Pantech	Apple	Apple	Apple	Apple	Apple	Apple	Apple	Apple	Apple	Creative	iRiver	Kenwood	Transcend	Transcend
Model	S8500	Xperia P layer	Vega R3 (IM-A850S)	Vega S5 (IM-A840S)	iPod mini 1G 4GB (A1051)	iPod nano 3G 8GB	iPod nano 4G 16GB (A1285)	iPod nano 5G 16GB (A1320)	iPod nano 6G 8GB (A1366)	iPod shuffle 2G 1GB	iPod shuffle 4G 2GB (A1373)	iPod touch 2G 16GB (A1288)	iPod touch 4G 32GB	ZEN X-Fi2 16GB	E300	MG-F508 8GB	TS4GMP330	MP650 2GB
Battery	42%	40%	18%	18%	60%	20%	30%	15%	10%	40%	20%	15%	15%	60%	90%	70%	90%	10%
2XQC(DCP)	610mA	950mA	450mA	540mA	340mA	280mA	250mA	210mA	120mA	100mA	68mA	620mA	710mA	490mA	200mA	280mA	140mA	170mA
2XQC(CDP)	490mA	460mA	450mA	540mA	450mA	300mA	250mA	230mA	130mA	150mA	81mA	500mA	500mA	400mA	220mA	270mA	160mA	180mA
USB	490mA	460mA	450mA	540mA	450mA	300mA	250mA	230mA	130mA	150mA	81mA	500mA	500mA	400mA	220mA	270mA	160mA	180mA

No.	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70
Category	Portable Media Player	Tablet PC	Tablet PC	Tablet PC	Tablet PC	Tablet PC	Tablet PC	Tablet PC	Tablet PC	Tablet PC	Tablet PC	Tablet PC	Tablet PC	Tablet PC	Tablet PC	Tablet PC
Make	Samsung	Apple	Apple	Apple	Apple	Apple	Amazon	Google	Samsung	Samsung	Samsung	Samsung	Samsung	Samsung	Samsung	View Sonic
Model	YP-P3	iPad mini wifi 16GB (A1432)	iPad1 Wifi+3G 16GB	iPad2 Wifi+3G 16GB	The New iPad Wifi 32GB	iPad4 Wifi 16GB (A1458)	Kindle Fire 7"	Nexus7 Wifi 16GB (ME370T)	Galaxy Note 10.1" (SHW-M480S)	Galaxy Tab 7" (GT-P1000)	Galaxy Tab 7.7" Wifi 16GB (GT-P6810)	Galaxy Tab 8.9" Wifi+LTE 32GB (SHV-E140S)	Galaxy Tab 10.1" Wifi 16GB (GT-P7510)	Galaxy Tab2 7" Wifi+3G 16GB (GT-P3100)	Galaxy Tab 2 10.1" Wifi 16GB (GT-P5110)	View Pad 7e
Battery	90%	30%	30%	22%	23%	22%	8%	78%	80%	13%	42%	80%	30%	55%	50%	58%
2XQC(DCP)	600mA	1510mA	840mA	1580mA	1780mA	1970mA	640mA	1140mA	780mA	1300mA	1140mA	1130mA	1380mA	1290mA	1470mA	460mA
2XQC(CDP)	450mA	1420mA	490mA	490mA	490mA	1430mA	640mA	1140mA	460mA	480mA	440mA	420mA	440mA	480mA	460mA	490mA
USB	450mA	490mA	490mA	490mA	490mA	470mA	460mA	450mA	460mA	480mA	440mA	420mA	440mA	480mA	460mA	490mA

* Test Host PC : Lenovo ThinkPad X200

* This data was made to check the max current capacity of each smartphone in our test environment.

THANK YOU

