

Distributor Sales Guideline

May, 2016



Corporate Profile

Headquarters: San Jose, CA, USA

Founded: 1997, IPO in 2004 (NASDAQ: MPWR)

Revenue: \$330M (Estimated Y2015 revenue)

Employees: 1000+

Products: 600+ products in DC-DC, AC-DC, lighting, motor drivers, battery chargers, mPower, module, etc.

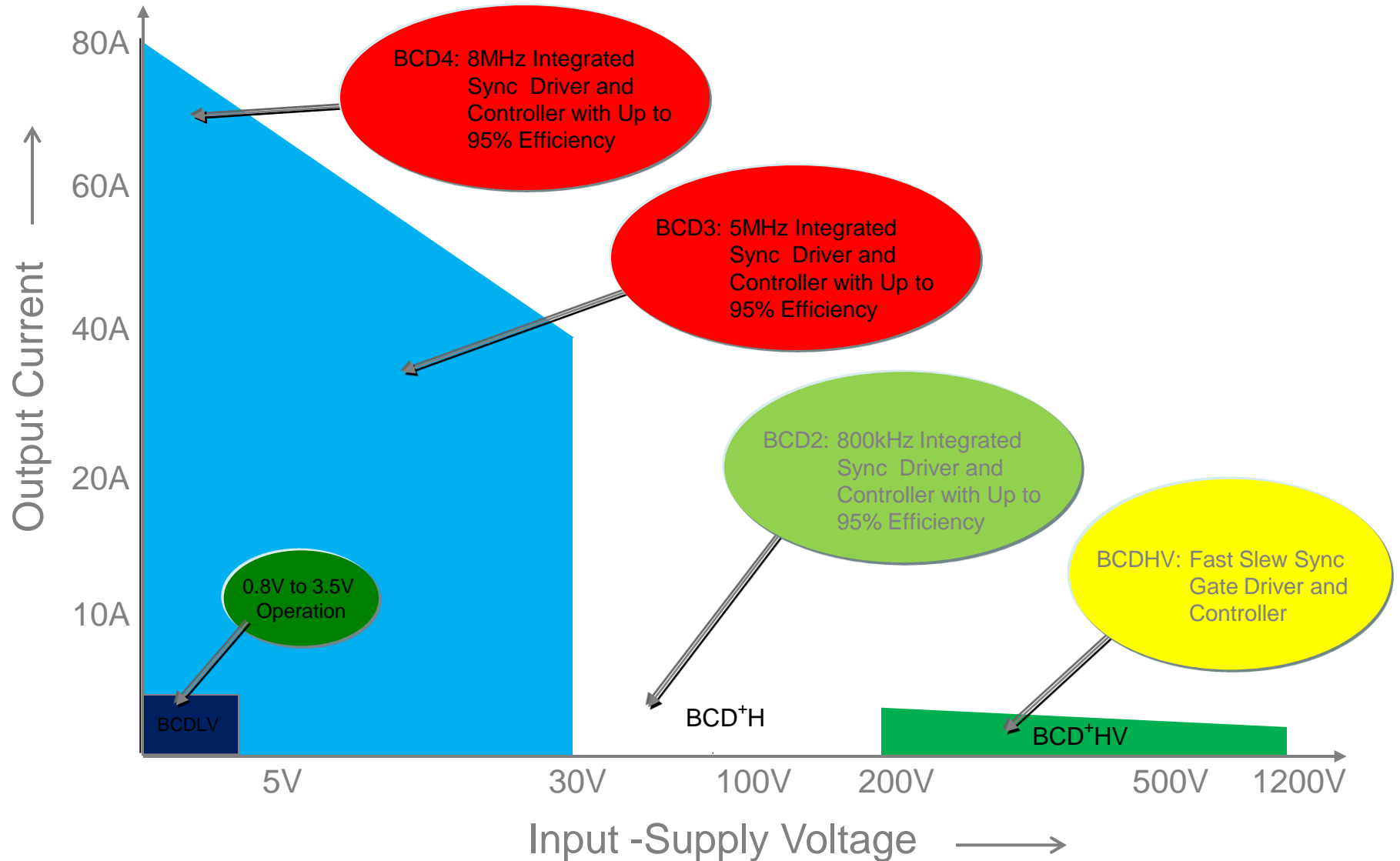
Technology: Best-in-class in speed and power density.
Proprietary BCD process customized for high-speed power conversion



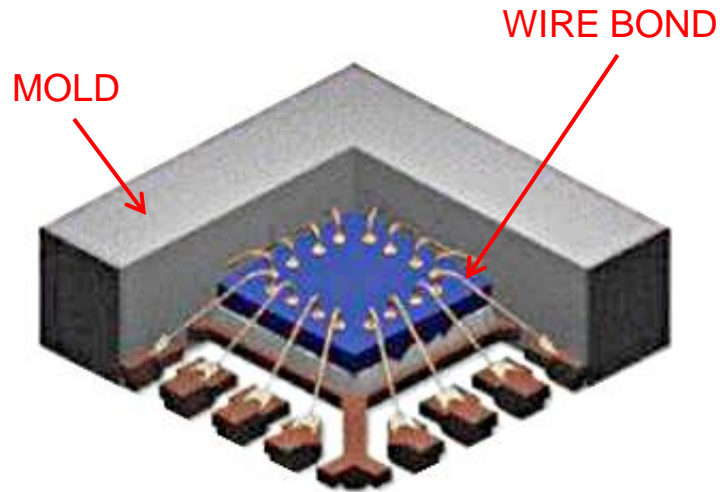
Silicon Valley Headquarters



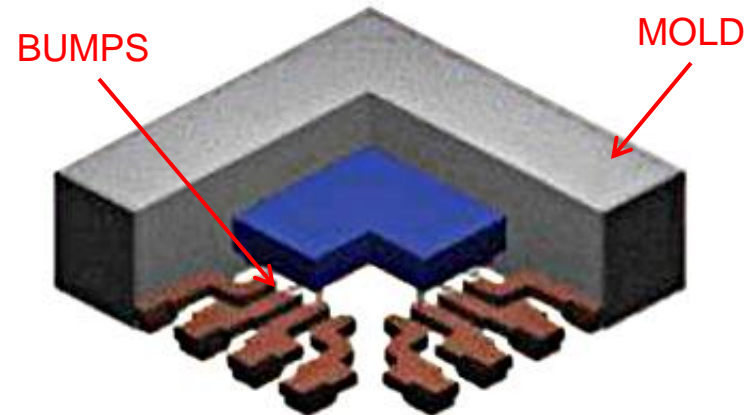
Proprietary Unmatched Technical Capabilities Best-in-Class Performance



Wire Bond



Mesh Connect[™]
(No Wire Bond)



High Reliability, Small Form Factor, Better Heat Design, No Inductance, and Faster Response





- 8" & 12" Fabs
- Capable of 0.09um for 8" Fab and 28nm for 12" Fab
- Qualified Capacity on 8": 12000 W/M



- 8" Fab
- Capable of 0.25um
- Qualified Capacity on 8": 15000 W/M



- 8" Fab
- Capable of 0.11um
- Qualified Capacity on 8": 12000 W/M





Partners with Leading Assembly Houses



ASE GROUP

No. 1 Assembler Worldwide



One of the Largest Assemblers in China



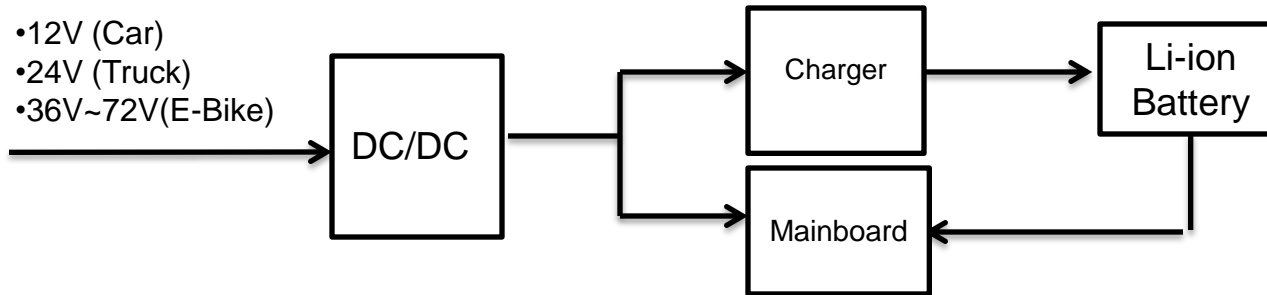
Top 10 Assembler Worldwide



□什么是Car Tracker ?

❖ Car Tracker就是带GPS的手机，通过手机GPRS发送GPS位置信息。

❖ 按应用类型分汽车(Car/Truck)用及电动车(E-Bike)用。汽车电池电压为12V或24V，DC-DC耐压是36~60V之间;电动车的电池电压为36V/48V/64V/72V或以上，对IC的耐压要求为85V以上。

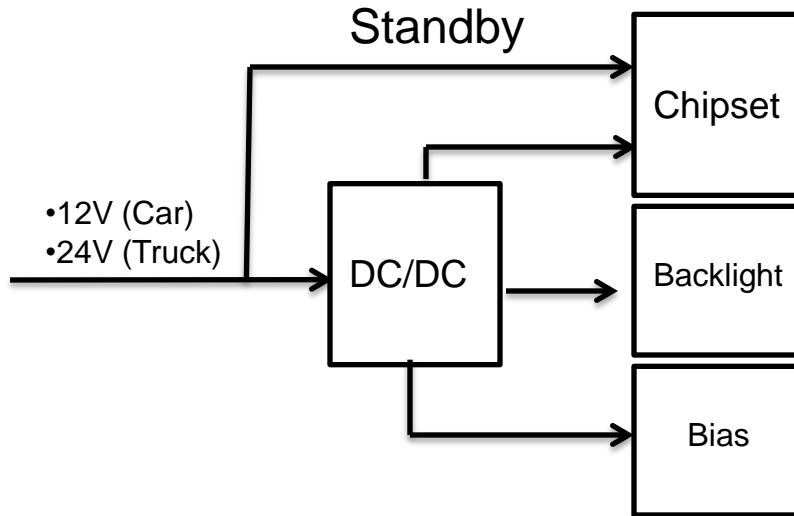


App.	Current	P/N
Charger	1A	MP2602
	2A	MP2625B

App.	Type	Vin Max	P/N	Current	Frequency	Competitor
DC/DC	Car	55V	MP24943	3A	100KHz	
	E-Bike	80V	MP46885	0.5A		LM5008
			MP4688	1A		LM5008
		100V	MP4689	1A		LM5008



Automotive Application –Car DVD/GPS



App.	App.	P/N	Descpt.
Standby	Standby	MP(Q)2013	150mA
		MP(Q)2016	30mA
Backligh	Backligh	MP3307	8~10"
		MP3309	8~10"
		MP3302	<7"
Bias	Bias	MP3202	<7"
		MP1540	
		MP1541	
		MP1530	
		MP5610 (Output +/-5V)	
Standby	Standby	MP(Q)2013	150mA
		MP(Q)2019	300mA

App.	Vin Max	P/N	Current	Type	Schottky	Frequency	Package	Advantage	Competitor
DC/DC	30V	MP9942	2A	Syn.	No Need	410KHz(Fixed/Ext.Syn)	SOT-23-8	Low BOM Cost,High Efficiency	TPS54331/LM43602
		MP9943	3A	Syn.	No Need	410KHz(Fixed/Ext.Syn)	QFN	Low BOM Cost,High Efficiency	TPS54331/LM43602
	36V	MP(Q)4420H	2A	Syn.	No Need	410KHz(Fixed/Ext.Syn)	SOT-23-8	Low BOM Cost,High Efficiency	TPS54331/LM43602
		MP(Q)4423H	3A	Syn.	No Need	410KHz(Fixed/Ext.Syn)	QFN	Low BOM Cost,High Efficiency	TPS5430
		MP(Q)4430	3A	Syn.	No Need	2.5MHz(Adj.)	QFN	Low IQ	TPS5431
		MPQ4470	5A	Syn.	No Need	1MHz(Adj.)	QFN	small Inductor/save Size	
	50V	MP9447	5A	Syn.	No Need	650KHz(Adj.)	QFN	small Inductor/save Size	
		MP(Q)2565	2.5A	Non-Syn.	Need	4MHz(Adj.)	QFN8/SO-8	small Inductor/save Size	
	55V	MP24943	3A	Non-Syn.	Need	100KHz(Fixed)	SO-8	small Inductor/save Size	
		MP(Q)4560	2A	Non-Syn.	Need	2MHz(Adj.)	QFN10/SO-8	small Inductor/save Size	
	60V	MP(Q)4570	3A	Syn.	No Need	520KHz(Fixed/Ext. Syn)	TSSOP-20	60V,Synchronous	TPS54361

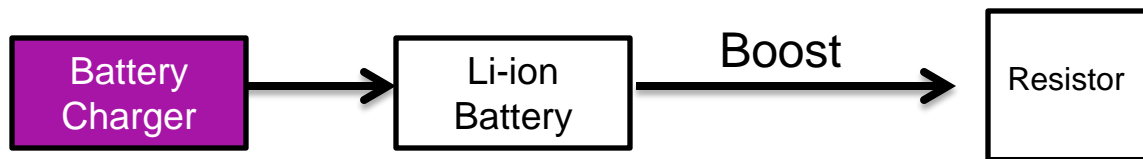
Remarks: MPQ for Pre-Market;



DC-DC Apple to Apple Comparison

TPS54431/MP9943 Apple to Apple Comparison				
No.	Spec	TPS54331	MP9943	Comment
1	Vin(max)	30V	36V	
2	Topology	Non-Synchronous	Synchronous	非同步的DC-DC对PCB Layout要求很高，同时也对纹波处理有更高的要求，会增加滤波电容的成本(如用多级滤波并选用陶瓷材质等低DCR电容)
3	Rds(High Side)max	180mohm@5V	105mohm @5V	内阻大会增加发热
4	Rds(Low Side)max	Schottky Diode	75mohm	外挂肖特基会增加发热及纹波
5	Efficiency	65%	78%	Vin=24V,Vo=3.3 @100mA
6	Power Good	No	Yes	可将PG信号提供给MCU处理，优化系统的稳定性
7	External Frequency	No	200KHz-2MHz	MP9943可外部同步时钟，避免同频干扰的发生
8	Current Limit	Typical 5.8A Max N/A	Typical 4.4A Max 5.5A	TPS54331的过流保护点离散性太大，容易造成后端已经发生短路，而IC过流反应过于迟钝，倒导烧掉后端的负载!
9	Duty Cycle(min)	90%	92%	

MPS® E-Cigarette



Descp.	P/N	Remarks	Competitor	Competition
18-20W	MP3423	3.3V->5V @3.5A	XR6504	SY7066 support 2A only
25-35W	MP3427	3.3V->6V @5-6A	SY7315	
25-70W	MP3428	3.3V->6V @5-6A	N/A	
150W	MP6529	*2Pcs	N/A	
1Cell	MP2602	Linear Charger		
2Cells	MP2615	PWM Charger		
2Cells	MP2639A	PWM,Battery Balance		BD8864,SY6982,ACT2804



2Cell Battery Charger Comparison

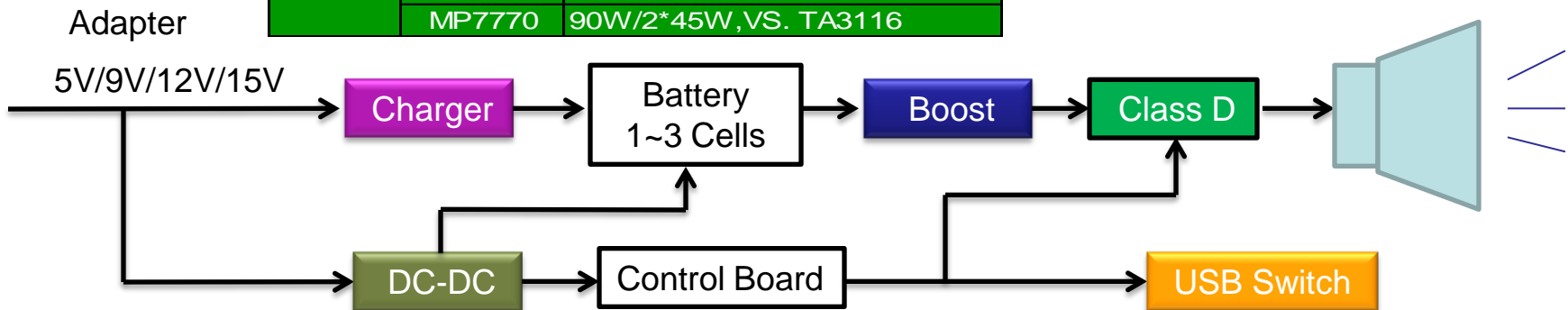
Part Number	MP2639A	BD8664	SY6982	ACT2804
Manufacture	MPS	ROHM	Silergy	Active-Semi
ABS Max VIN	16V	7V	16V	6V
Operation VIN	4V-5.75V	4.1V-5.5V	4.5V-5.5V	4.5V-5.5V
Max ICHG	2.5A	Unknown	2A	1.8A
Max IIN_LMT	3A	1.5A	Adaptive	3A
Max IOUT_LMT	5A	No Discharge Func.	No Discharge Func.	3.4A
LS_FET + HS_FET Ron	19m/16m	60m/external diode	80m/40m	Unknown
Blocking FET Ron	10m	70m	40m	Unknown
Sense Resistor	Not required	Required	Not required	Required
Battery NTC Protection	Yes	No	Yes	Yes
Safety Timer	Yes	No	Yes	No
Loop Compensation	Internal	External	Internal	Internal
Input Voltage Loop	Yes	No	Yes	No
Reverse Discharging Function	Yes	No	No	Yes
LEDs Indication for Battery Capability	Yes	No	No	Yes
Battery Current Monitor	Yes	No	No	No
Integrated Battery Balance	Yes	No	No	Yes
Package	QFN26 4x4	CSP 2.2 x 2.2	QFN16 2x3	QFN40 5x5

MPS[®] Bluetooth Audio

Charger	MP2636	1Cell,Power Bank,2.1A
	MP2637	1Cell,Power Bank,2.4A
	MP2633	1Cell,Power Bank,1.5A
	MP2615	2Cell, 9V~ input
	MP2639A	2Cell, 5V input,Battery Balance
	MP26123	3Cells
	MP2619	3Cells,Power Path

Boost	MP3421	1Cell->5V @2.5A
	MP3422	1Cell-->5V @2.5A
	MP3423	1Cell->5V @3.5A
	MP3213	1Cell-> 5V @5-12V @500mA
	MP3428(A)	1~2Cell-->12-19V@1-2A
	MP3908	6V/12V-->12V+

Class-D	MP7751	Pin to Pin TPA3110
	MP7752	
	MP7748S	
	MP7770	90W/2*45W,VS. TA3116



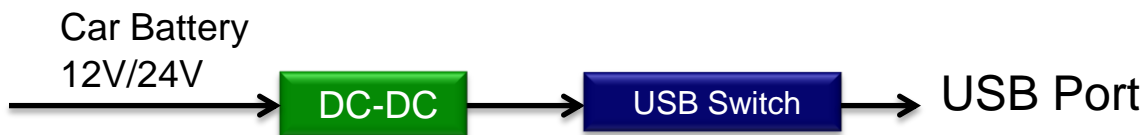
DC-DC	MP1470/1A	12V-->5V/3.3V @2/3A
	MP1494/5	12V-->5V/3.3V@2/3A
	MP1652/3	12V-->5V/3.3V @2/3A
	MP2314/5	12V-->5V/3.3V @2/3A
	MP9942/3	24V-->5V/3.3V @2/3A
	MP9928	24V-->5V/3.3V @5A~

USB Switch	MP62551	60mA-1.7A(SOT/QFN)
	MP62550	60mA-1.7A(SOT/QFN)
	MP5016	Reverse Current Block,Vs. SY6875
	MP5075	SOT523(1.6mx1.6m),Vs. SY6280
	MP5090	Dual 3A/2A(TFQN/CSP)
	MP5092	Dual 2A/3A/5.5A(QFN)
	MP5095	Dual 2.5ASOT23-8)

MPS[®] Car Charger



Output	Type	Current	MPS Opportunity
Normal (5V)	Single	1.2A	MP2315S, MP9942
		2.4A	MP9499, MP9943
	Dual	2.4A+1.2A(3.6A)	MP5442/MP5402
		2.4A+2.4A(4.8A)	MP5402/MP9492 (D+/D-, USB Switch)/MP9447
		3A+3A	MP5408/MP9497
4	2.4A*4(9.6A)	MP9928+MOSFET/MP2918	
QC (5V/9V/12V)	Single	2.4A	MP2499



Type	Current	MPS Opportunity
Single	2A	MP5075, MP5016
	3A	MP5075
Dual	2A/3A	MP5095, MP5092, MP5090

P/N	Vin Range	Current	Specification	Focusing	Successful story
MP2315S	4.5-24V	3A	SOT-23, Synchronous, 500KHz	Low end Market	LLAB
MP9943	4.5-36V	3A	Wide input Range, QFN, Synchronous, 410KHz	High end market	Philips
MP2499	4.5-36V	3A	Good EMI, Line drop compensation, Support QC(5V/9V/12V output)	QC3.0, EMI requirement	
MP9499	4.5-36V	3A	Good EMI, Line drop compensation	Low end Market	
MP9447	4.5-36V	5A	650KHz(Adjustable), high efficiency	High end market	Anker
MP5442	4.5-36V	5A	Good EMI, Line drop compensation, D+/D-	EMI requirement	EMI requirement
MP5402	4.5-36V	4.8A	Good EMI, Line drop compensation, D+/D-, USB Switch inside	EMI requirement	Anker/360/Xiaomi
MP9492	4.5-28V	4.8A	Good EMI, Line drop compensation, D+/D-, USB Switch inside	EMI requirement	Anker/360/Xiaomi
MP5408	4.5-36V	4.8A-6A	Good EMI, Line drop compensation, D+/D-, USB Switch inside, Type C	EMI requirement	New
MP9497	4.5-28V	4.8A-6A	Good EMI, Line drop compensation, D+/D-, USB Switch inside	EMI requirement	New



Car Charger Competition

Brand	ACT	UPI	AX	MPS
IC	ACT4528/9	UP9602/\$0.3	AX3070/\$0.18	MP2499M/\$0.3
Diode/MOSFET	Diode/\$0.02	N/A	MOS/\$0.12	0/NA
Inductor	22uH/\$0.1	22uH/\$0.1	22uH/\$0.1	11uH/\$0.08
Other Components	\$0.15	\$0.15	\$0.15	\$0.15
QC2.0/3.0	QC2.0	QC2.0	QC2.0/3.0	QC2.0/3.0
Identification IC	N/A	N/A	Yes/\$0.12	Yes/\$0.12
BOM Cost	\$0.55	\$0.55	\$0.67	\$0.65

•MP2499 focus on QC2.0/3.0

Brand	AVT	UPI	MPS
IC	A2106V/\$0.14	UP9602/\$0.3	MP9499M/\$0.19
Diode	Diode/\$0.02	N/A	N/A
Inductor	47uH/\$0.12	22uH/\$0.1	11uH/\$0.08
Other Components	\$0.12	\$0.12	\$0.12
Thermal Performance	Good	Bad	Good
BOM Cost	\$0.40	\$0.36	\$0.39

•MP9499 focus on Single Port 2.4A

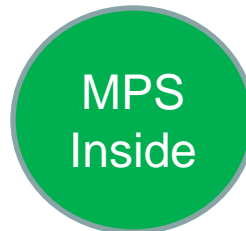
MPS[®] Wall Charger



Function	P/N	Specification
AC-DC	HFC0500	Up to 80W
Synchronous Rectify	MP6901	Better Efficiency
	MP6902	
USB Switch	MP5075	SOT523(1.6mx1.6m),PK SY6280
	MP5016	Reverse Current Block,Vs SY6875
	MP5090	Dual 3A/2A(TFQN/CSP)
	MP5092	Dual 2A/3A/5.5A(QFN)
	MP5095	Dual 2.5A(SOT23-8)
Quick Charger	MP2229	Buck Solution
	MP3428A	5V/9V/12V up to 2.5A

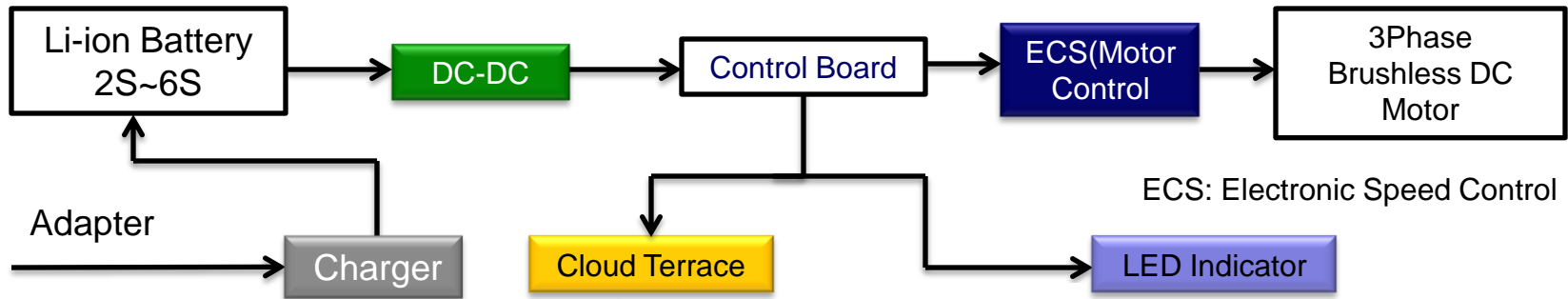


ANKER[®]
Smart just got easier

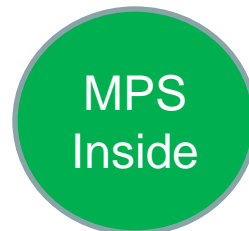




Drones (Unmanned Plane)



P/N	Specf.
MP4420	30V @2A
MP4423H	36V @3A
MP4423	30V @3A
MP4423H	36V @3A
MPQ4430	36V @3.5A
MP9473	36V @3.5A
MP4470	36V @5A, high efficiency
MP9447	36V @5A, high efficiency
MP4570	55V @3A
MP2908A	60V controller
MPM3606	21V @3A, Inductor built in
MPM3610	21V @1A, Inductor built in
MPM3620	24V @3A, Inductor built in
MPM3510A	36V @1A, Inductor built in
MPM3515	36V @1.5A, Inductor built in
MP2451	36V @0.6A
MP2456	50V @0.5A



P/N	Specf.
MP2639A	2Cells, with Boost, Battery Ballance
MP2615	2Cells
MP26123	3Cells
MP2619	3Cells with Power Path
MP1907	100V driver
MP6530	3Phase pre driver, 60V, (=MP1907*3), need 3Pcs/Set
MP6532	55V, MP6530+Hall Interface
MP6534	55V, MP6530+500mA Buck
MP6536	26V, Pre driver+6 MOSFETs(=6530+MOSFET)
MA700	Angle Sensor
MP24893	36V, 1A



Typical Powerbank Solution



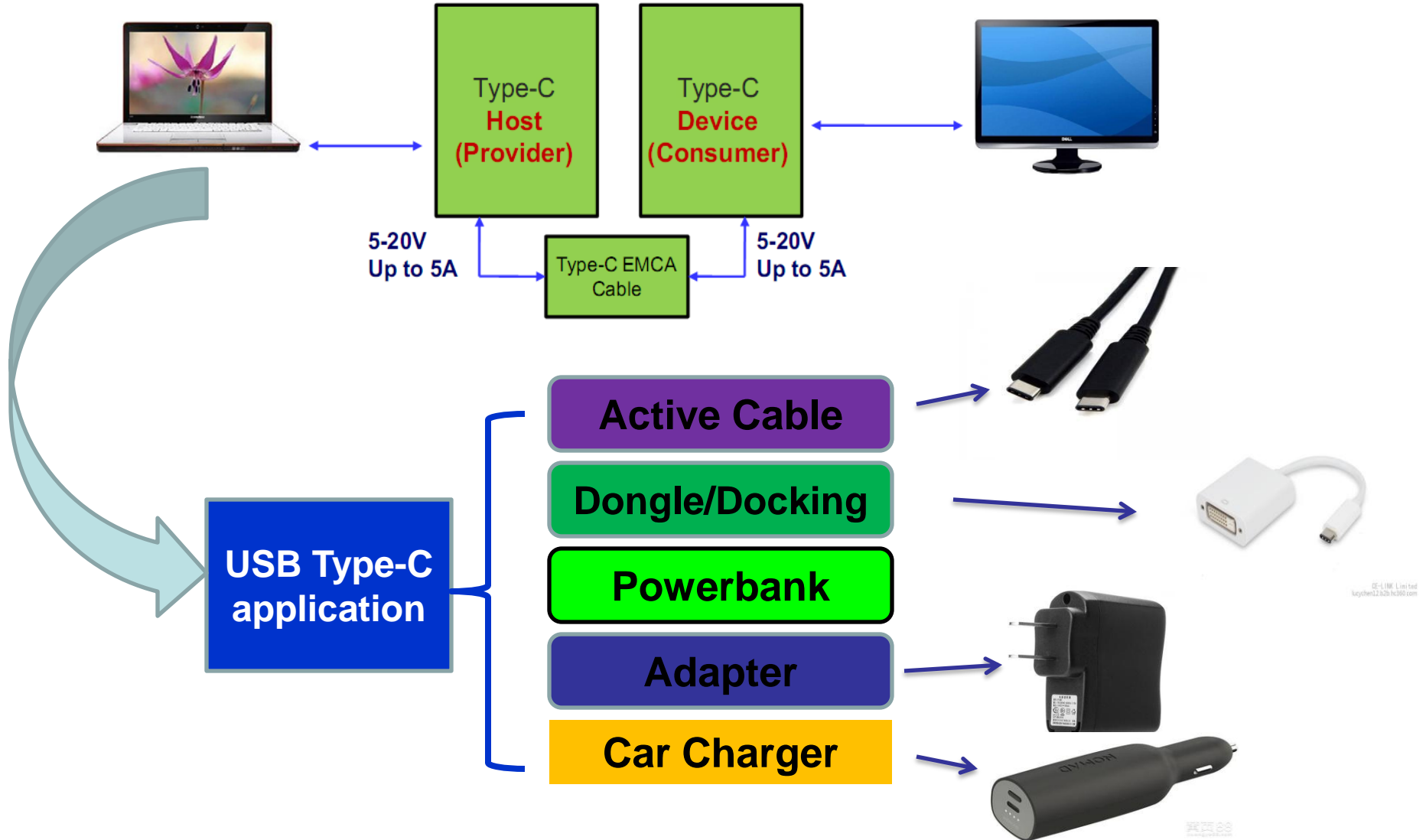
Standard 5V:Ports/Current/Cells...

Quick Charger:QC2.0/3.0, PEP(MTK)...

Type-C powerbank: W/ or W/O PD Controller



Type	MPS Solution	Competitor	Specification
Standard	MP2633+MP3422+MP5075	BQ24195+TPS61235	Charge=2A,Output=1A+2.1A
	MP2637+MP3422+MP5075	SY6926+SY7066,RT9481+RT4812	Charge=2.5A,Output=2.1A+2.1A
	MP2636/MP2615+MP3423	SY6929+SY7066	Charge=2.5A,Output=3A
	MP2690/91	IP5209/JW3606	3IN1,Output=2.1A/2.4A
	MP2632	ACT2813	3IN1,Output=3A
	MP2639A	SY6982E/ACT2804	2 cells,Output <=4.2A
Quick Charger	MP2624/28+MP3428A	BQ25895+TPS61088	Need + QC Interface IC
	MP2638	IP5318/HE43021	All in 1 with QC,Sampling
Type C	MP2636+MP3423	BQ24195+TPS61235,SY6926+SY7066	W/O PD,3A
	MP2632,MP2639A	ACT2813,SY6982E/ACT2804	W/O PD,3A
	MP2624+MP3428A	BQ25895+TPS61088	W/ PD,Vout max=15V
	MP2650	ISL9237,SC8801,LM5175	W/ PD, Buck or boost, 5/12/20V,Sampling in Q3

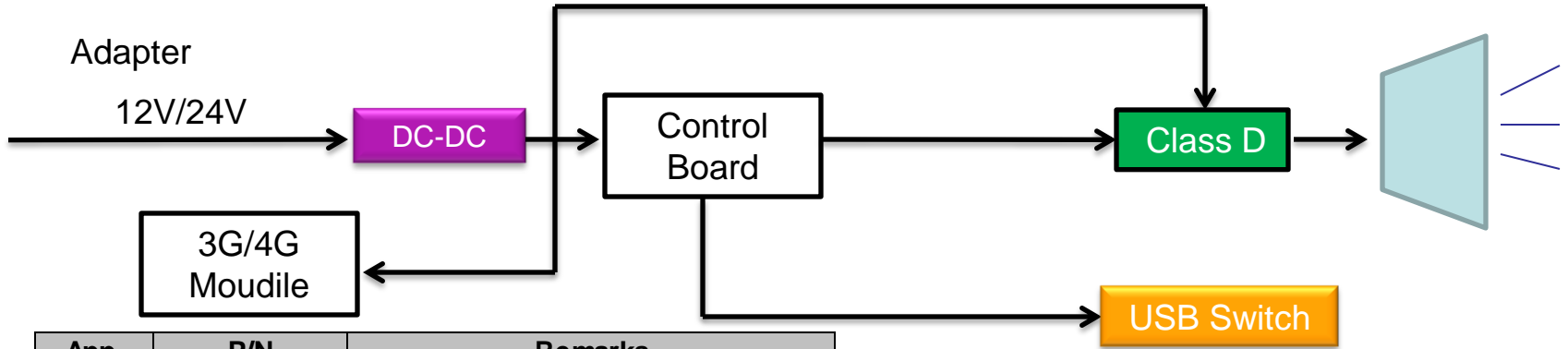


MPS[®] Type C MPS Solution

Type	MPS Solution	Competitor	Specification
Adapter	HFC0500+MP6960		
	/MP023+MP6906	PI SC122*/Iwatt169*	Vin=90~265vac, Vout=5/12/20V, Iout=2.25A
Active Cable	MP2388	SY8088/89	3.3V@1A for PD controller
Dongle/Docking	MP3426+MP8756	SY7304+8366H	5V regulator, Vin<=5V
	MP2263*3A/8756*6A+MP3422	SY8366+SY7065	5V regulator, Vin>=5V
	MP5016	FPF2411	OCP/OVP
	MP1601*2/MP2122	SY8008/BDC/EUP	5V->3.3V, 5V->1.2V
	MP3422	SY7065	Boost to 5V
	MP5455	N/A	Backup power at the Transient time(eg: 5V To 12/20V) in case of power off on Controller side
Powerbank	MP2636/MP2624/MP2650	BQ24195/BQ25895/SY6926	Charger
	MP5016	FPF2411	OCP/OVP
	MP3428A/MP9184	TPS61088/SY7315	Boost to 5V@3A or 9V/12V/15V@2A
	MP2263	SY8366	5V regulator
CLA	MP2499M	AC452*/UPI9602/AX3070	QC2.0, 3.0/Type C 5V@3A
	MP5408M	AX3070/UP9602/AC452*	Dual ports Type C 5V@3A, full features for CLA



TV/STB/OTT Control Board



App.	P/N	Remarks
DC-DC	MP1601	5V-->3.3V @1A, for STB/OTT
	MP1605	5V-->3.3V@2A(Peak), for STBOTT
	MP2131	5V->3.3V @4A, for OTT(3G/4G)
	MP2147	5V->3.3V @4A, for OTT
	MP2145	5V->3.3V @6A, for OTT
	MP1652	12V-->5V/3.3V @2A
	MP1653	12V-->5V/3.3V @3A
	MP1654	12V-->5V/3.3V @4A
Class-D	MP7751	Pin to Pin TPA3110
	MP7752	
	MP7748S	
USB Switch	MP62551	USB Load Switch
	MP62550	USB Load Switch
	MP5016	Reverse Current Block,Vs SY6875
	MP5075	SOT523(1.6mx1.6m),PK SY6280
	MP5090	Dual 3A/2A(TFQN/CSP)
	MP5092	Dual 2A/3A/5.5A(QFN)
	MP5095	Dual 2.5A(SOT23-8)





Thanks!