

RM6603SC
USB PD 3.0 and QC 3.0 Controller
V1.0

reactor-micro

TABLE OF CONTENT

1. Features.....	3
2. Application.....	3
3. Ordering Information	3
4. Block Diagram (Reference)	4
5. Pin Assignment	4
6. Pin Descriptions	4
7. Absolute Maximum Ratings (Ref.)	5
8. Recommended Operating Conditions (Ref.)	5
9. Electrical Characteristics.....	6
10. Typical Application Circuit	7
11. Package Dimensions.....	8

1. Features

- On-chip Multiple Charging Standard Identifications:
 - USB Power Delivery 3.0 Fix PDO, PPS (3.3V~21V) & CC Logic
 - Qualcomm® Quick Charge 2.0 and 3.0 Class A
 - USB **Battery Charging v1.2** on DP & DM pins (5V/1.5A, 7.5W)
 - Support Chinese Telecommunication Industrial Standard **YD/T 1591-2009**
 - Apple mode (**5V/2.4A** on DP & DM pins, 12W)
 - Support Samsung® Adaptive Fast Charging (**AFC**)
 - Support HiSilicon® Fast Charge Protocol (**FCP**)
 - HiSilicon® Super Charge Protocol (**SCP v1**)
 - Proprietary Low voltage direct charging protocol
- Housekeeping function for OVP, UVP and OTP
- 2kV HBM and 1000V sCDM ESD Level
- -40°C ~ +125°C Operating Temperature
- Package: ESOP-8
- RoHS compliant and Halogen free

2. Application

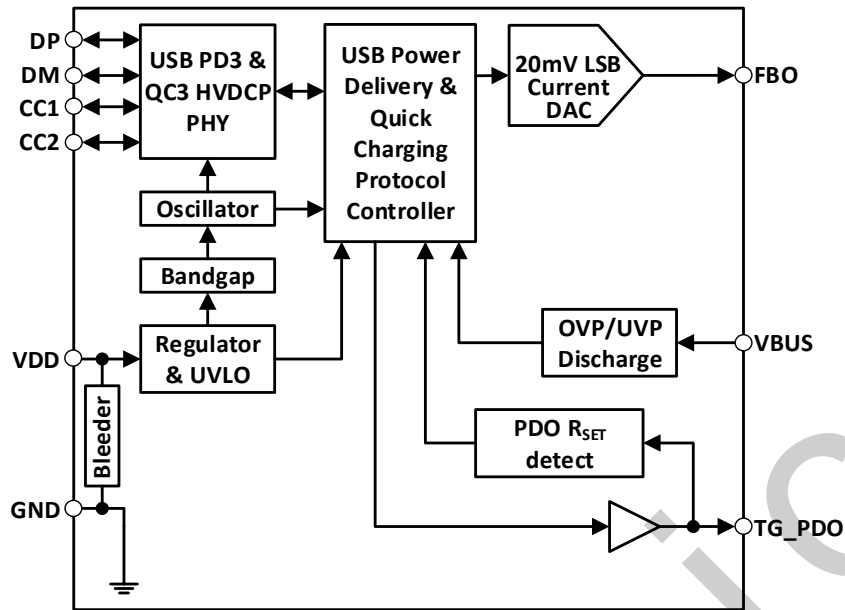
- Wall Adapter
- Car Charger
- Portable Power Bank
- USB Power Plugs

3. Ordering Information

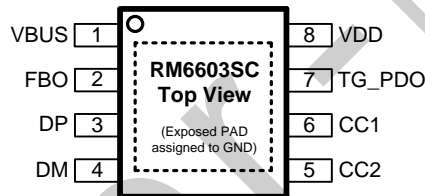
Part Number	Package	Packing	Description
RM6603SC	ESOP8	Coil	Halogen-Free

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4. Block Diagram (Reference)



5. Pin Assignment



6. Pin Descriptions

Pin Name	Pin Number	Descriptions
VBUS	1	VBUS voltage discharge and monitor.
FBO	2	Output voltage control pin. Current sink/source function for FB node.
DP	3	USB D+ data line of Type-C.
DM	4	USB D- data line of Type-C.
CC2	5	USB Type-C Configuration channel signal2.
CC1	6	USB Type-C Configuration channel signal1.
TG_PDO	7	P-MOSFET gate node control pin.
VDD	8	Power supply input pin.
GND	Exposed PAD	Ground pin. The exposed pad must be connected to GND and well solder to a large PCB copper area for maximum power dissipation.

7. Absolute Maximum Ratings (Ref.)

Exceeding the Absolute Maximum Ratings may damage the device.

Characteristics	Symbol	Rating	Unit
Supply Voltage	V_{DD}	-0.3 to 7	V
DP, DM	DP, DM	-0.3 to 24	V
CC1, CC2	CC1, CC2	-0.3 to 24	V
TG_PDO, VBUSC	-	-0.3 to 24	V
Maximum Junction Temperature	T_J	150	°C
Storage Temperature	T_S	-60 ~ 150	°C
Lead Temperature (Soldering, 10 sec.)	-	260	°C
ESD Withstand Voltage :			
- Human Body Mode	HBM	2000	V
- Socket Charge Device Mode	sCDM	1000	V

8. Recommended Operating Conditions (Ref.)

The device is not guaranteed to operate beyond the Maximum Recommended Operating.

Parameter	Rating
Supply Input Voltage (V_{DD})	3.2V to 6.0V
Operating Temperature Range	-40°C to +125°C

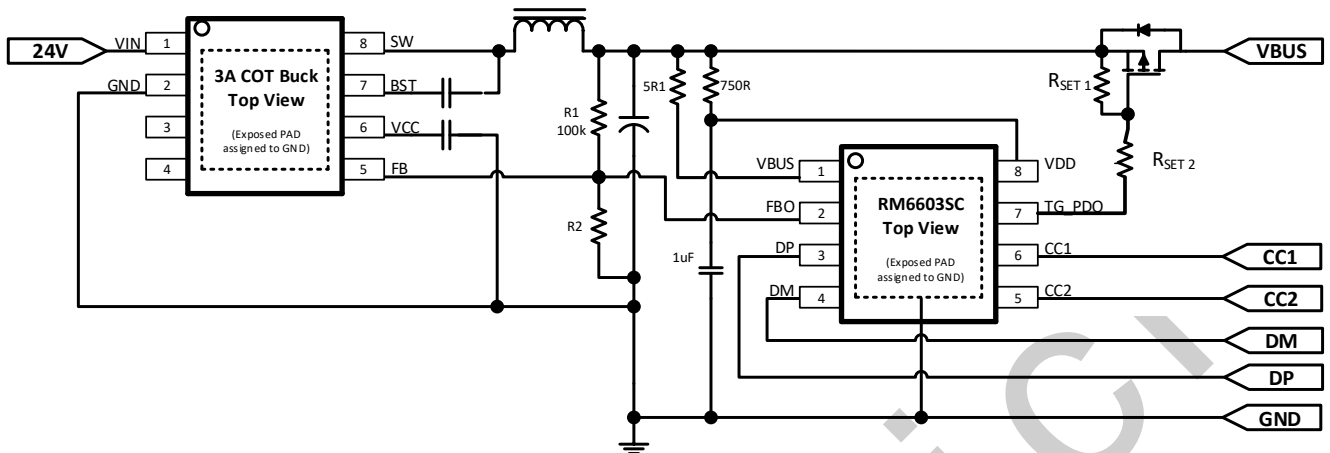
9. Electrical Characteristics

(VDD=5V, TA=25°C and the recommended supply voltage range, unless otherwise specified.)

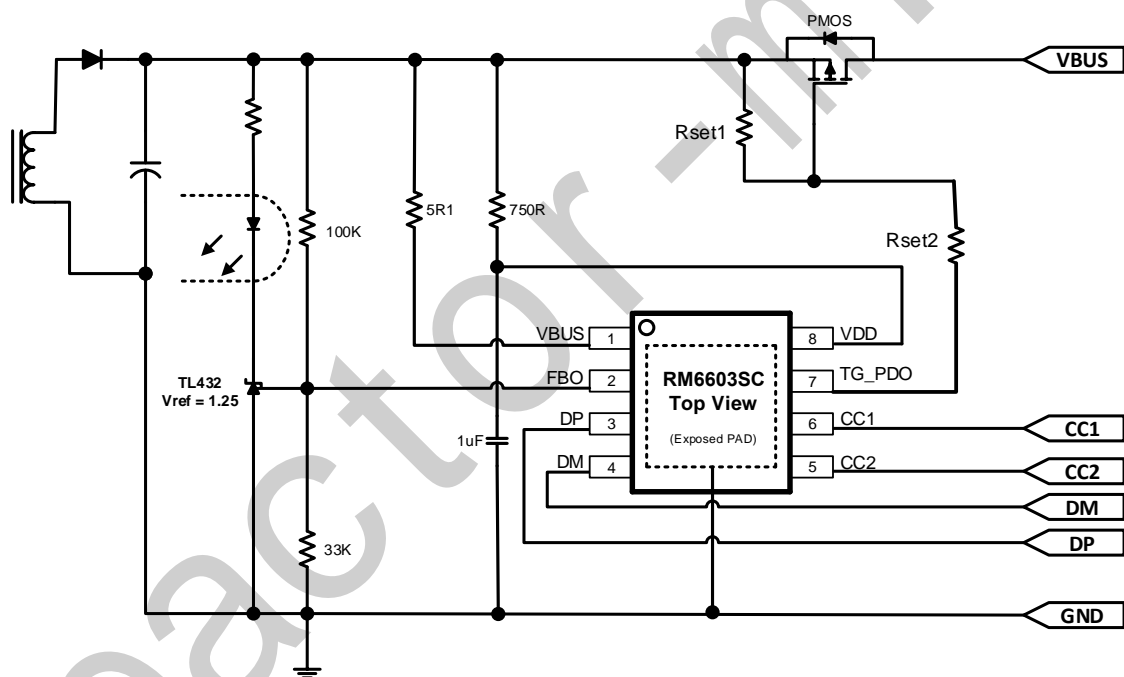
Characteristics	Symbol	Conditions	MIN	TYP	MAX	Unit
Supply Input						
Supply Voltage Range	V _{DD}		3.2		6.0	V
Input UVP Threshold	V _{UVLO}	V _{DD} rising.		2.7		V
Input UVP Hysteresis		V _{DD} falling.		0.2		V
VDD Supply Current	I _{DD}			1.7		mA
PMOS Driver						
PMOS Driver pull-down resistance				1		kΩ
VBUS						
VBUS Discharge Current				60		mA
DCP PHY						
DP DM OV Threshold		In QC Mode		4		V
CCOV Rising				1.04* V _{DD}		V
CCOV Falling				V _{DD}		V
High Voltage Dedicated Charging Port (HVDCP)						
Data Detect Voltage			0.25	0.325	0.4	V
Output Voltage Selection Reference			1.8	2.0	2.2	V
DP Pin High Glitch Filter Time			1000	1250	1500	ms
DP Pin Low Glitch Filter Time				1		ms
Output Voltage Glitch Filter Time			20	40	60	ms
DM Pin Pull-Down Resistance				20		kΩ
Continuous Mode Glitch Filter Time			100		200	μs
DP Pin Leakage Resistance			300	500	800	kΩ
Switch SW1 On-Resistance					40	Ω
UP/Down Current Step				2		μA

10. Typical Application Circuit

Car Charger



Wall Charger



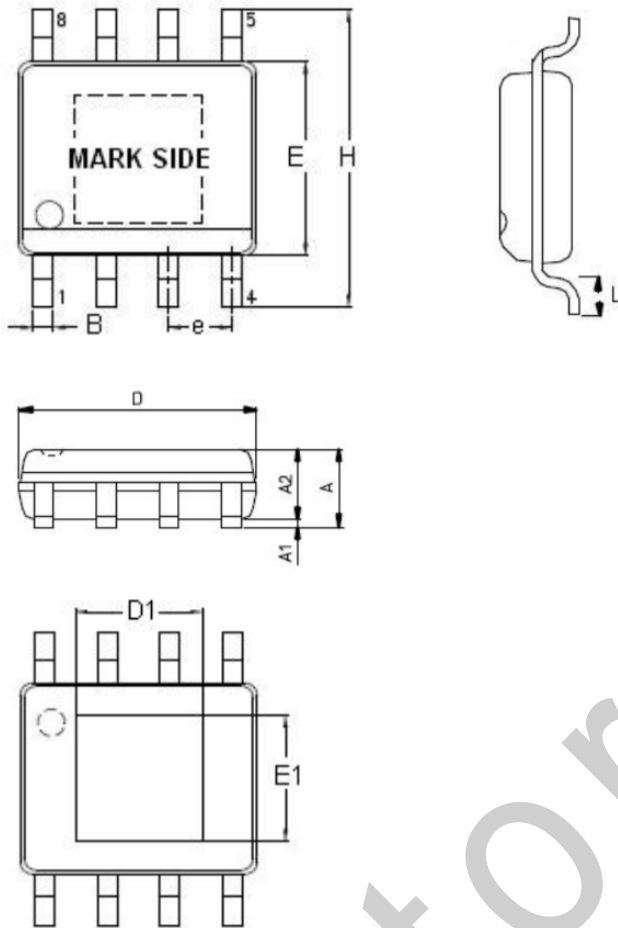
Rset Truth Table

R _{SET1} +R _{SET2}	Max Power Rating	PDO Detail
33K	33W	5V/3A, 9V/3A, 12V/2.5A, 15V/2A, 20V/1.5A, 3.3V-11V/3A
68K	36W	5V/3A, 9V/3A, 12V/3A, 15V/2.4A, 20V/1.8A, 3.3V-11V/3A
91K	48W	5V/3A, 9V/3A, 12V/3A, 15V/3A, 20V/2.25A, 3.3V-16V/3A
120K	65W	5V/3A, 9V/3A, 12V/3A, 15V/3A, 20V/3.25A, 3.3V-21V/3A

Note : R_{SET2} is used to ease the stress on PMOS' V_{GS}, recommended R_{SET1} to R_{SET2} ratio shall set from 10 to 1.

11. Package Dimensions

SOP-8 (Exposed Pad) Package (Unit: mm)



SYMBOLS UNIT	DIMENSION IN MILLIMETER	
	MIN	MAX
A	1.25	1.70
A1	0.00	0.15
A2	1.25	1.55
B	0.31	0.51
D	4.80	5.00
D1	3.04	3.50
E	3.80	4.00
E1	2.15	2.41
e	1.20	1.34
H	5.80	6.20
L	0.40	1.27

Note: Followed From JEDEC MO-012-E.