

## 16 -Channel PWM Constant Current LED Sink IC

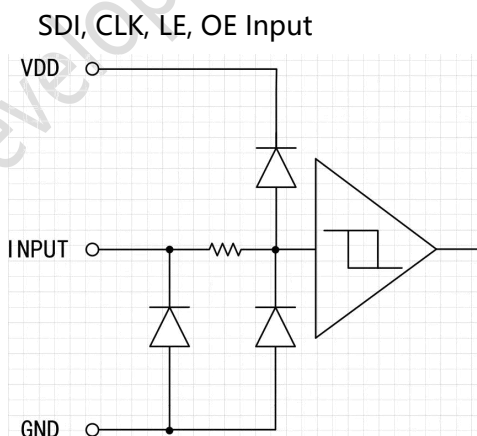
### FEATURES

- 16 Constant-Current Channels
- Scan Range: 1~64 scans randomly
- Operation Power Supply Range: 3.5V ~ 5.5V
- Operation Temperature Range: -40° ~ 85°
- Constant Current Range:
  - 0.5mA ~ 18.6mA @ VDS=0.3V
  - 1mA ~ 36mA @ VDS=0.6V
  - IOU=IGAIN\*18/Rext
- Current accuracy between chips:
  - $\pm 1.0\%$ (Typical) $\pm 2.0\%$ (Max) @ VDS=0.3V
  - $\pm 1.2\%$ (Typical) $\pm 2.5\%$ (Max) @ VDS=0.6V
- Current accuracy between channels:
  - $\pm 1.2\%$ (Typical) $\pm 2.5\%$ (Max) @ VDS=0.3V
  - $\pm 0.8\%$ (Typical) $\pm 1.5\%$ (Max) @ VDS=0.6V
- High gray independent display, High display refresh rate
- Enhancement: improve low gray scale/dim at first line/low ghost/high and low gray coupling/coupling between modules and some poor display.
- Integrated PLL to be GCLK. Compared with external GCLK, Frequency range is wider, and EMI is lower

### APPLICATIONS

- LED Display

### I/O Equivalent Circuits

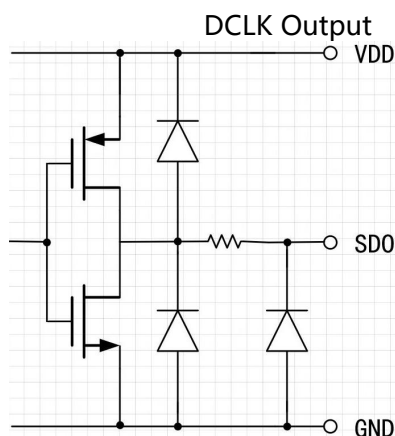


### GENERAL DESCRIPTION

DP3264S is a PWM constant current sink LED chip for LED display with low turning point, integrated high-precision current generation circuit technology, to achieve chip-to-chip current error less than 2%, and with variety exclusive technology to improve the LED display effect, bring more development in LED display field.

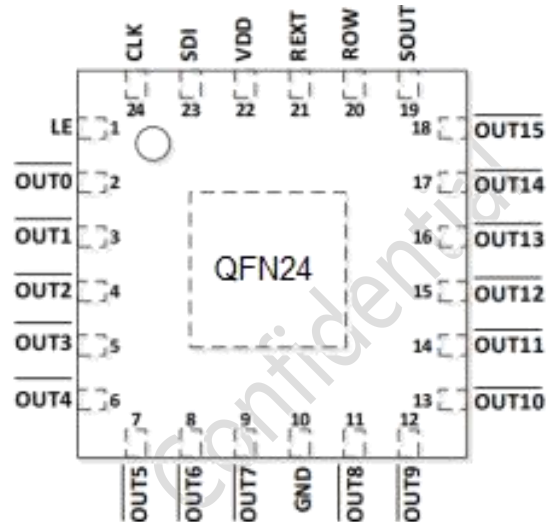
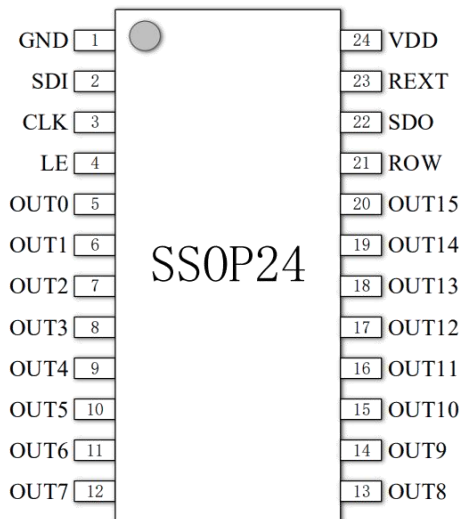
### ORDERING INFORMATION

Name	Package	Mode	Reels	MSL
DP3264S	QSOP24	Tape	4000	MSL=3
	QFN24	Tape	5000	



## PRODUCT DESCRIPTION

### ➤ Pin Configuration



### ➤ Pin Description

Pin No.	Pin Name	Function
1	GND	Power Ground
2	SDI	Serial data input
3	CLK	Clock input terminal for data shift and command information
4	LE	Data transfer command input
5 ~ 20	OUT0 ~ OUT15	Constant current output
21	ROW	Scan Line change signal
22	SDO	Serial data output
23	REXT	Constant-current value setting. Connection to an external resistor to GND
24	VDD	Power-supply voltage

Pin No.	Pin Name	Function(QFN 24)
1	LE	Data transfer command input
2~9,11~18	OUT0 ~ OUT15	Constant current output
10	GND	Power Ground
19	SDO	Serial data output
20	ROW	Scan Line change signal
21	REXT	Constant-current value setting. Connection to an external resistor to GND
22	VDD	Power-supply voltage
23	SIN	Serial data input
24	CLK	Clock input terminal for data shift and command information

## ➤ Marking Information



QSOP24



QFN24

DP3264S is product name:

XXXXXX The first X represents the last bit of year, for example X is 4 when year is 2014. The second X represents month, using 12 alphabets from A to L. The forth X represents day, using numbers 01 to 31. The last two X represent twafer batch no

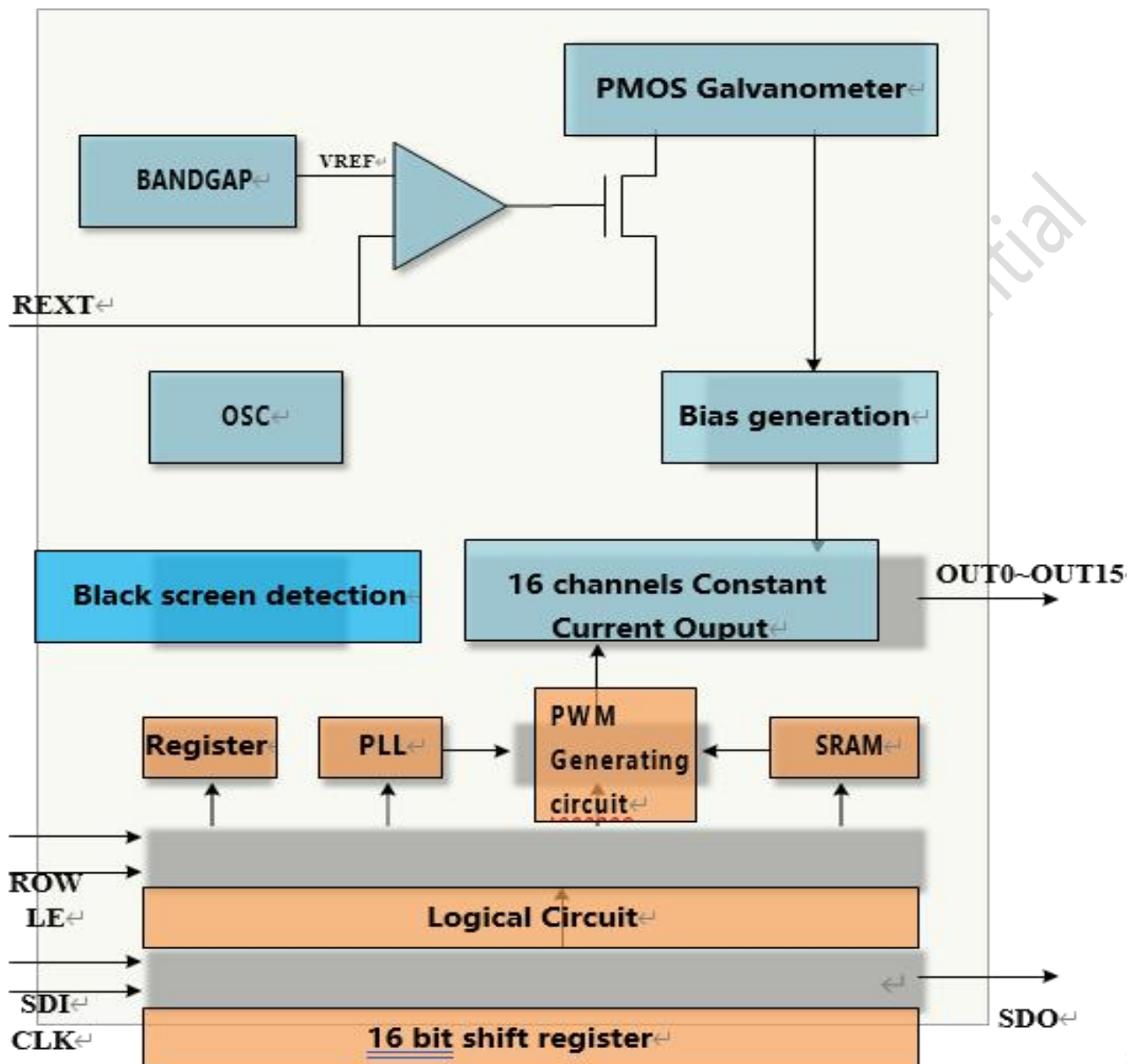
## ➤ Absolute Maximum Ratings<sub>(Ta = 25°C)</sub>

Characteristics	Symbol	Rating	Unit
Supply Voltage	VDD	0 ~ 5.5	V
Input Voltage (All PINs)	VIN	-0.3 ~ VDD+0.3	V
Continuous working output current	IOUT_COT	30	mA
Instantaneous maximum output current	IOUT_MAX	35	mA
Clock frequency	FCLK	20	MHZ
Operation Temperature	Topr	-40 ~ 85	°C
Storage Temperature	Tstg	-50 ~ 150	°C
Human body model (HBM)	VESD	>8	KV

### Note:

1. All the voltage value setting based on GND PIN as reference;
2. Application exceed the above specified value, may cause permanent damage to components, extending the operating life under absolute maximum conditions may reduce the reliability of the components. These are only part of the specified values, and do not support the functional operation of other conditions beyond the specification.
3. SMD components, soldering peak temperature must be lower than 260°C, temperature curve as standard J-STD-020, and factory decides by itself, take the reference by actual situation and solder paste manufacture' s suggestion.

## BLOCK DIAGRAM



**ELECTRICAL CHARACTERISTICS** ( $T_a=25^{\circ}\text{C}$ ,  $V_{DD}=3.5\text{V}\sim 5.0\text{V}$ , if not otherwise noted)

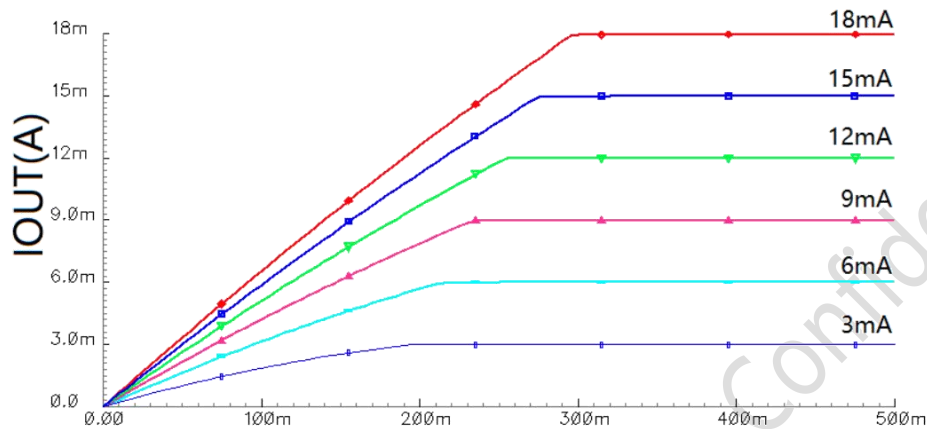
Characteristics	Symbol	Test Conditions	Min	Typ	Max	Unit
Operation Current	IDD(on)	$V_{DD}=3.5\sim 5.0\text{V}$	1.7	3.5	4.5	mA
Max. Output voltage	VOUT(MAX)	OUT 0~OUT 15	-0.5	—	$V_{DD}+0.5$	V
Constant current source output range	IOUT	$V_{DD}=3.5\text{V}\sim 5.0\text{V}$	0.5	—	34.6	mA
Constant current source output range 1	IOUT1	Low transition configuration $V_{DS}\geq 0.3\text{V}$	0.5	—	18.62	mA
Constant current source output range 2	IOUT2	Low transition configuration $V_{DS}\geq 0.6\text{V}$	0.5	—	34.6	mA
Chip-to-Chip output current error	DCHIP	Low transition configuration $V_{DS}\geq 0.3\text{V}$	--	$\pm 1.0$	$\pm 2.0$	%
		Low transition configuration $V_{DS}\geq 0.6\text{V}$	--	$\pm 1.5$	$\pm 2.5$	%
Channel-to-Channel output current error	DCHL	Low transition configuration $V_{DS}\geq 0.3\text{V}$	--	$\pm 1.2$	$\pm 2.5$	%
		Low transition configuration $V_{DS}\geq 0.6\text{V}$	--	$\pm 0.7$	$\pm 1.5$	%
Constant current error/VDS changes	%/ $\Delta V_{DS}$	$V_{DS}=0.3\sim 3.0\text{V}$	--	—	$\pm 1.0$	%/V
Constant current error/VDD changes	%/ $\Delta V_{DD}$	$V_{DD}=3.5\text{V}\sim 5.0\text{V}$	--	—	$\pm 1.0$	%/V
SDO supply current	High level logic output voltage	$V_{DD}=5\text{V}$	--	-22	—	mA
	Low level logic output voltage		--	23	—	mA
Output level	High level logic output voltage	$I_{OH}=-1\text{mA}$	4.6	—	—	V
	Low level logic output voltage	$I_{OL}=1\text{mA}$	--	—	0.4	

**16 -Channel PWM Constant Current LED Sink IC**

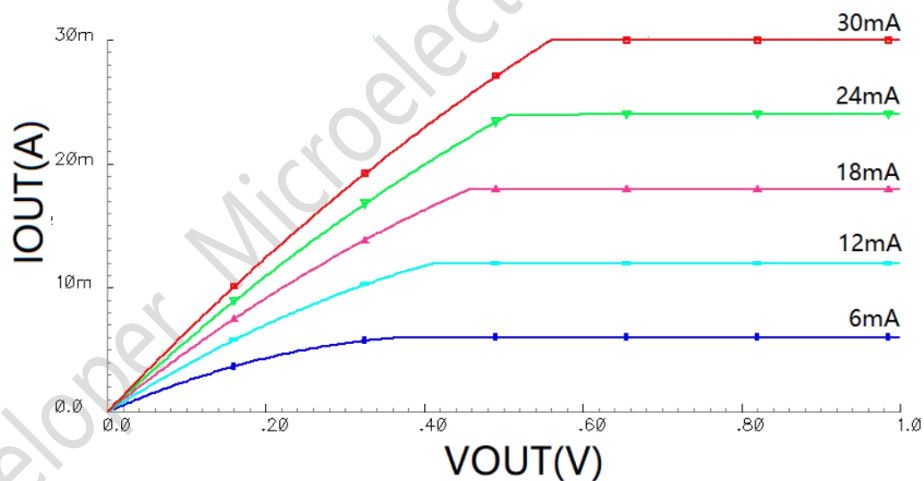
Input flip level	High level logic output voltage		0.7*vdd	—	—	
	Low level logic output voltage		--	—	0.3 *vdd	
CLK-SDO delay	TPHL	VDD=5V, FDCLK=12.5MHz	--	50	—	ns
CLK-SDO delay	TPLH	VDD=5V, FDCLK=12.5MHz	--	50	—	ns
Constant current output rise time	tOR	IOUT=10mA, ΔVOUT=3V	--	45	—	ns
Constant current output falling time	tOF	IOUT=10mA, ΔVOUT=3V	--	35	—	ns

## CONSTANT OUTPUT

$$I_{OUT} = \frac{I_{GAIN} \cdot 18}{R_{ext}}, \quad 12.5\% \leq I_{GAIN} \leq 200\%$$



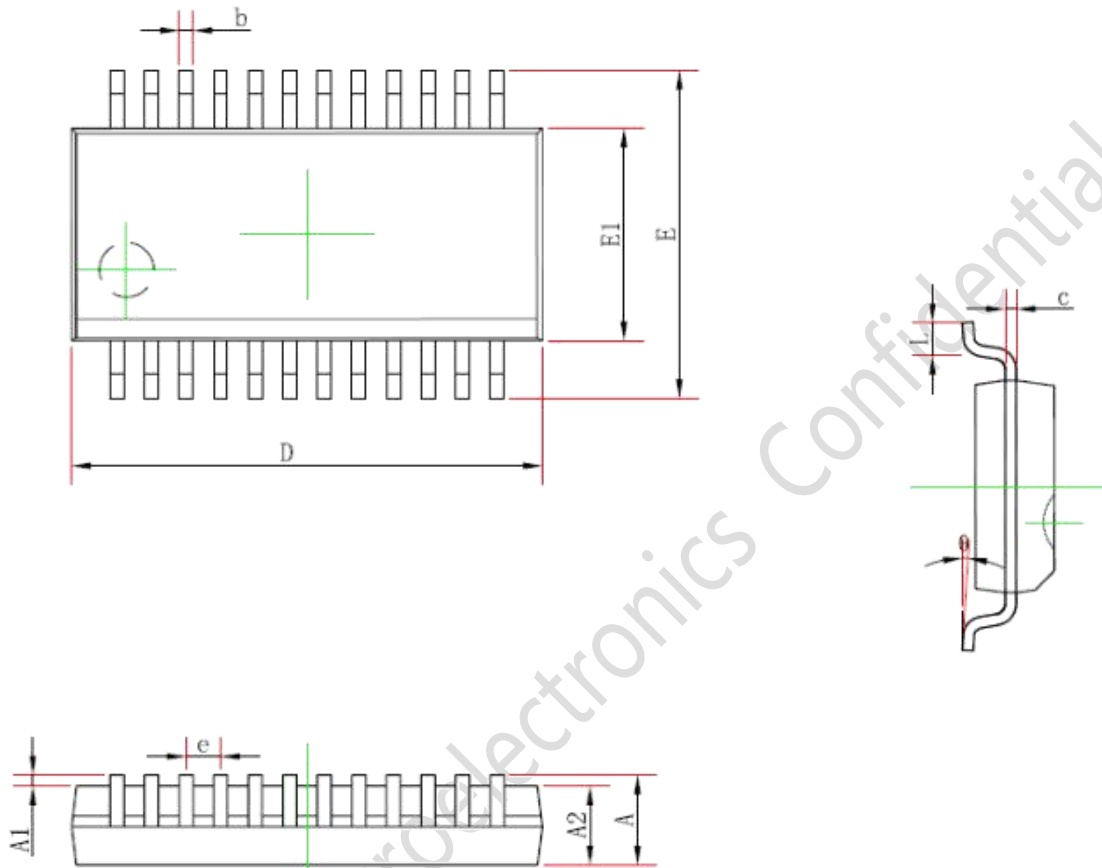
Low turning mode, VDD=3.5V, curve about IOU & VOUT



Standard Model, VDD=3.5V, curve about IOU & VOUT

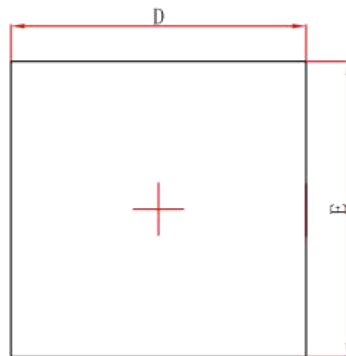
## PACKAGE DIMENSION

QSOP24

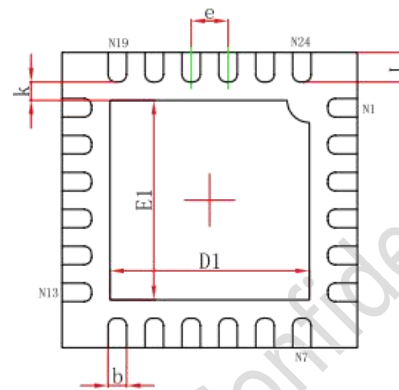


	(mm)	
	(Min)	(Max)
A	—	1.95
A1	0.05	0.35
A2	1.05	—
b	0.1	0.4
c	0.05	0.254
D	8.2	9.2
E1	3.6	4.2
E	5.6	6.5
e	0.635TYP	
L	0.3	1.5
θ	0°	10°

QFNWB4×4-24L (P0.50T0.75/0.85) PACKAGE OUTLINE DIMENSIONS



Top View



Bottom View



Side View

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.700/0.800	0.800/0.900	0.028/0.031	0.031/0.035
A1	0.000	0.050	0.000	0.002
A3	0.203REF.		0.008REF.	
D	3.924	4.076	0.154	0.160
E	3.924	4.076	0.154	0.160
D1	2.600	2.800	0.102	0.110
E1	2.600	2.800	0.102	0.110
k	0.200MIN.		0.008MIN.	
b	0.200	0.300	0.008	0.012
e	0.500TYP.		0.020TYP.	
L	0.324	0.476	0.013	0.019

---

## OFFICIAL ANNOUNCEMENT

Division I will ensure the accuracy and reliability of the product specification document, but we reserve the right to independently modify the content of the specification document without prior notice to the customer. Before placing an order, customers should contact us to obtain the latest relevant information and verify that this information is complete and up-to-date. All product sales are subject to the sales terms and conditions provided by our company at the time of order confirmation.

Division I will periodically update the content of this document. Actual product parameters may vary due to differences in models or other factors. This document does not serve as any express or implied guarantee or authorization.

The product specification does not include any authorization for the intellectual property owned by our company or any third party. With respect to the information contained in this product specification, we make no explicit or implied warranties, including but not limited to the accuracy of the specification, its fitness for commercial use, suitability for specific purposes, or non-infringement of our company's or any third party's intellectual property. We also do not assume any responsibility for any incidental or consequential losses related to this specification document and its use.

We do not assume any obligations regarding application assistance or customer product design. Customers are responsible for their own use of our company's products and applications. In order to minimize risks associated with customer products and applications, customers should provide thorough design and operational safety validation.

The reproduction, transmission or use of this document or its contents is not permitted without express written authority. Once discovered, the company will pursue its legal responsibility according to law and compensate for all losses caused to the company.

Please note that the product is used within the conditions described in this document, paying particular attention to the absolute maximum rating, operating voltage range, and electrical characteristics. The Company shall not be liable for any damage caused by malfunctions, accidents, etc. caused by the use of the product outside the conditions stated in this document.

Division I has been committed to improving the quality and reliability of products, but all semiconductor products have a certain probability of failure, which may lead to some personal accidents, fire accidents, etc. When designing products, pay full attention to redundancy design and adopt safety indicators, so as to avoid accidents.

When using our chips to produce products, Division I shall not be liable for any patent dispute arising from the use of the chip in the product, the specification of the product, or the country of import, etc., in the event of a patent dispute over the products including the chip.