Ordering number : EN3246A

SANYO Semiconductors
DATA SHEET

LA5315M — Monolithic Linear IC For LCD Use Variable Divided Voltage Generator

Overview

The LA5315M is a variable divided voltage generator IC for multiple drive of LCD matrix.

Features

- Power supply for variable bias LCD drive (1/5 to 1/13 bias available by internal resistances).
- 5 voltage outputs.
- Low current drain (1.5mA max).
- Miniflat package.

Specifications

Absolute Maximum Ratings at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Maximum supply voltage	V_{CC} max	GND-V_{CC}	-35 to 0	V
Maximum output current	I_{OUT} max	V1, V2, V3, V4, V5	15	mA
Allowable power dissipation	Pd max		370	mW
Operating temperature	Topr		-20 to +75	°C
Storage temperature	Tstg		-30 to +125	°C

SANYO Semiconductor Co., Ltd.
TOKYO OFFICE Tokyo Bldg., 1-10, 1 Chome, Ueno, Taito-ku, TOKYO, 110-8534 JAPAN

51408 MS PC/31500TN (KT)/9279TA TS No.3246-1/6

Operating Conditions at Ta = 25°C

Parameter	Symbol	Conditions	Ratings	Unit
Recommended supply voltage	V_{CC}	GND-V_{CC} : (When V1 > -1V, I_{IN} is needed.)*	-30 to -10	V
Recommended input voltage	V_{REF}	GND-V_{REF} : $V_{REF} \geq V_{CC}$*	-30 to -6	V
Recommended input current	I_{IN}	V_{IN} : V1 > -1V, current source of I_{IN} : 1V or greater relative to GND	0.2 to 3	mA
Recommended output current	$I_{OUT}1$	V1	-0.1 to +5	mA
	$I_{OUT}2$, 3	V2, V3	-5 to +5	mA
	$I_{OUT}4$, 5	V4, V5	-10 to +0.1	mA

note * Set V_{CC}, V_{REF} so that $|V2|$, $|V_{CC}\text{-}V5|$ become 1V or greater.

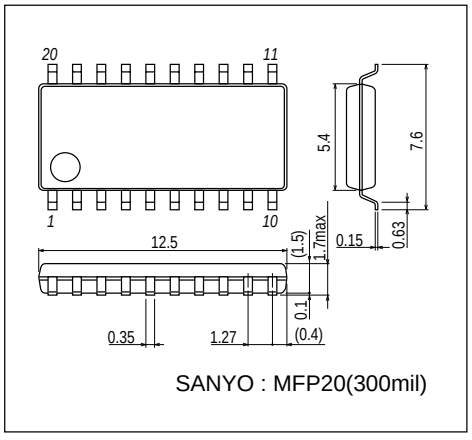
Electrical Characteristics at Ta = 25°C, V_{CC} = -16V

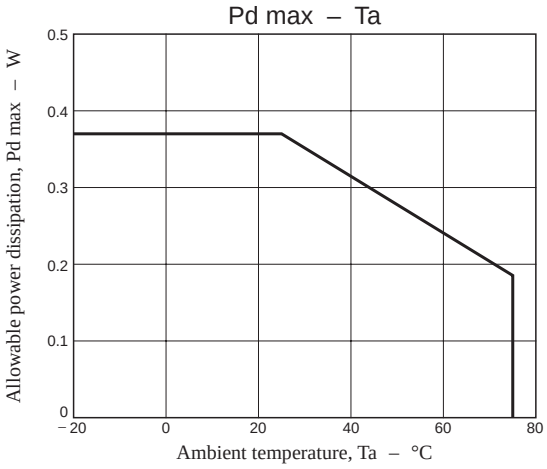
Parameter	Symbol	Conditions		Ratings min	Ratings typ	Ratings max	Unit
Current drain	I_{CC}	V_{IN}, GND-V_{CC}, V_{REF} : V_{CC} = V_{REF} = -16V, V_{IN} = GND, R_X = 5R				1.5	mA
Output voltage ratio 1	Ra1	V2/V1		1.96	2.00	2.04	
Output voltage ratio 2	Ra2	(V5-V3)/(V5-V4)	Vref = -12V, V_{CC} = -16V, 1/9 bias (R_X = 5R)	1.96	2.00	2.04	
Output voltage ratio 3	Rb1	V5/V1		8.73	9.00	9.27	
Output voltage ratio 4	Rb2	V5/V2		4.37	4.50	4.63	
Output voltage ratio 5	Rb3	V5/(V5-V3)		4.37	4.50	4.63	
Output voltage ratio 6	Rb4	V5/(V5-V4)		8.73	9.00	9.27	
Internal resistance ratio 1	4R	$V_{IN}3$-R_X1	Resistance ratio referenced to R across pins 5 and 6		4		
Internal resistance ratio 2	5R	$V_{IN}3$-R_X2			5		
Internal resistance ratio 3	6R	$V_{IN}3$-R_X3			6		
Internal resistance ratio 4	7R	$V_{IN}3$-R_X4			7		
Internal resistance ratio 5	8R	$V_{IN}3$-R_X5			8		
Internal resistance ratio 6	9R	$V_{IN}3$-R_X6			9		
Resistance	R	RX1-RX2 : R value when 0.5V is applied across pins 5 and 6			20		kΩ
Load regulation 1	ΔV1	V1 : +100μA < $I_{OUT}1$ < +5mA				20	mV
Load regulation 2	ΔV2	V2 : +100μA < $I_{OUT}2$ < +5mA				20	mV
Load regulation 3	ΔV3	V3 : +100μA < $I_{OUT}3$ < +5mA				20	mV
Load regulation 4	-ΔV2	V2 : -5mA < $I_{OUT}2$ < -100μA				20	mV
Load regulation 5	-ΔV3	V3 : -5mA < $I_{OUT}3$ < -100μA				20	mV
Load regulation 6	-ΔV4	V4 : -10mA < $I_{OUT}4$ < -100μA				20	mV
Load regulation 7	-ΔV5	V5 : -10mA < $I_{OUT}5$ < -100μA				20	mV

Package Dimensions

unit : mm (typ)

3036C



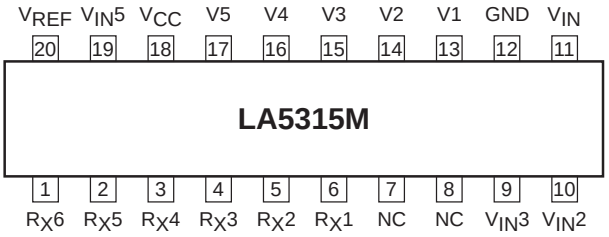


Pin Functions

Pin No.	Pin Name	Description	Remarks
1	R_X6	R_X pin	Pin 10 shorted R_X = 9R
2	R_X5	R_X pin	Pin 10 shorted R_X = 8R
3	R_X4	R_X pin	Pin 10 shorted R_X = 7R
4	R_X3	R_X pin	Pin 10 shorted R_X = 6R
5	R_X2	R_X pin	Pin 10 shorted R_X = 5R
6	R_X1	R_X pin	Pin 10 shorted R_X = 4R
7		NC	
8		NC	
9	$V_{IN}3$	V3 input	
10	$V_{IN}2$	V2 input	
11	V_{IN}	V1 supply (+ supply)	When V1 > -1.0V, V_{IN} is applied. When V1 < -1.0V, this pin is shorted to GND.
12	GND	GND	
13	V1	V1 output	
14	V2	V2 output	
15	V3	V3 output	
16	V4	V4 output	
17	V5	V5 output	
18	V_{CC}	V_{CC} supply (- supply)	
19	$V_{IN}5$	V5 input	
20	V_{REF}	V_{REF} supply (- supply)	

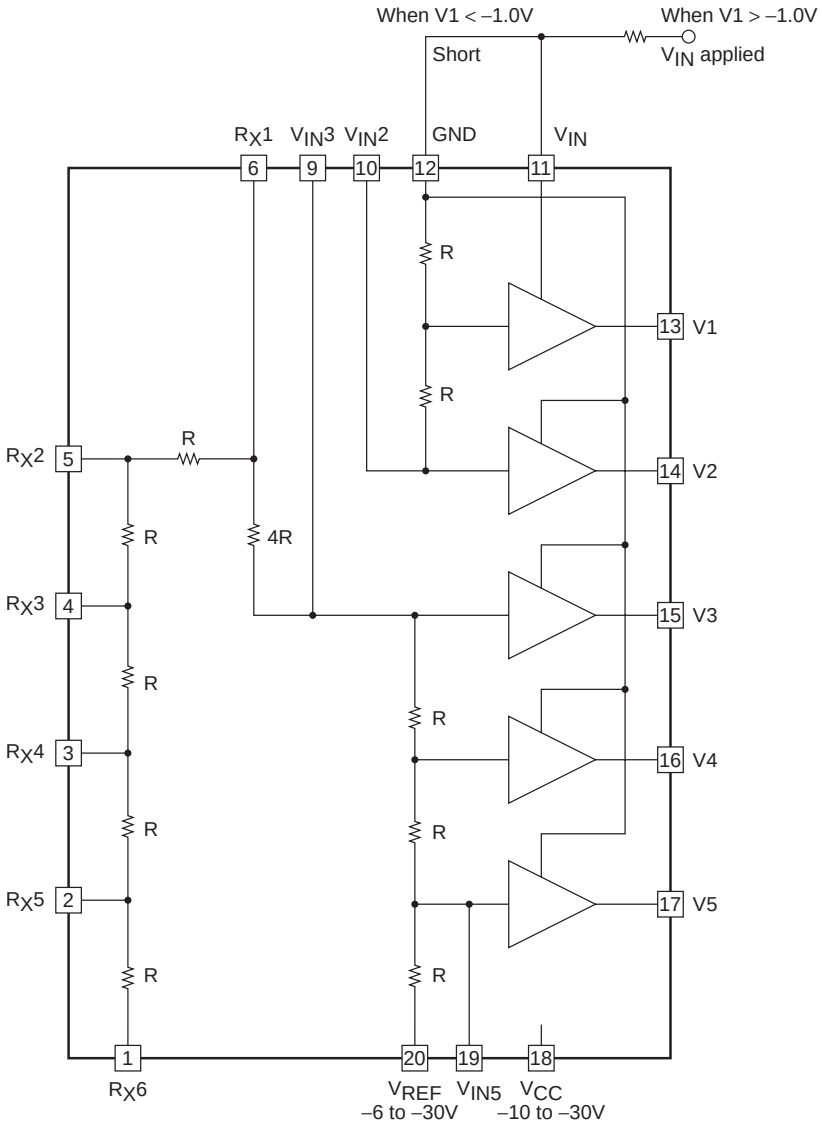
Note) Do not use the NC pin.

Pin Assingment

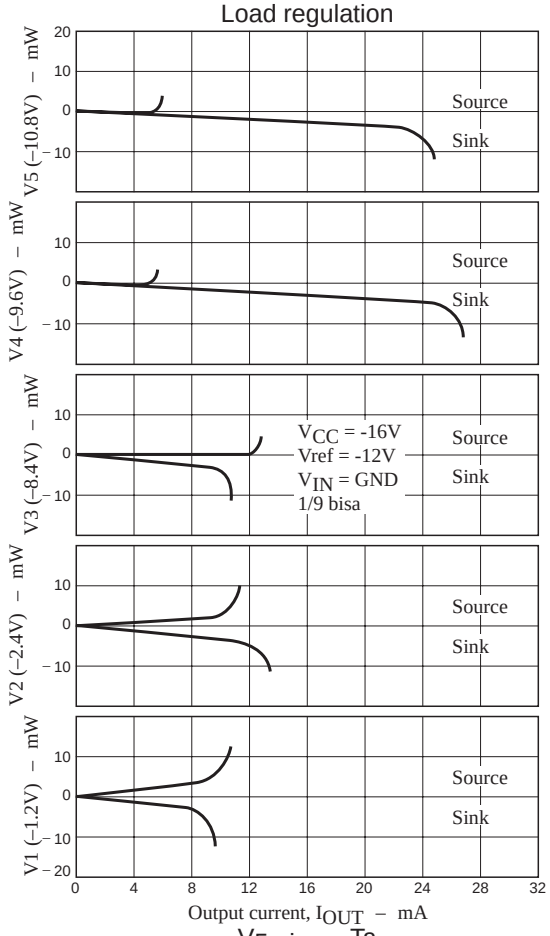


Top view

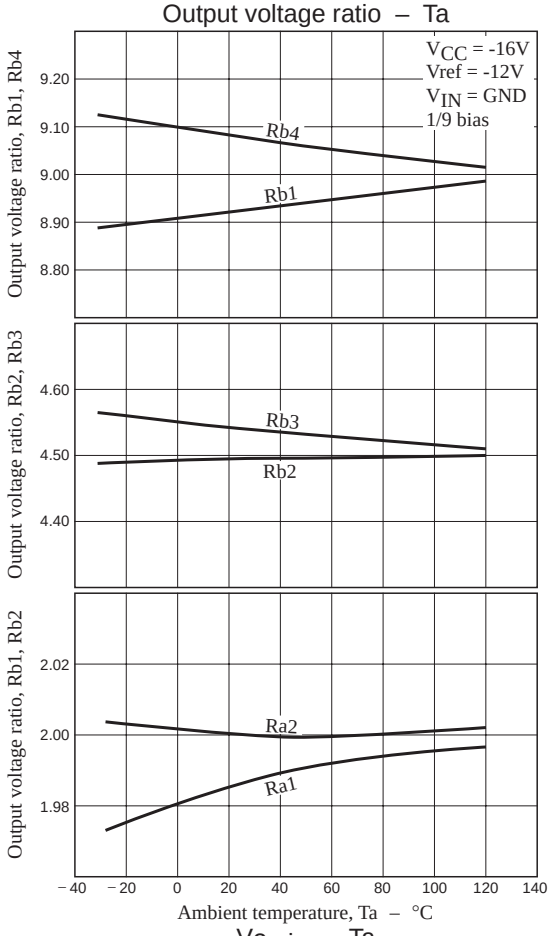
Block Diagram



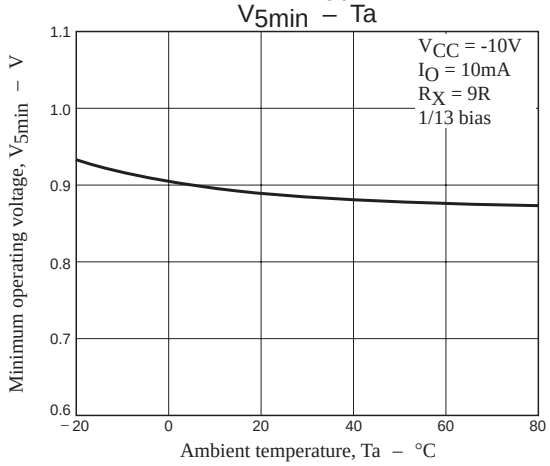
Load regulation



Output voltage ratio – Ta



V5min – Ta



V2min – Ta