



# AnaSem Analog Semiconductor IC

## VRD(Dual) Series

### High Speed/Low Dropout/High Accuracy Dual CMOS Positive Voltage Regulator

#### Description

The VRD Series is a dual positive voltage regulator where high speed low dropout and highly accurate output were achieved by low current consumption. Because each regulator is completely separated, the crosstalk between each regulator can be reduced. The output voltage guarantees  $\pm 1\%$  within the range of all temperatures by  $V_{ref}$  that the temperature characteristic is controlled. It corresponds to the low ESR capacitor as an output stabilization capacitor. The charged ESR capacitor can be discharged with an internal switch by making the  $CE=V_{ss}$ , as a result the  $V_{out}$  quickly returns to the  $V_{ss}$  level. To make the current capacity of the output transistor not exceeded, the overcurrent protection circuit is built in.

#### Feature

- Output voltage: 0.8~5.0V (Selectable 50mV Step)
- Operating voltage range: 1.6V~6.0V
- High accuracy output voltage:  $\pm 1\%$  (-40~85°C)
- Maximum output current: 250mA
- Dropout voltage: 90mV (Output: 3.0V  $I_{out}$ : 100mA)
- Low current consumption: Typ/25  $\mu$ A/Ch
- Stand-by current: Max 0.1  $\mu$ A
- High ripple rejectin: Typ/75dB at 1KHz
- Low ESR capacitor : 1.0  $\mu$ F ceramic capacitor
- Output capacitor can be rapidly discharged at  $EN=V_{ss}$
- Operating temperature range: -40 to 85°C
- Built-in overcurrent protector
- Small package: SOT-26(400mW) LLP-6(600mW)

#### Product Number:

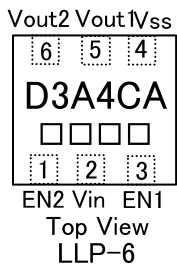
VRD3A4CNLA, VRD3A4CNTA

#### Applications

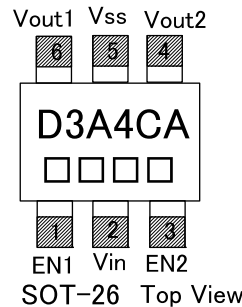
- Battery powered-devices
- Cellular phones
- Digital/Video cameras
- Portable games
- Handheld instruments

VRD	3C4B: Output Voltage Spec	N: Function Spec	T/L: Package	A: Version															
AnaSem V/R D-Series	3A: 3.05V/V <sub>out1</sub> 4C: 4.25V/V <sub>out2</sub>	N: Input/1.6~6.0V Output/+0.8~5.0V	T: SOT-26 L: LLP-6	A: $\pm 1\%$ B: $\pm 20mV/-40\sim+85^\circ C$															
0	A	1	B	2	C	3	D	4	E	5	F	6	G	7	H	8	J	9	K
.00	.05	.10	.15	.20	.25	.30	.35	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90	.95

#### Pin Configuration

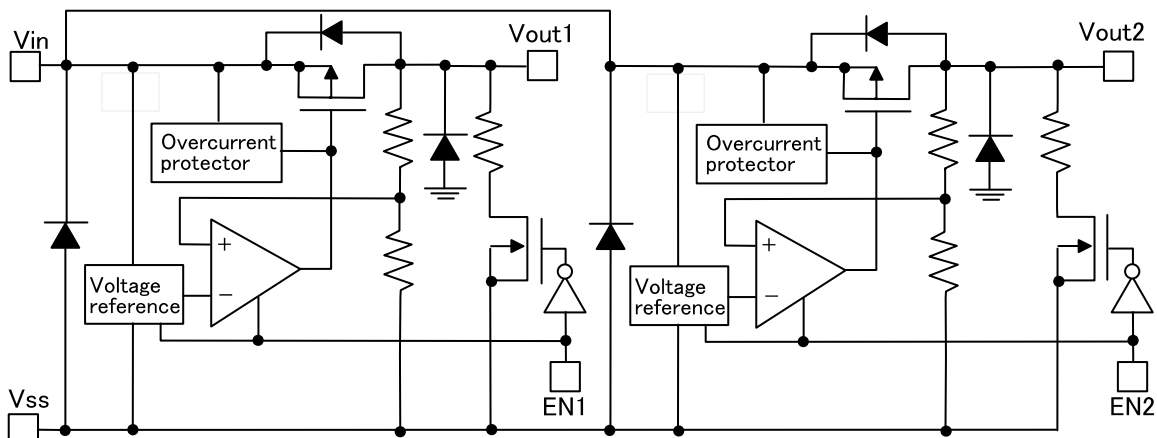


Pin	Name	Description
1	EN2	2 Ch Enable
2	Vin	Input Voltage
3	EN1	1 Ch Enable
4	Vss	Power Ground
5	Vout1	1 Ch Output
6	Vout2	2 Ch Output

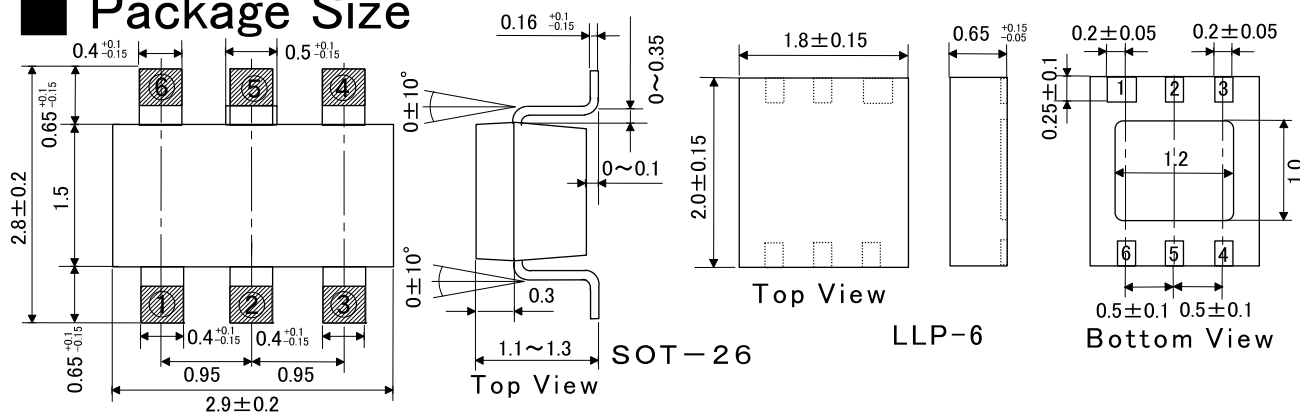


Pin	Name	Description
1	EN1	1 Ch Enable
2	Vin	Input Voltage
3	EN2	2 Ch Enable
4	Vout2	2 Ch Output
5	Vss	Power Ground
6	Vout1	1 Ch Output

#### Block Diagram



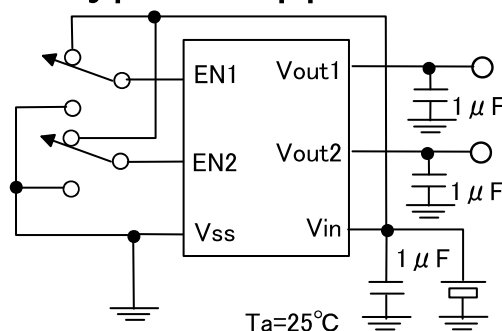
## Package Size



## Absolute Maximum Rating

Item	Sign	Value	
Input Supply Voltage	Vin	-0.3V~+7.0V	
Output Current	Iout	500mA	
Output Voltage	Vout	Vss-0.3V~Vin+0.3V	
Power Dissipation	SOT-26	Pd	400mW (ON PCB)
	LLP-6	Pd	600mW (ON PCB)
Operating Temperature Range	Topr	-40~+85°C	
Storage Temperature Range	Tstg	-50~+125°C	

## Typical Application



## Electric Characteristics

Item	Symbol	Measurement condition	Spec			Unit
			Min	Typ	Max	
Output voltage	Vout	Vout+1.0V ≤ Vin ≤ 6.0V Iout=30mA -40°C ≤ Ta ≤ +85°C	Vout ≥ 1.95V	Vout	Vout	V
			Vout ≤ 1.9V	-20	+20	mV
Output current	Iout	Vin ≥ Vout+1.0V	0.8V ≤ Vout ≤ 1.15V	250		mA
			1.2V ≤ Vout ≤ 1.65V	250		mA
			1.7V ≤ Vout ≤ 2.25V	250		mA
			2.3V ≤ Vout ≤ 2.85V	250		mA
			2.9V ≤ Vout ≤ 3.45V	250		mA
			3.5V ≤ Vout ≤ 4.05V	250		mA
			4.0V ≤ Vout ≤ 5.0V	250		mA
Dropout voltage	Vdrop1 Vdrop2	Iout=100mA	0.8V ≤ Vout ≤ 1.15V	580	910	mV
			1.2V ≤ Vout ≤ 1.65V	210	340	mV
			1.7V ≤ Vout ≤ 2.25V	130	205	mV
			2.3V ≤ Vout ≤ 2.85V	100	150	mV
			2.9V ≤ Vout ≤ 3.45V	90	137	mV
			3.5V ≤ Vout ≤ 4.05V	85	125	mV
			4.0V ≤ Vout ≤ 5.0V	80	115	mV
Power dissipation	Idd	Vin=Vout+1.0V, Vout=Open, Iout=0mA		50	80	µA
Standby current	Istb	EN=Vss		0.01	0.1	µA
Input voltage	Vin		1.6		6.0	V
Load regulation	ΔVout1,2	Vin=Vout+1.0V, 1mA ≤ Iout ≤ 100mA		10	40	mV
Line regulation	$\frac{\Delta V_{out}}{\Delta V_{in} - V_{out}}$	Vout+1.0V ≤ Vin ≤ 6.0V, Iout=30mA		0.01	0.10	%/V
Ripple rejection	Rr	Vin=Vout+1.0V, f=1.0KHz, ΔVrip=0.5Vp-p, Iout=30mA		75		dB
Output voltage temperature coefficient	$\frac{\Delta V_{out}}{\Delta T_a - V_{out}}$	Vin=Vout+1.0V, Iout=30mA -40 ≤ Ta ≤ +85°C		±20		ppm/°C
Limit current	Ilimit	EN=Vin	300			mA
Short circuit current	Ishort	Vin=Vout+1.0V, Vout=0V		40		mA

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