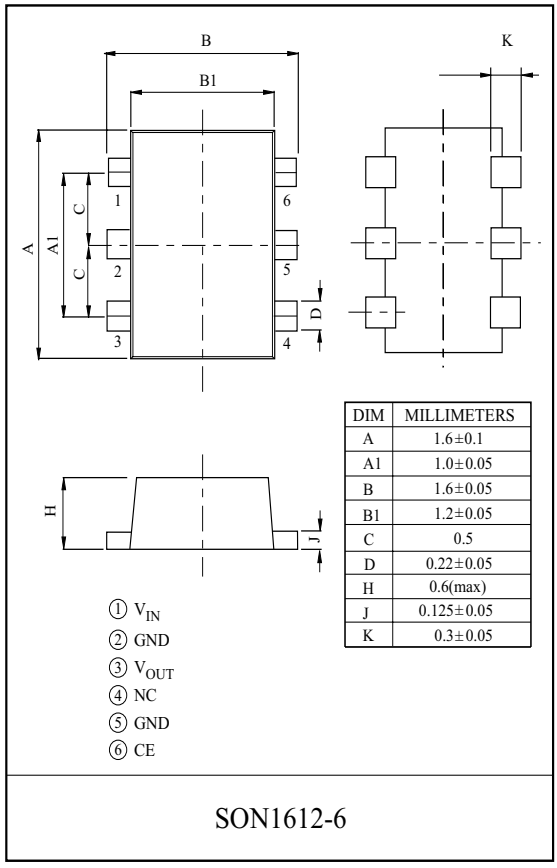
LOW Noise150mA CMOS High Performance LDO Regulator

The KIC3211Series Low Dropout Linear Regulator is ideally suited for portable applications. It offers 1% initial accuracy, extremely-low dropout voltage(220mV at 150mA, 3.0V Output Type) and low ground current (typically 75uA). Designed specifically for handheld and battery-powered devices, the KIC3211series provides a TTL-logic-compatible ON/OFF control pin. When disabled, power consumption drops nearly to zero.
The KIC3211Series also works with low-ESR ceramic capacitors, reducing the amount of board space necessary for power applications, critical in handheld wireless devices.
The Line transient response and load transient response of the KIC3211Series are very excellent, thus ICs are very suitable for the power supply for hand-held communication equipment.



DIM	MILLIMETERS
A	1.6±0.1
A1	1.0±0.05
B	1.6±0.05
B1	1.2±0.05
C	0.5
D	0.22±0.05
H	0.6(max)
J	0.125±0.05
K	0.3±0.05

SON1612-6

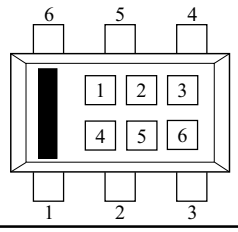
Applications

- Cellular phones,Smart Phones, PDA
- Battery-powered equipment
- Laptop, notebook and palmtop computers
- Consumer/personal electronics

Features

- Input voltage range ----------1.7V to 6.0V
- High output accuracy----------1.0% accuracy
- Low dropout----------220mV@150mA 3.0V, Output type
- Stability with ceramic output capacitors
- High Ripple Rejection----------Typ. 70dB(f=1kHz3.0V Output type)
  Typ. 60dB(f=10kHz3.0V Output type)
- Low ground Current----------Typ.75 μA
- Quiescent Current----------Typ. 0.1 μA
- Excellent Line regulation----------Typ. 0.02%/V
- Built-in Fold Back Protection Circuit-------Typ. 50mA@Short mode
- Stability with ceramic output capacitors-----Cin=Cout=1.0μF
- TTL-Logic-compatible ON/OFF control input

Mark Spec.

Out line	No.	No. of Mark	Marking	Description
	1~2	Series Voltage	X X	Output Voltage (ex, 33A → V_{OUT}=3.3V)
	3	Device Definition	A	
	4~6	Lot. No.	X X X	Manufacture Year, Week (ex, 924 → 2009 year →24th week)

SECLECTION GUIDE

The output voltage, package type for the ICs can be selected at the user's request.

The selection can be made with designating the part number as shown below;

KIC3211XXXXA ← Part Number

a b

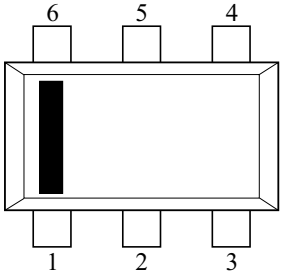
Code	Contents
a	Dessignation of Package Type: **SN : SON1612-6**
b	Setting Output Voltage (VOUT) : Stepwise setting with a step of 0.1V in the range of 1.2V to 4.0V is possible.

Line up

Item	Output Voltage	Marking	Package	Item	Output Voltage	Marking	Package
KIC3211SN12A	1.2V	12A		KIC3211SN27A	2.7V	27A	
KIC3211SN13A	1.3V	13A		KIC3211SN28A	2.8V	28A	
KIC3211SN14A	1.4V	14A		KIC3211SN29A	2.9V	29A	
KIC3211SN15A	1.5V	15A		KIC3211SN30A	3.0V	30A	
KIC3211SN16A	1.6V	16A		KIC3211SN31A	3.1V	31A	
KIC3211SN17A	1.7V	17A		KIC3211SN32A	3.2V	32A	
KIC3211SN18A	1.8V	18A		KIC3211SN33A	3.3V	33A	
KIC3211SN19A	1.9V	19A	SON1612-6	KIC3211SN34A	3.4V	34A	SON1612-6
KIC3211SN20A	2.0V	20A		KIC3211SN35A	3.5V	35A	
KIC3211SN21A	2.1V	21A		KIC3211SN36A	3.6V	36A	
KIC3211SN22A	2.2V	22A		KIC3211SN37A	3.7V	37A	
KIC3211SN23A	2.3V	23A		KIC3211SN38A	3.8V	38A	
KIC3211SN24A	2.4V	24A		KIC3211SN39A	3.9V	39A	
KIC3211SN25A	2.5V	25A		KIC3211SN40A	4.0V	40A	
KIC3211SN26A	2.6V	26A					

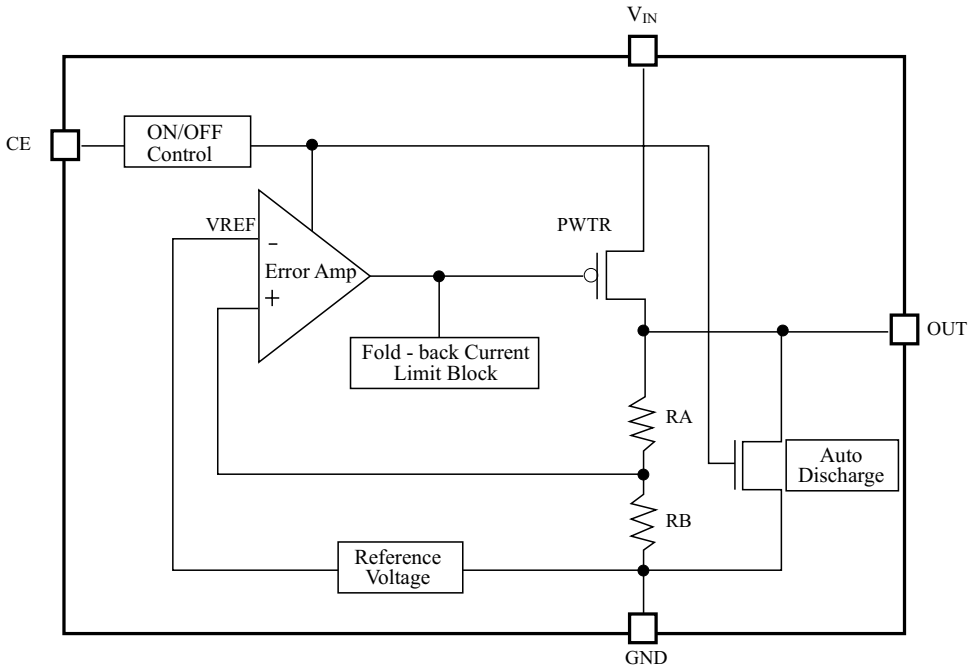
PIN DESCRIPTIONS

SON1612-6 PKG

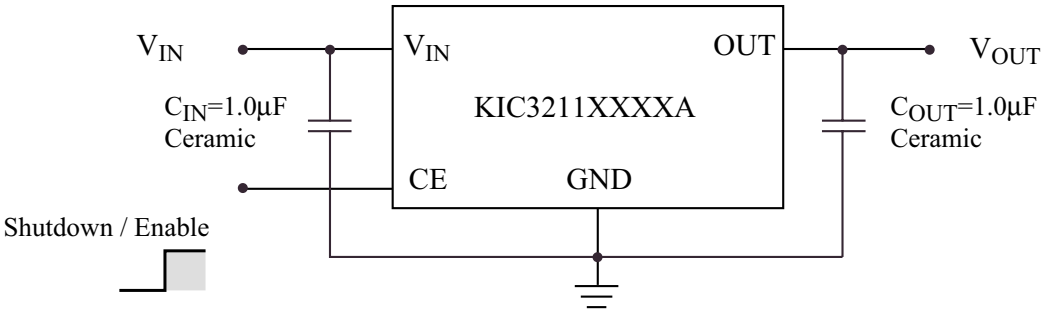


Pin No.	Pin name	Pin Description
1	V_{DD}	Input Pin
2	GND	Ground Pin
3	V_{OUT}	Regulator Output
4	NC	No connectin
5	GND	Ground Pin
6	CE	Enable/Shutdown (Input) : CMOS compatible input. Logic high=enable, logic low=shutdown. Do not leave open.

Block Diagram



Application Circuit



Stability with ceramic output capacitors Cin = Cout = 1.0μF (X7R, X5R)

Absolute Maximum Ratings

Characteristics	Symbol	Rating	Units
Input Voltage	V_{IN}	6.0	V
Output Current	I_{OUT}	300	mA
Output Voltage	V_{OUT}	1.2 to 4.0	V
Power Dissipation (Note)	P_D	500	mW
Operating Temperature	T_{OPR}	-40 to +85	℃
Storage Temperature	T_{STG}	-65 to +125	℃

Note) Package Mounted on FR-4 PCB board (40㎜×40㎜×1.6㎜)

Electrical Characteristics

($V_{EN} = V_{IN}$, $T_a = 25°C$)

Symbol	Parameter	Conditions		Min	Typ	Max	Units
V_{IN}	Input Voltage			1.7	-	6.0	V
V_{OUT}	Output Voltage	V_{IN} = Set V_{OUT} + 1V 1mA ≤ I_{OUT} ≤ 30mA		x 0.990	-	x 1.010	V
I_{OUT}	Output Current	V_{IN} - V_{OUT} = 1.0V		150	-	-	mA
V_D	Dropout Voltage (Note 1)	V_{OUT} = 1.2~1.5	I_{OUT} = 150mA	-	0.38	0.70	V
		V_{OUT} = 1.6~1.7		-	0.36	0.65	V
		1.8 ≦ V_{OUT} ≦ 2.0		-	0.32	0.55	V
		2.1 ≦ V_{OUT} ≦ 2.7		-	0.28	0.50	V
		2.8 ≦ V_{OUT} ≦ 4.0		-	0.22	0.35	V
I_{GND}	Ground Pin Current (Note 2)	I_{OUT} = 0mA		-	75	95	μA
		I_{OUT} = 150mA		-	100	150	μA
I_Q	Quiescent Current	V_{IN} = Set V_{OUT} + 1V V_{EN} = GND (shutdown)		-	0.1	1	μA
$\Delta V_{OUT} / \Delta V_{IN}$	Line Regulation	I_{OUT} = 1mA Set V_{OUT} + 0.5V ≤ V_{IN} ≤ 6.0V		-	0.02	0.10	% / V
$\Delta V_{OUT} / \Delta I_{OUT}$	Load Regulation	V_{IN} = Set V_{OUT} + 1V 1mA ≤ I_{OUT} ≤ 150mA		-	22	40	mV
RR	Ripple Rejection	f = 1kHz	Ripple 0.5V p-p V_{IN} - V_{OUT} = 1.0V	-	70	-	dB
		f = 10kHz		-	60	-	dB
$\Delta V_{OUT} / \Delta T$	Output Voltage Temperature Coefficient	I_{OUT} = 30mA -40°C ≤ T_{OPR} ≤ 85°C		-	±100	-	ppm / °C
I_{LIM}	Short Current Limit	V_{OUT} = 0V		-	50	-	mA
V_{NO}	Output Noise Voltage	C_{IN} = 1.0μF, C_{OUT} = 1.0μF BW = 10Hz ~ 100kHz		-	30	-	μVrms
$V_{EN\ (ON)}$	Output Control Voltage (ON - State)	-		1.6	-	-	V
$V_{EN\ (OFF)}$	Output Control Voltage (OFF - State)	-		-	-	0.4	V

Note 1) Dropout Voltage is defined as the input-to-output differential at which the output voltage drops 2% below its nominal value measured at 1V differential. For outputs below 2.5V, dropout voltage is the input-to-output voltage differential with the minimum input voltage 2.6V

Note 2) Ground pin current is the regulator quiescent current. The total current drawn from the supply is the sum of the load current plus the ground pin current.

TYPICAL CHARACTERISTICS

1) OUTPUT VOLTAGE vs OUTPUT CURRENT (T_{OPR} = 25℃)

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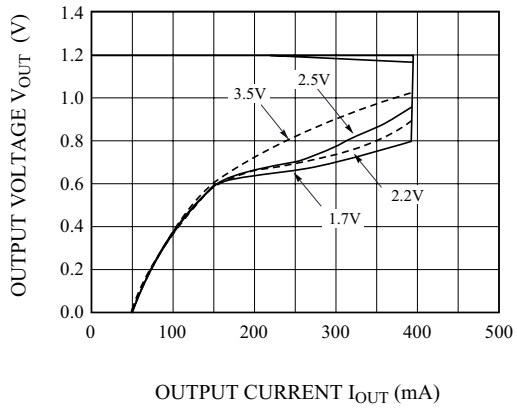

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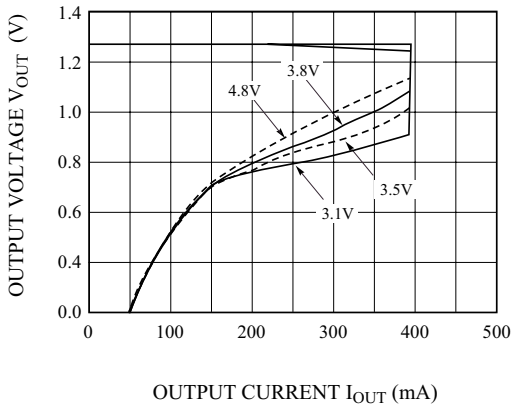

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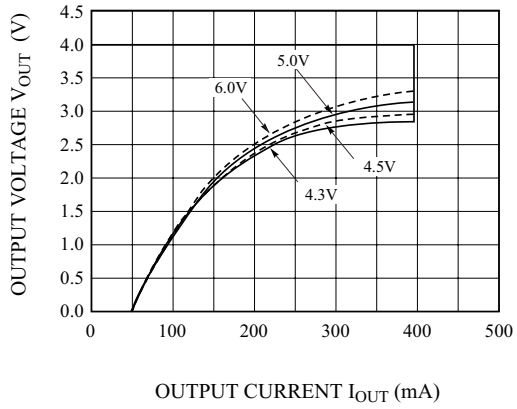

2) OUTPUT VOLTAGE vs INPUT VOLTAGE (T_{OPR} = 25℃)

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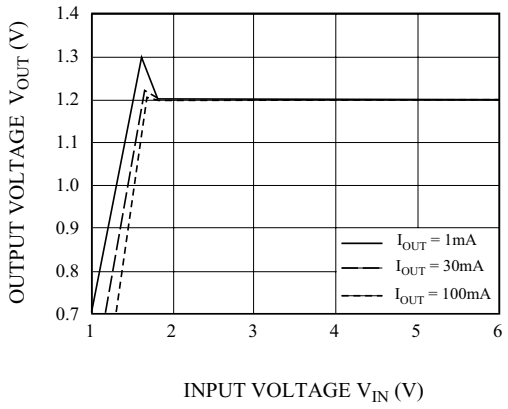

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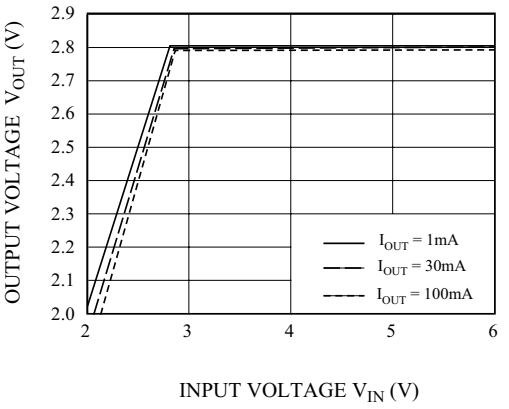

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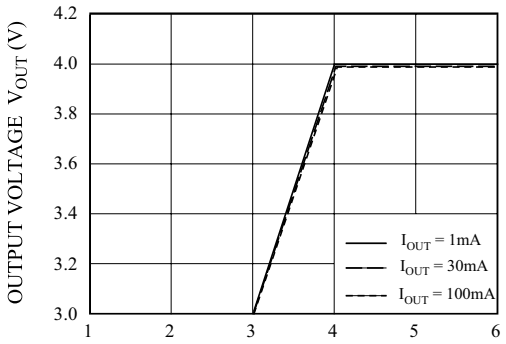

3) SUPPLY CURRENT vs INPUT VOLTAGE (T_{OPR} = 25℃)

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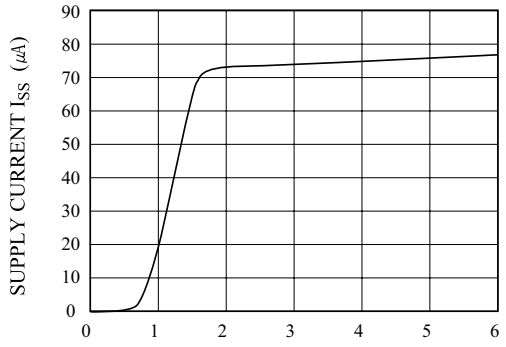

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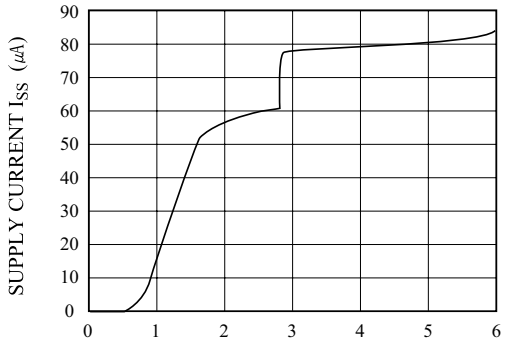

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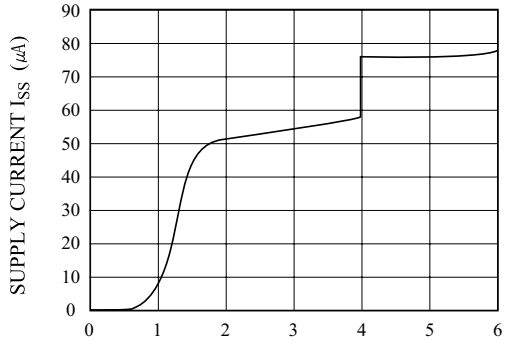

4) OUTPUT VOLTAGE vs TEMPERATURE

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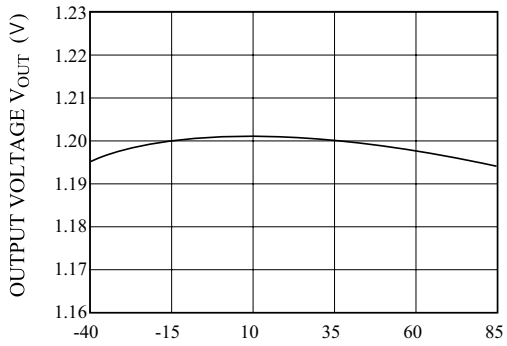

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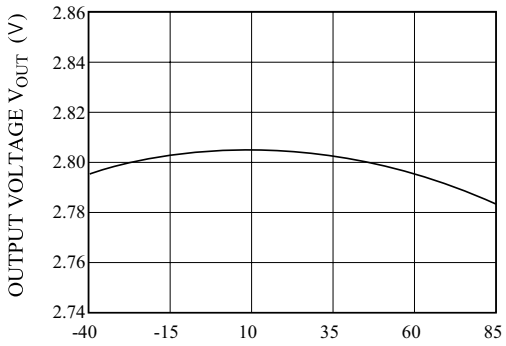

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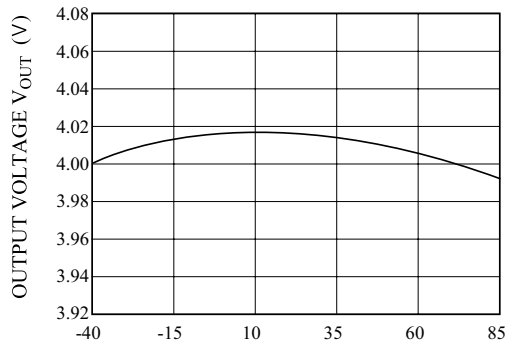

5) RIPPLE REJECTION vs FREQUENCY(C_{IN} = none)

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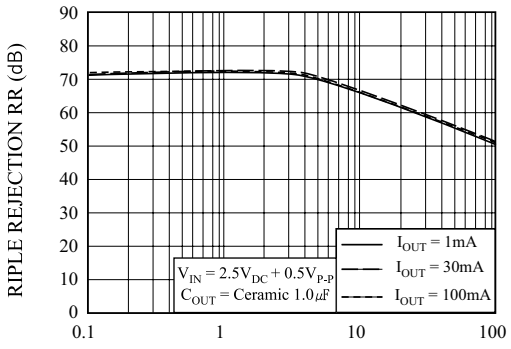

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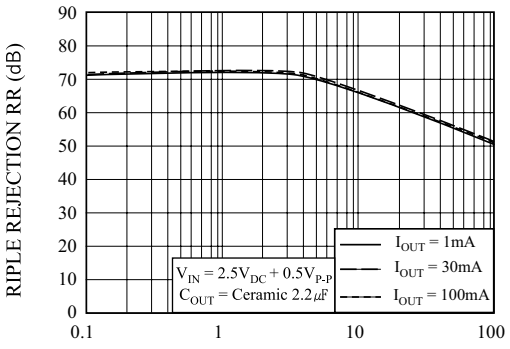

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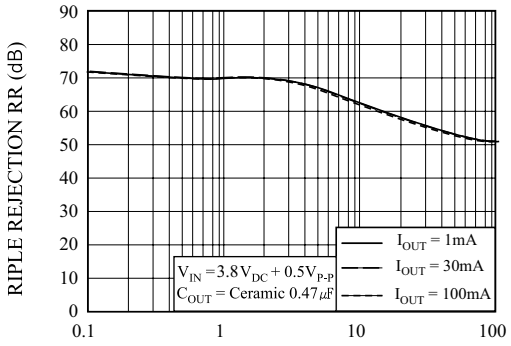

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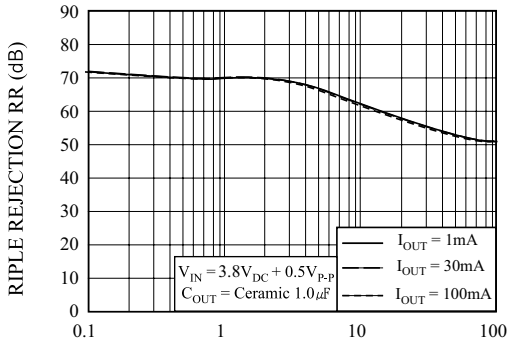

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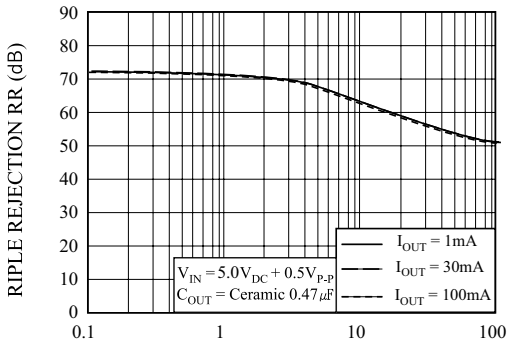

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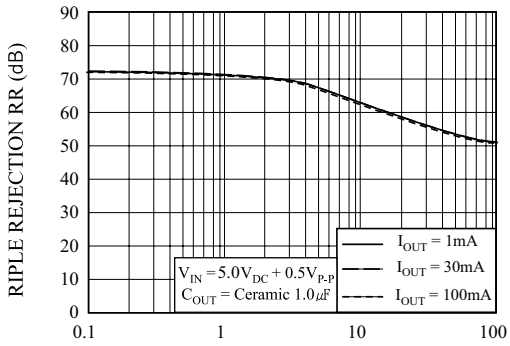

6) INPUT LINE TRANSIENT RESPONSE(I_{OUT} = 30mA, tr = tf = 5us, C_{IN} / C_{OUT} = Ceramic 1.0μF)

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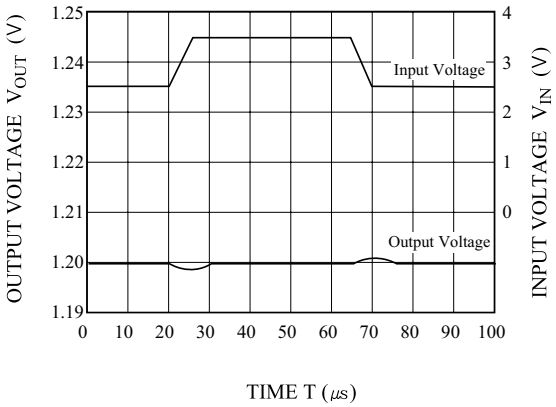

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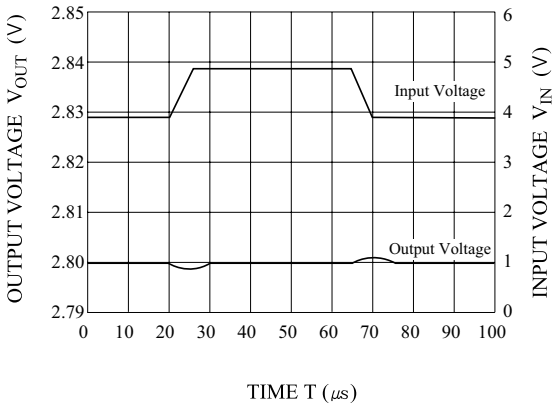

7) LOAD TRANSIENT RESPONSE (tr = tf = 5us, C_{IN} / C_{OUT} = Ceramic 1.0μF)

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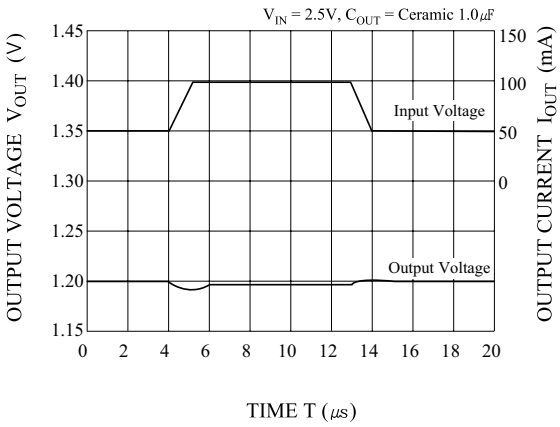

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