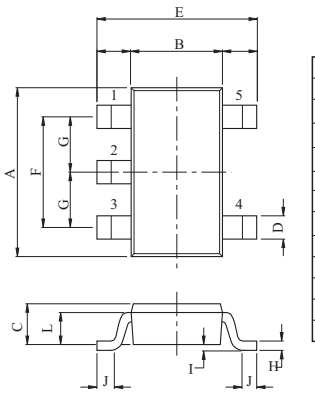
LOW Noise150mA CMOS High Performance LDO Regulator

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 KIC3211T/SN Series are very excellent, thus ICs are very suitable for the power supply for hand-held communication equipment.



DIM	MILLIMETERS
A	2.9±0.2
B	1.6+0.2/-0.1
C	0.70±0.05
D	0.4±0.1
E	2.8+0.2/-0.3
F	1.9±0.2
G	0.95
H	0.16±0.05
I	0.00-0.10
J	0.25+0.25/-0.15
K	0.60
L	0.55

① V_{IN}
② GND
③ ON/OFF Control
④ BYP
⑤ V_{OUT}

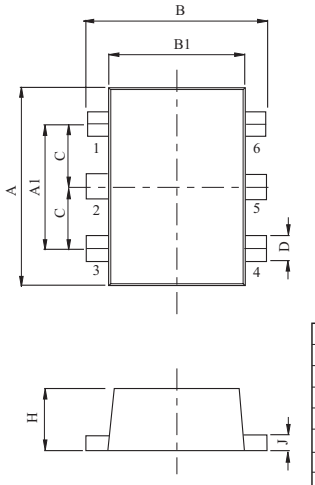
TSV

Applications

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

Features

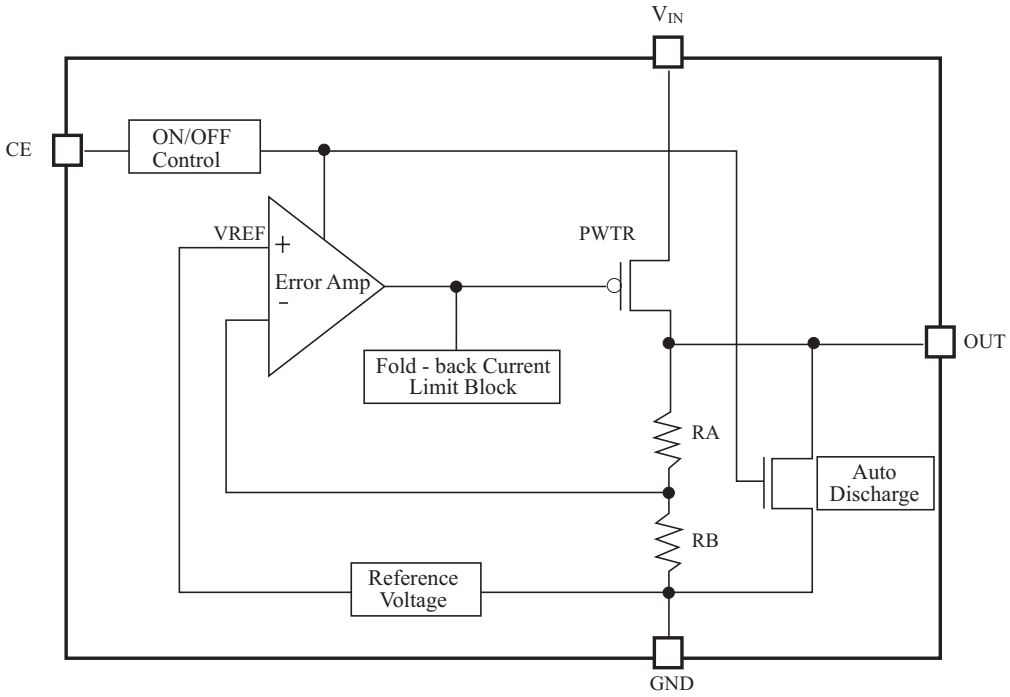
- Input voltage range ----------1.7V to 6.0V
- High output accuracy----------1.0% accuracy
- Low dropout----------220mV@150mA 3.0V, Output type
- Stability with ceramic output capacitors
- High Ripple Rejection----------Typ. 70dB(f=1kHz3.0V Output type)
  Typ. 60dB(f=10kHz3.0V Output type)
- Low ground 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



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

Block Diagram



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;

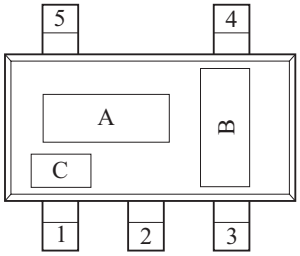
KIC3211XXXXA ← Part Number

a b

Code	Contents
a	Dessignation of Package Type: **T : TSV 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.

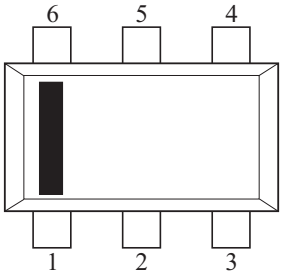
PIN DESCRIPTIONS

TSV PKG



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

SON1612-6 PKG



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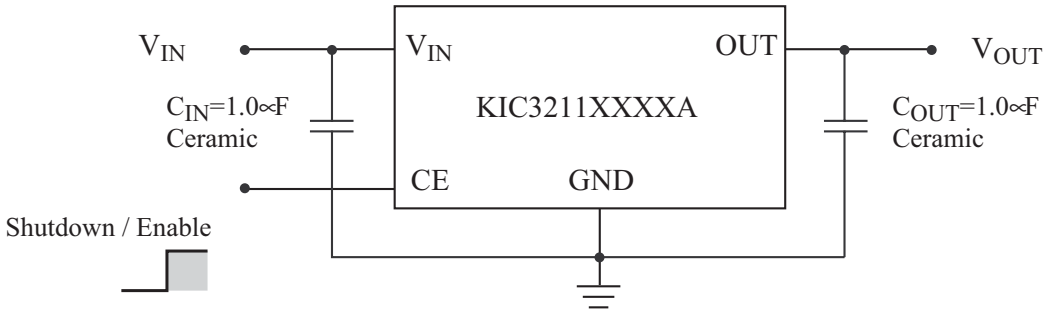
Application Circuit



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

Line up

Item	Output Voltage	Marking	Package	Item	Output Voltage	Marking	Package
KIC3211T/SN12A	1.2V	12A	TSV/ SON1612-6	KIC3211T/SN27A	2.7V	27A	TSV/ SON1612-6
KIC3211T/SN13A	1.3V	13A		KIC3211T/SN28A	2.8V	28A	
KIC3211T/SN14A	1.4V	14A		KIC3211T/SN29A	2.9V	29A	
KIC3211T/SN15A	1.5V	15A		KIC3211T/SN30A	3.0V	30A	
KIC3211T/SN16A	1.6V	16A		KIC3211T/SN31A	3.1V	31A	
KIC3211T/SN17A	1.7V	17A		KIC3211T/SN32A	3.2V	32A	
KIC3211T/SN18A	1.8V	18A		KIC3211T/SN33A	3.3V	33A	
KIC3211T/SN19A	1.9V	19A		KIC3211T/SN34A	3.4V	34A	
KIC3211T/SN20A	2.0V	20A		KIC3211T/SN35A	3.5V	35A	
KIC3211T/SN21A	2.1V	21A		KIC3211T/SN36A	3.6V	36A	
KIC3211T/SN22A	2.2V	22A		KIC3211T/SN37A	3.7V	37A	
KIC3211T/SN23A	2.3V	23A		KIC3211T/SN38A	3.8V	38A	
KIC3211T/SN24A	2.4V	24A		KIC3211T/SN39A	3.9V	39A	
KIC3211T/SN25A	2.5V	25A		KIC3211T/SN40A	4.0V	40A	
KIC3211T/SN26A	2.6V	26A					

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	TSV	900	mW
		SON1612-6	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

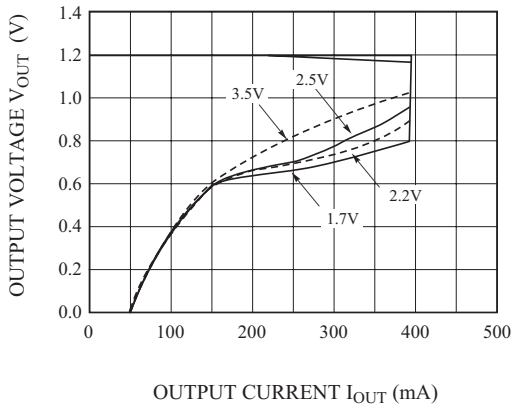
Note 1) Dropout Voltage is defined as the input-to-output differential at which the output voltage drops 2% below its nominal value measured at 1V differential. For outputs below 2.5V, dropout voltage is the input-to-output voltage differential with the minimum input voltage 2.6V

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°C)

KIC3211XX12



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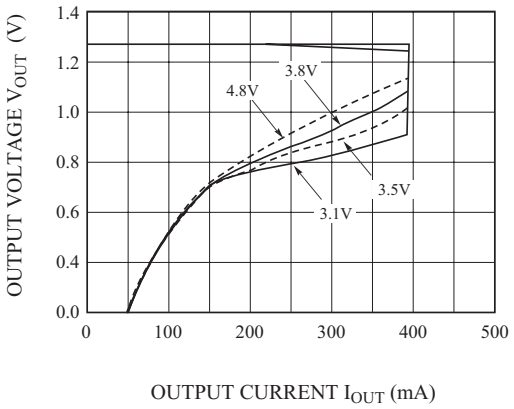

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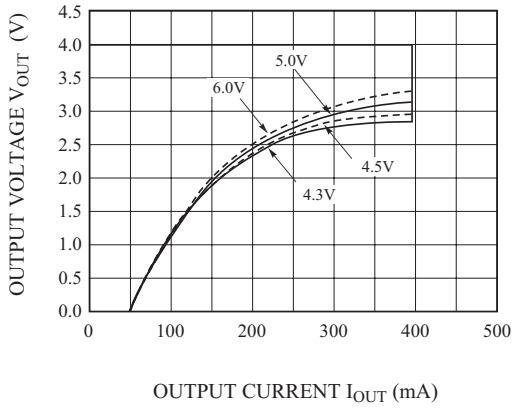

2) OUTPUT VOLTAGE vs INPUT VOLTAGE (T_{OPR} = 25°C)

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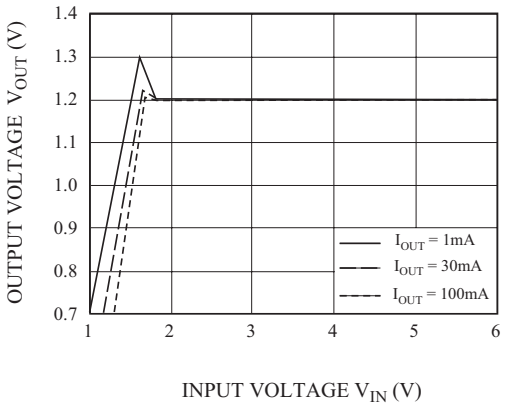

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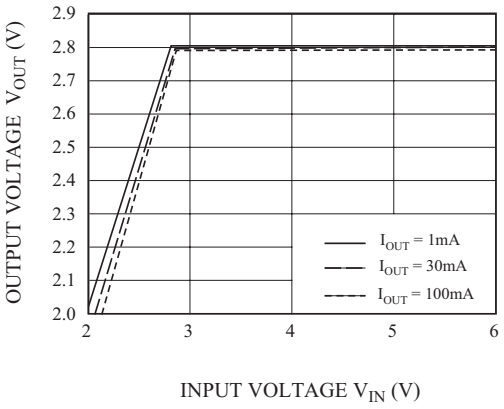

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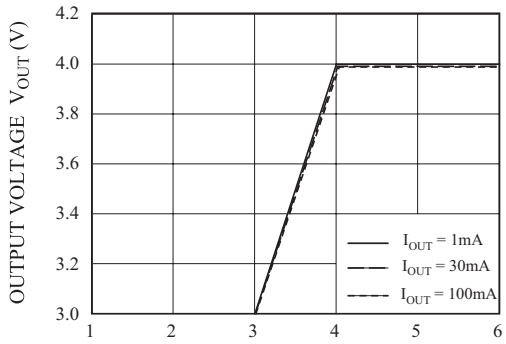

3) SUPPLY CURRENT vs INPUT VOLTAGE (T_{OPR} = 25°C)

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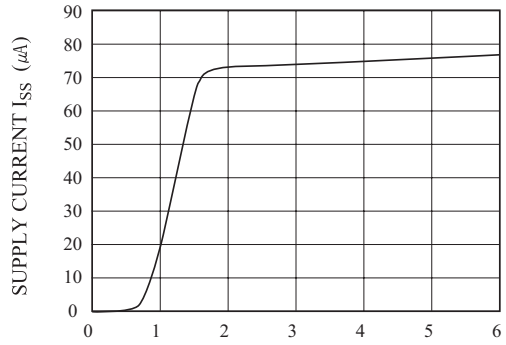

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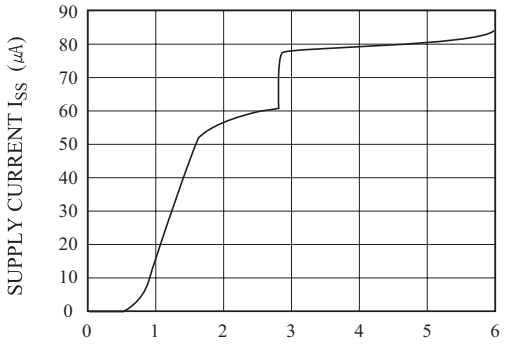

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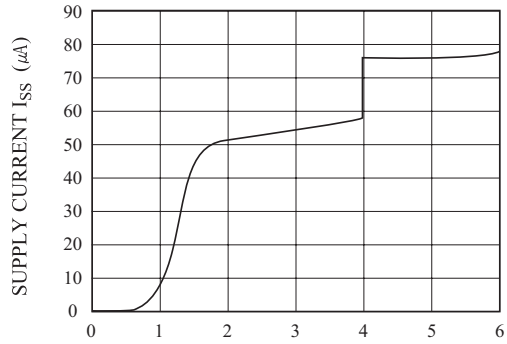

4) OUTPUT VOLTAGE vs TEMPERATURE

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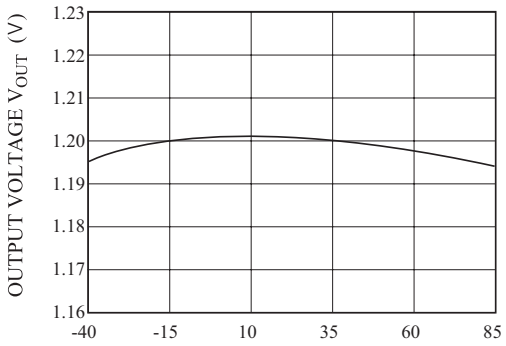

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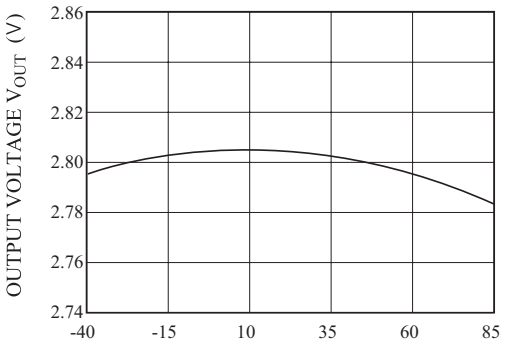

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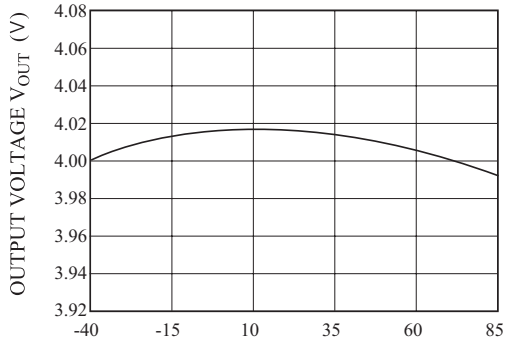

5) RIPPLE REJECTION vs FREQUENCY(C_{IN} = none)

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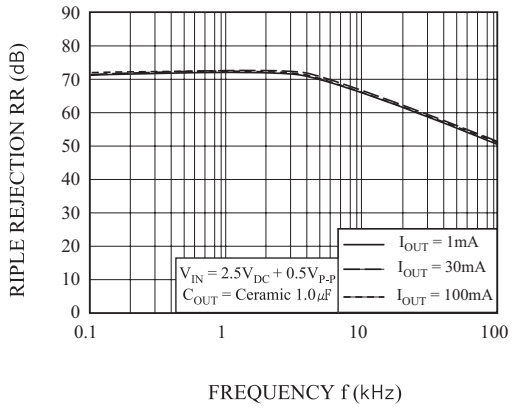

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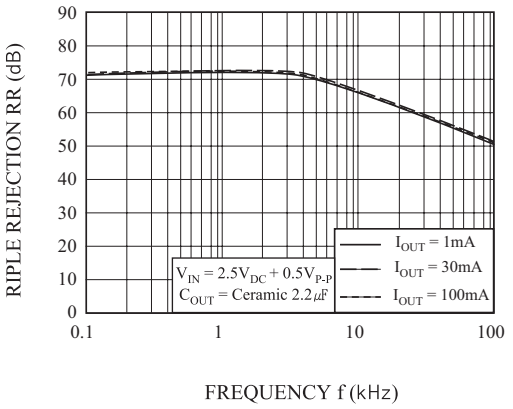

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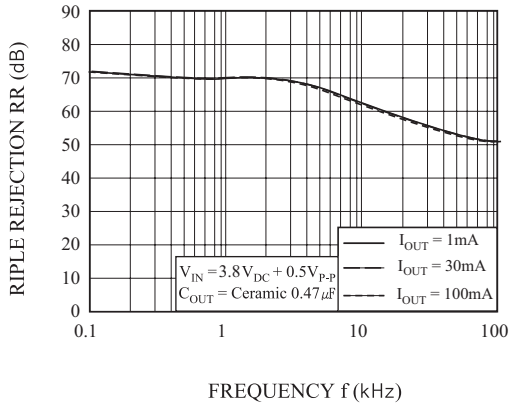

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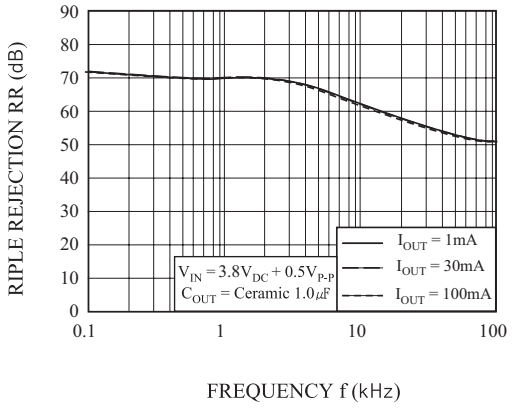

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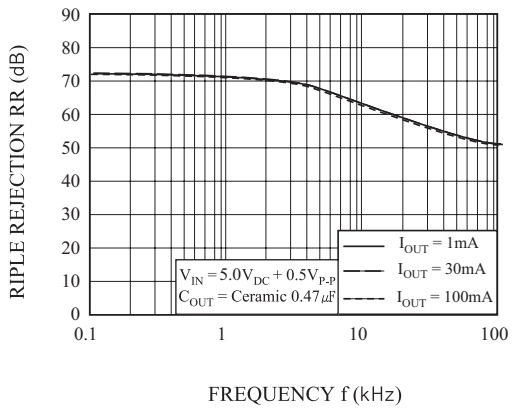

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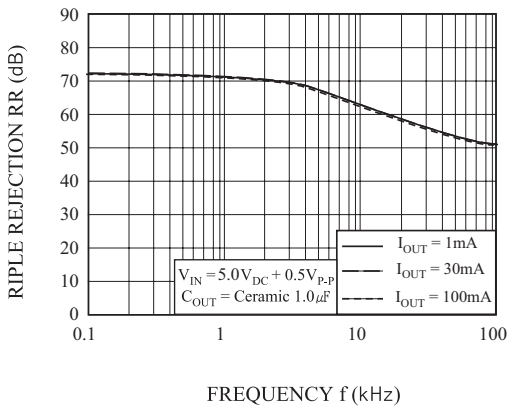

5) INPUT LINE TRANSIENT RESPONSE(I_{OUT} = 30mA, tr = tf = 5us, C_{IN} / C_{OUT} = Ceramic 1.0μF)

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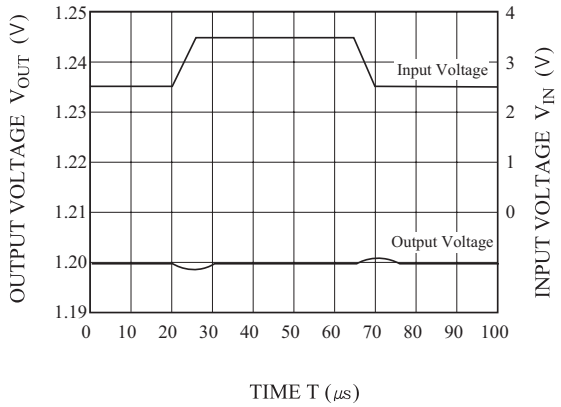

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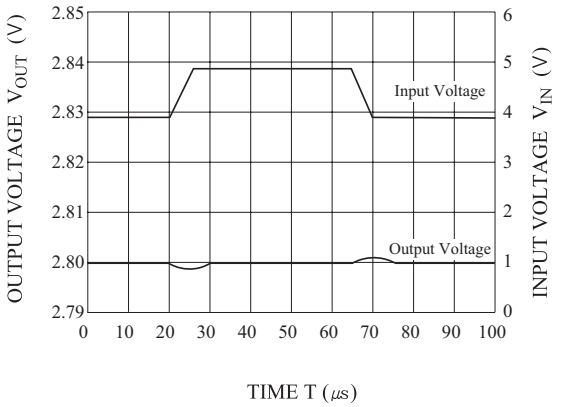

5) LOAD TRANSIENT RESPONSE (tr = tf = 5us, C_{IN} / C_{OUT} = Ceramic 1.0μF)

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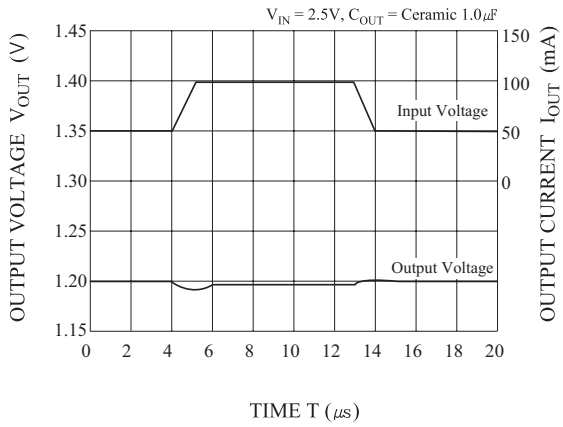

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