

## LOW DROPOUT VOLTAGE REGULATOR WITH ON/OFF CONTROL

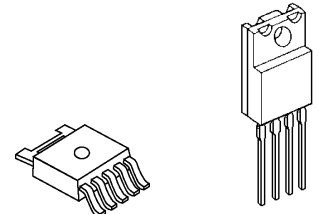
### ■ GENERAL DESCRIPTION

The NJM2386/88 is a general purpose low dropout voltage regulators with ON/OFF control.

The output current is up to 1.0A and dropout voltage is 0.2V typical at 500mA load.

It features high maximum input voltage of 35V for a wide application range including TV, home appliances and power modules.

### ■ PACKAGE OUTLINE



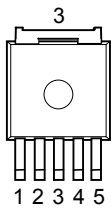
NJM2386DL3

NJM2388F

### ■ FEATURES

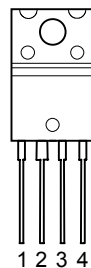
- High Maximum Input Voltage Up to 35V
- Low Dropout Voltage 0.2V typ. at  $I_o=0.5A$
- Output Current  $I_o(max.)=1.0A$
- ON/OFF Control (Active High)
- Internal Short Circuit Current Limit
- Internal Overvoltage Protection
- Internal Thermal Overload Protection
- Bipolar Technology
- Package Outline TO-252-5(NJM2386), TO-220F-4(NJM2388)

### ■ PIN CONFIGURATION



NJM2386DL3

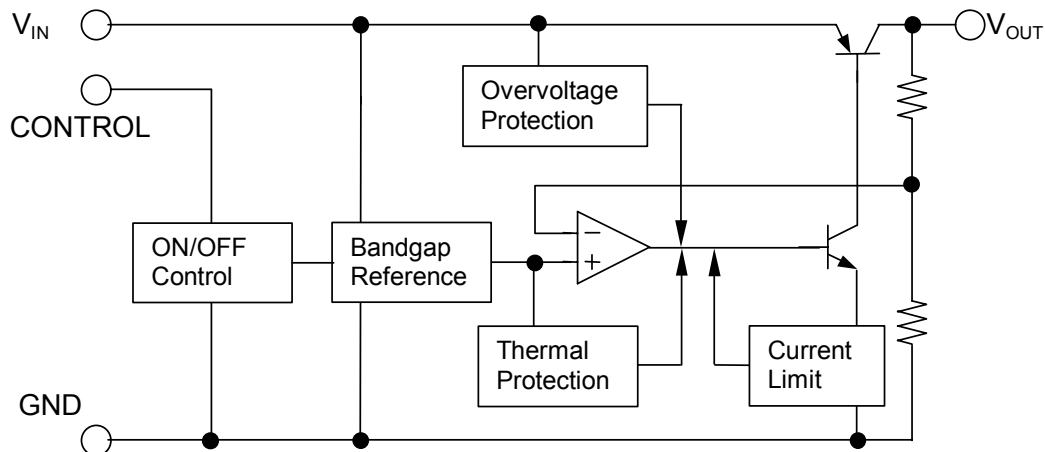
- PIN FUNCTION**
1.  $V_{IN}$
  2. ON/OFF CONTROL
  3.  $V_{OUT}$
  4. N.C.
  5. GND



NJM2388F

- PIN FUNCTION**
1.  $V_{IN}$
  2.  $V_{OUT}$
  3. GND
  4. ON/OFF CONTROL

### ■ EQUIVALENT CIRCUIT



# NJM2386/88

## ■ OUTPUT VOLTAGE RANK LIST

Device Name	V <sub>OUT</sub>
NJM2386DL3-33	3.3V
NJM2386DL3-05	5.0V
NJM2386DL3-63	6.3V
NJM2386DL3-08	8.0V
NJM2386DL3-09	9.0V
NJM2386DL3-12	12.0V

Device Name	V <sub>OUT</sub>
NJM2388F33	3.3V
NJM2388F05	5.0V
NJM2388F63	6.3V
NJM2388F08	8.0V
NJM2388F84	8.4V
NJM2388F09	9.0V
NJM2388F10	10.0V
NJM2388F12	12.0V

## ■ ABSOLUTE MAXIMUM RATINGS

(Ta=25°C)

PARAMETER	SYMBOL	RATINGS		UNIT
Input Voltage	V <sub>IN</sub>	+35		V
Control Voltage	V <sub>CONT</sub>	+35(*1)		V
Output Current	I <sub>o</sub>	1.0		A
Power Dissipation	P <sub>D</sub>	NJM2386	10(Tc<25°C) / 1(Ta<25°C)	W
		NJM2388	18(Tc<50°C)	
Operating Junction Temperature Range	T <sub>j</sub>	-40 ~ +150		°C
Operating Temperature Range	T <sub>opr</sub>	-40 ~ +85		°C
Storage Temperature Range	T <sub>stg</sub>	-50 ~ +150		°C

(\*1): When input voltage is less than +35V, the absolute maximum control voltage is equal to the input voltage.

## ■ ELECTRICAL CHARACTERISTICS (V<sub>IN</sub>=V<sub>O</sub>+1V, I<sub>o</sub>=0.5A, C<sub>IN</sub>=0.33μF, C<sub>o</sub>=22μF, Ta=25°C)

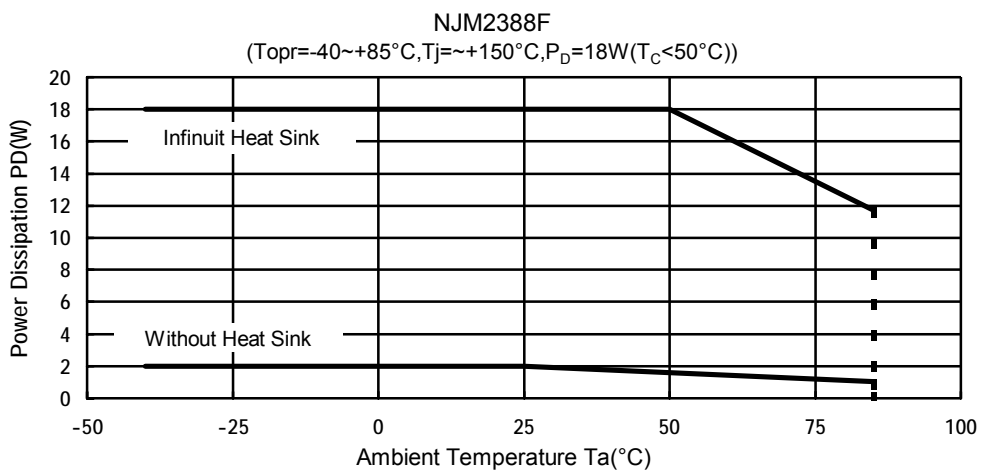
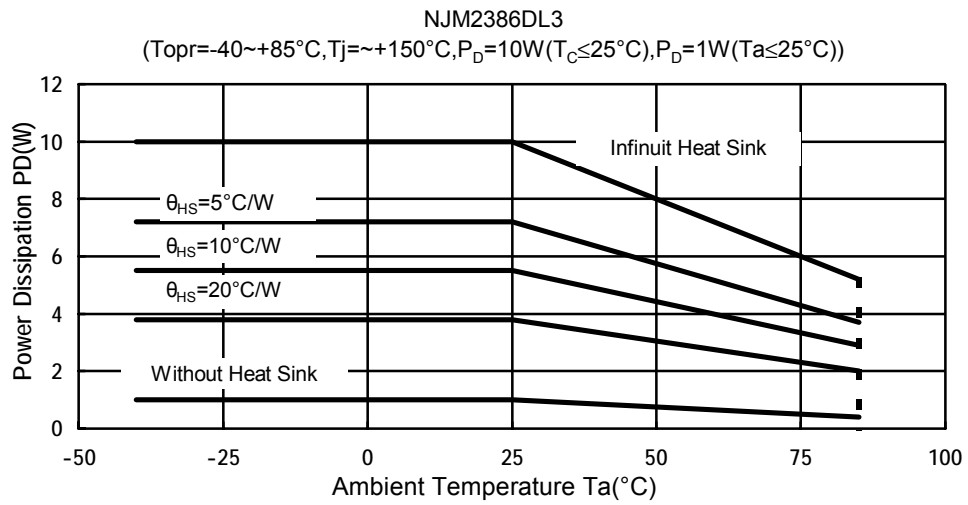
Measurement is to be conducted is pulse testing.

PARAMETER	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Output Voltage	V <sub>o</sub>	V <sub>IN</sub> =V <sub>O</sub> +1V	-2%	-	+2%	V
Line Regulation	ΔV <sub>o</sub> /ΔV <sub>IN</sub>	V <sub>IN</sub> =V <sub>O</sub> +1V ~ V <sub>O</sub> +17V	-	0.04	0.16	%/V
Load Regulation	ΔV <sub>o</sub> /ΔI <sub>o</sub>	V <sub>IN</sub> =V <sub>O</sub> +2V, I <sub>o</sub> =0A ~ 1.0A	-	0.2	1.4	%/A
Average Temperature Coefficient of Output Voltage	ΔV <sub>o</sub> /ΔT	T <sub>j</sub> =0 ~ +125°C	-	±0.02	-	%/°C
Quiescent Current	I <sub>Q</sub>	I <sub>o</sub> =0A	-	-	5	mA
Quiescent Current at Control OFF(*2)	I <sub>Q(OFF)</sub>	V <sub>CONT</sub> =0V	-	-	500	μA
Dropout Voltage	ΔV <sub>I-O</sub>	I <sub>o</sub> =0.5A	-	0.2	0.5	V
Ripple Rejection	NJM238**33	RR V <sub>IN</sub> =V <sub>O</sub> +2V, e <sub>in</sub> =0.5V <sub>rms</sub> , f=120Hz	54	67	-	dB
	NJM238**05		54	67	-	
	NJM238**63		54	67	-	
	NJM238**08		52	65	-	
	NJM238**84		52	65	-	
	NJM238**09		52	65	-	
	NJM238**10		50	63	-	
NJM238**12	50	63	-			
ON Control Voltage	V <sub>CONT(ON)</sub>		2.0(*3)	-	-	V
OFF Control Voltage	V <sub>CONT(OFF)</sub>		-	-	0.4	V
ON Control Current	I <sub>CONT(ON)</sub>	V <sub>C</sub> =2.7V	-	-	20	μA
OFF Control Current	I <sub>CONT(OFF)</sub>	V <sub>C</sub> =0.4V	-	-	-20	μA

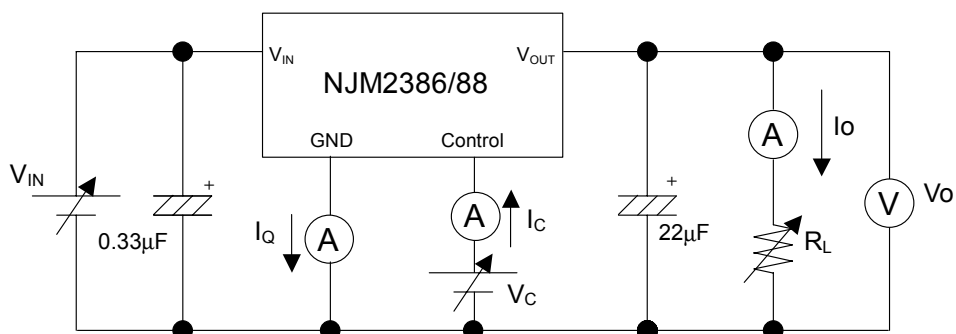
(\*2) This electrical characteristics is applied to NJM2388.

(\*3): When ON/OFF CONTROL Terminal is open, Output Voltage is ON.

## POWER DISSIPATION vs. AMBIENT TEMPERATURE



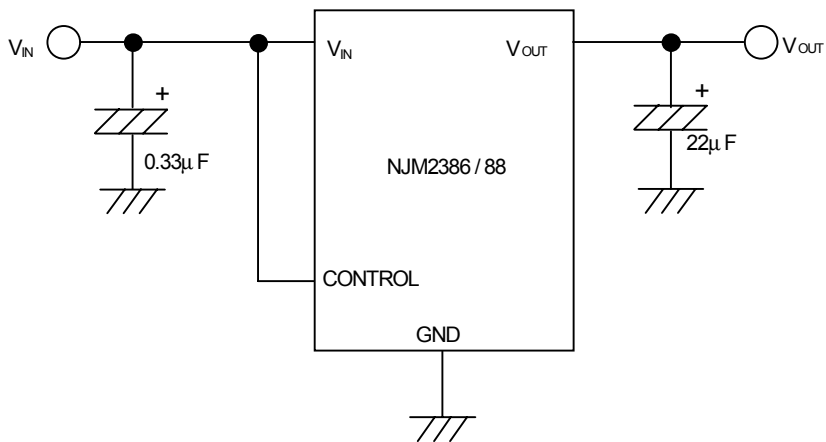
## TEST CIRCUIT



# NJM2386/88

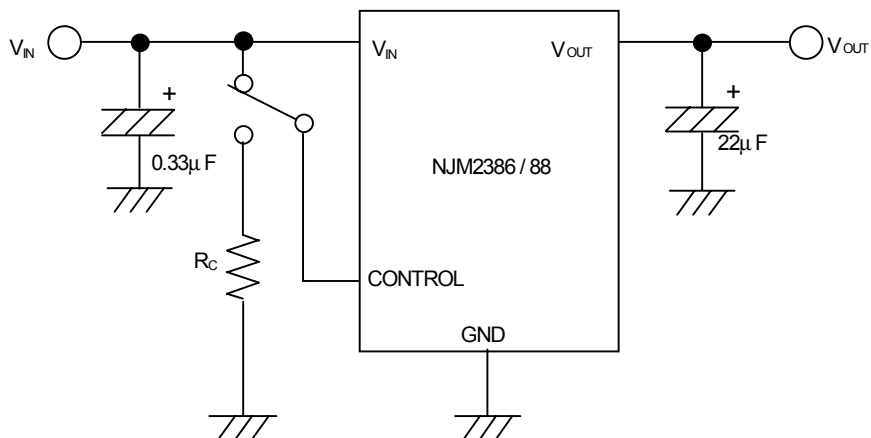
## ■ TYPICAL APPLICATION

① In the case where ON/OFF Control is not required:



Connect control terminal to  $V_{IN}$  terminal or open.

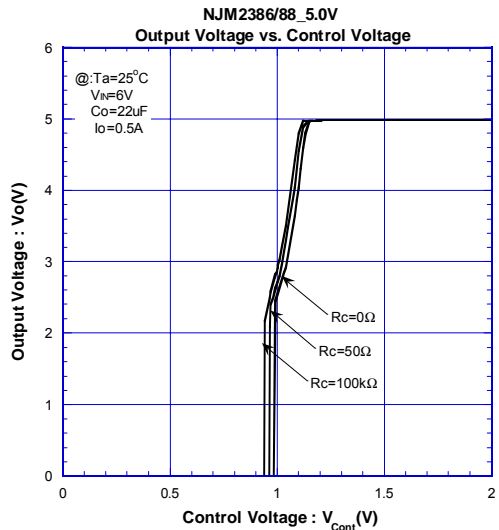
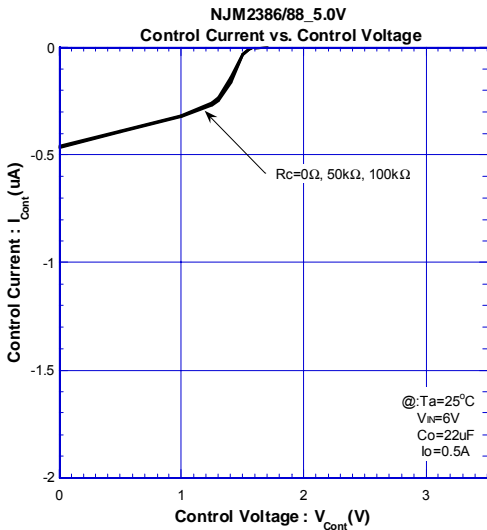
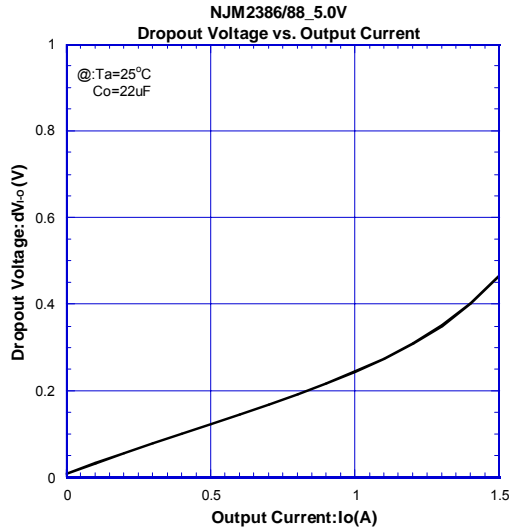
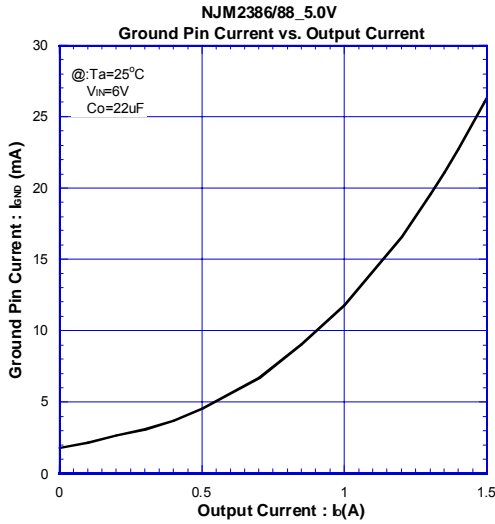
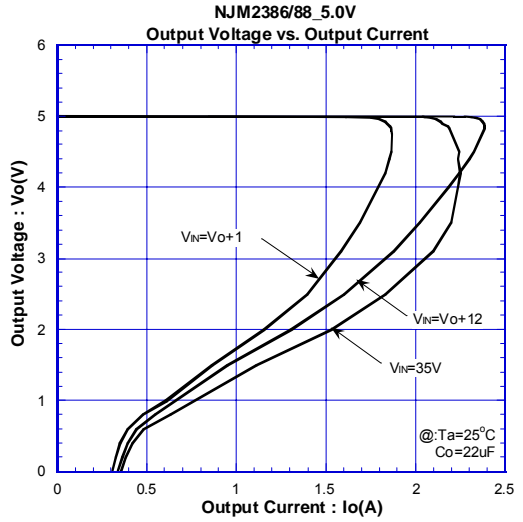
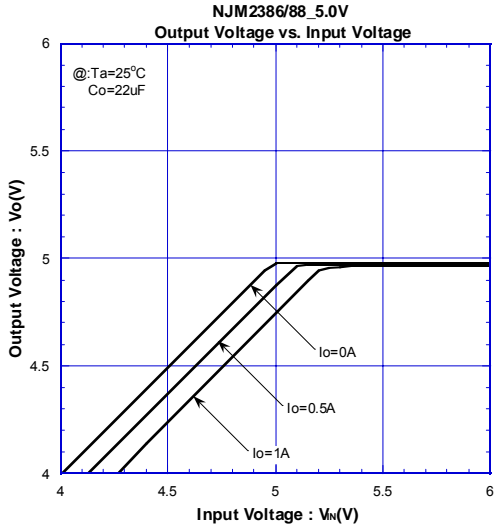
② In use of ON/OFF CONTROL:



State of control terminal:

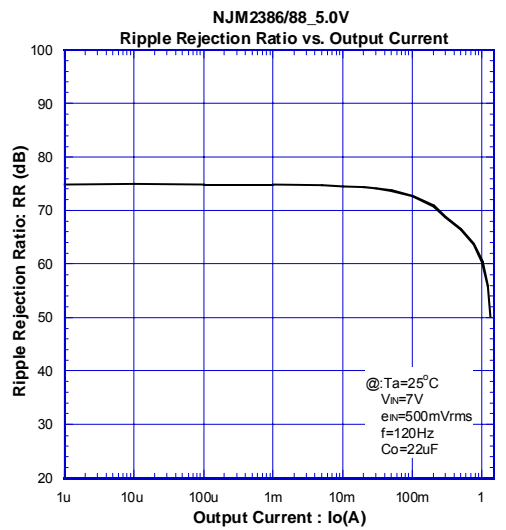
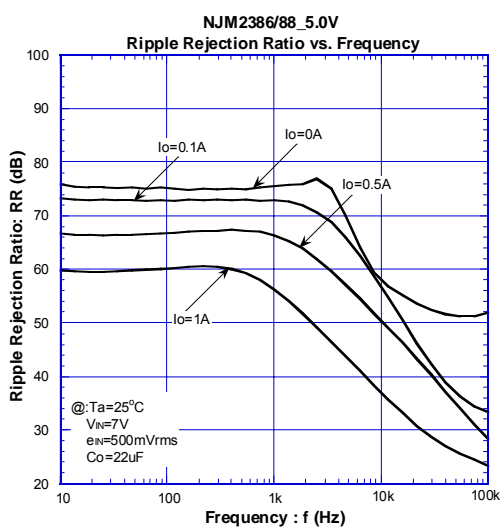
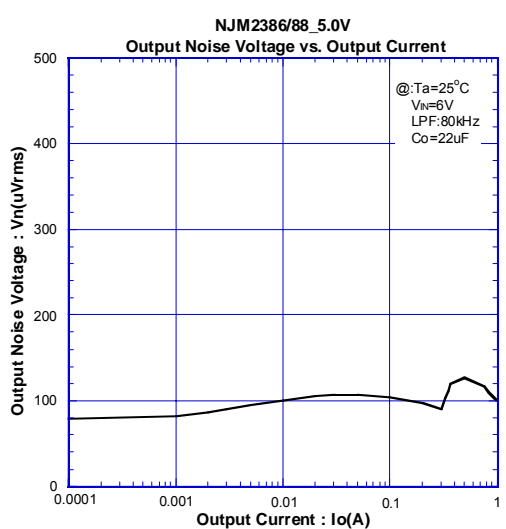
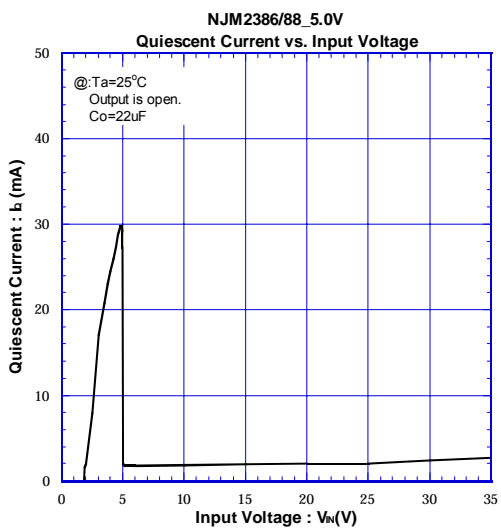
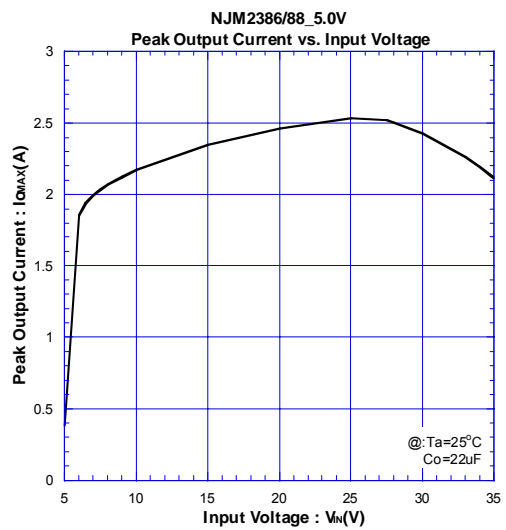
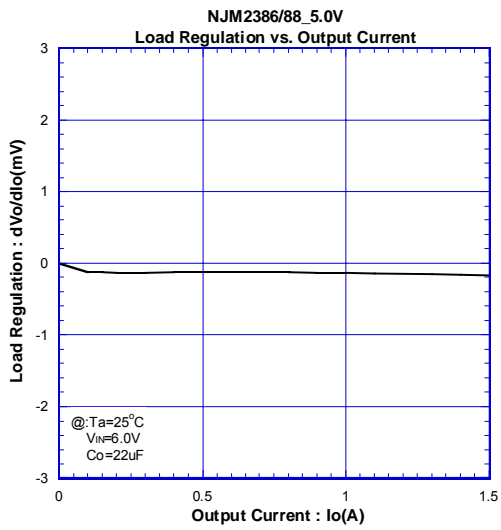
- “H” or “open” → output is enabled.
- “L” → output is disabled.

■ TYPICAL CHARACTERISTICS

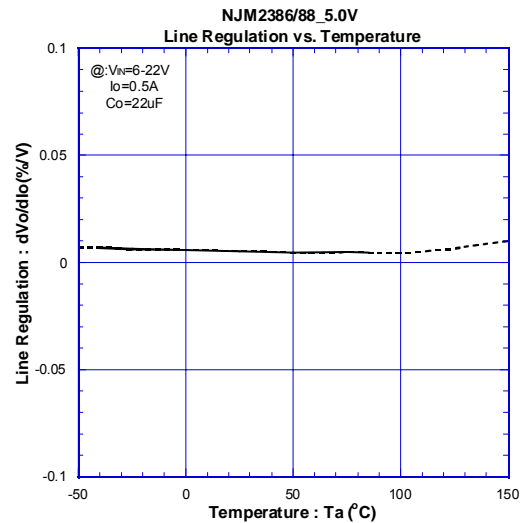
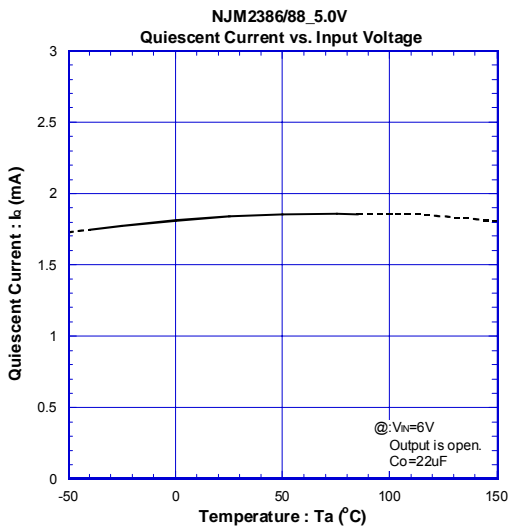
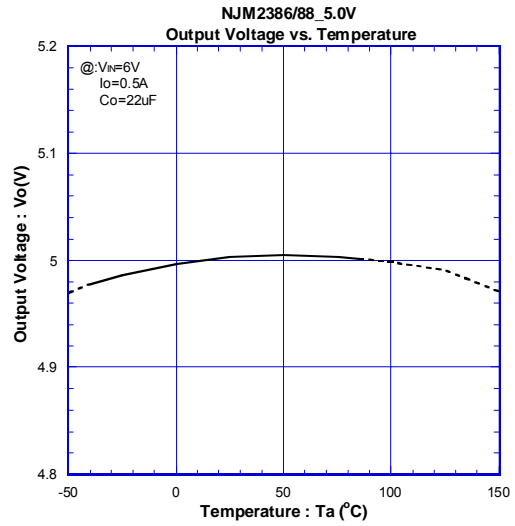
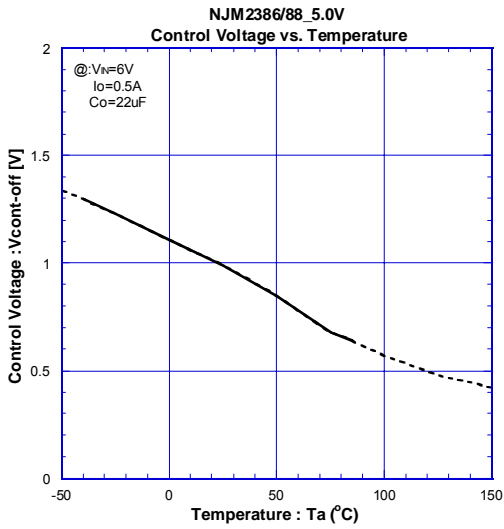
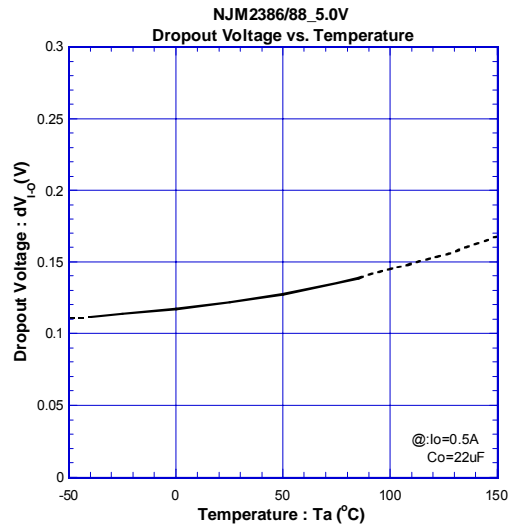
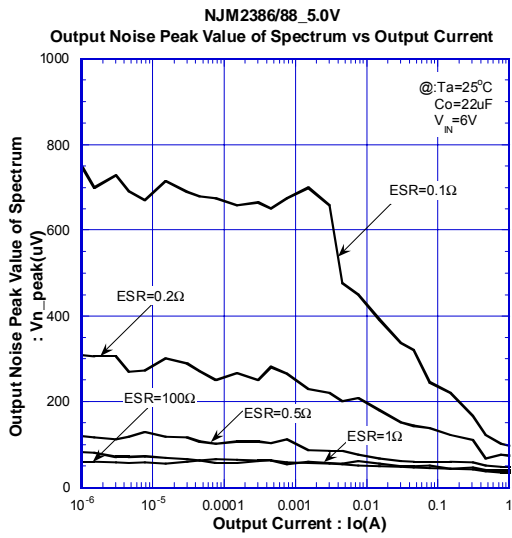


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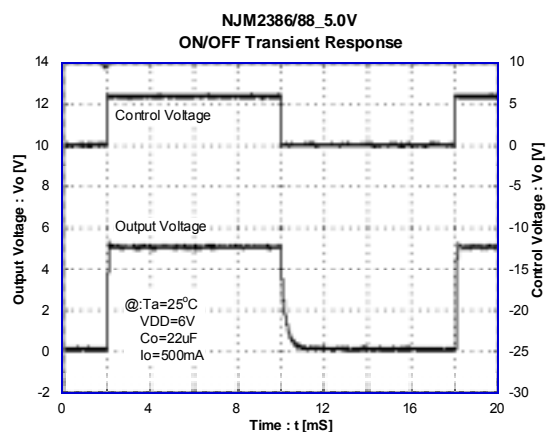
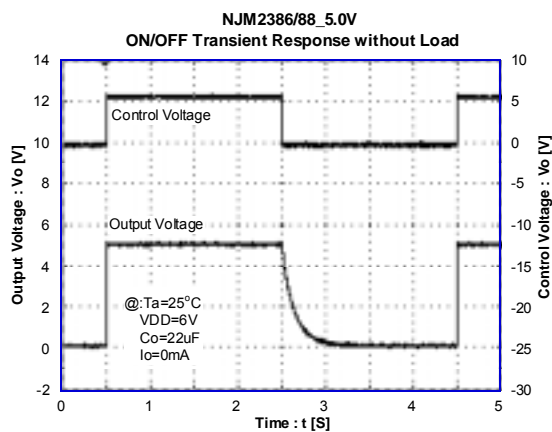
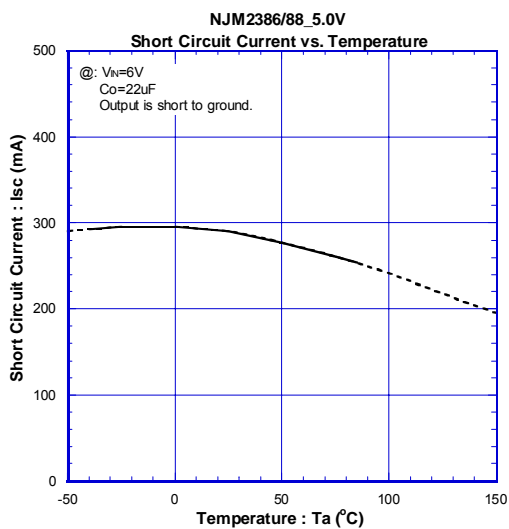
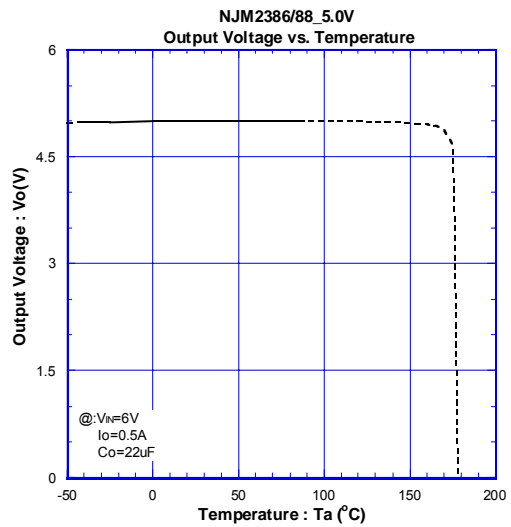
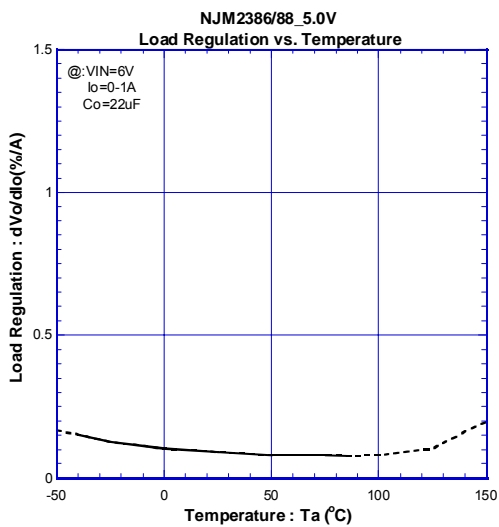


## TYPICAL CHARACTERISTICS



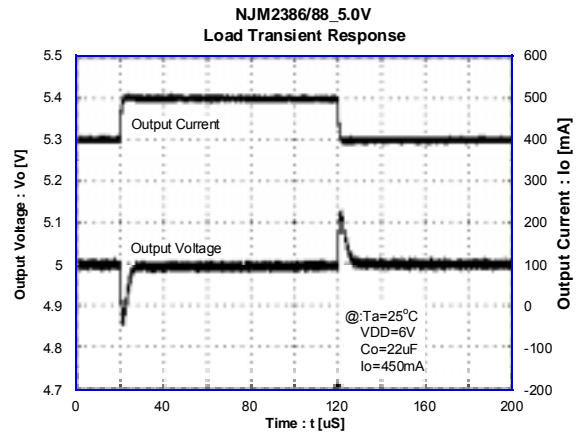
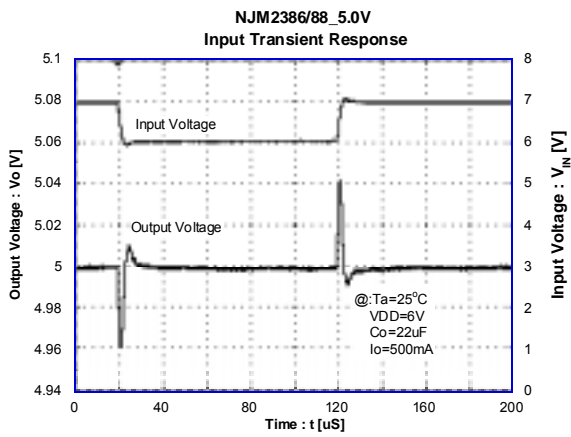
# NJM2386/88

## TYPICAL CHARACTERISTICS





## TYPICAL CHARACTERISTICS



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