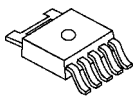
ADJUSTABLE LOW DROPOUT VOLTAGE REGULATOR

WITH ON/OFF CONTROL

■ GENERAL DESCRIPTION

The NJM2387A is an adjustable low dropout voltage regulator.
The output current is up to 1.0A and dropout voltage is 0.2V typ. at Io=0.5A.
OFF control quiescent current is drastically reduced compare with the current NJM2387 through changing ON/OFF control circuit.
The NJM2387A is suitable for power module, TV, Display, car stereo and low power applications.

■ PACKAGE OUTLINE

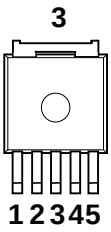


NJM2387ADL3

■ FEATURES

- Low Dropout Voltage ΔV_{I-O}=0.2V typ. at Io=0.5A
- Output Current Io(max.)=1.0A
- Reference Voltage Vref=1.26V ± 2%
- ON/OFF Control
- Internal Short Circuit Current Limit
- Internal Overvoltage Protection
- Internal Thermal Overload Protection
- Bipolar Technology
- Package Outline TO-252-5

■ PIN CONFIGURATION



PIN FUNCTION
1.V_{IN}
2.ON/OFF CONTROL
3.V_{OUT}
4.V_{ADJ}
5.GND

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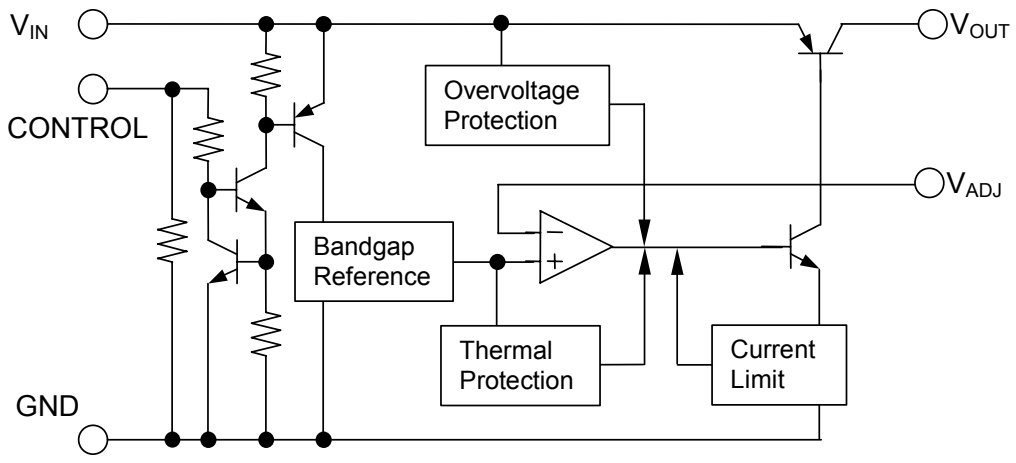
■ EQUIVALENT CIRCUIT



NJM2387ADL3

■ ABSOLUTE MAXIMUM RATINGS (Ta=25°C)

PARAMETER	SYMBOL	RATINGS	UNIT
Input Voltage	V_{IN}	+35	V
Control Voltage	V_{CONT}	+35(*1)	V
Adjust Terminal Voltage	V_{ADJ}	+6	V
Output Current	Io	1.0	A
Power Dissipation	P_D	10(Tc≤25°C) / 1(Ta≤25°C)	W
Operating Junction Temperature Range	Tj	-40 ~ +150	°C
Operating Temperature Range	Topr	-40 ~ +85	°C
Storage Temperature Range	Tstg	-50 ~ +150	°C

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

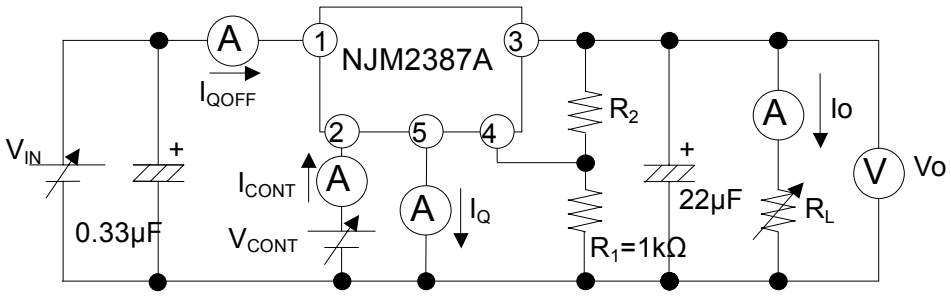
■ ELECTRICAL CHARACTERISTICS (V_{IN}=15V, V_O=10V, Io=0.5A, R1=1kΩ, C_{IN}=0.33μF, Co=22μF, Tj=25°C)

Measurement is conducted by pulse testing.

PARAMETER	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Input Voltage	V_{IN}	-	3.8	-	30	V
Output Voltage	$V_{O(ADJ)}$	-	1.5	-	20	V
Reference Voltage	Vref	-	1.235	1.26	1.285	V
Line Regulation	$\Delta Vo/\Delta V_{IN}$	$V_{IN}=V_O+1V \sim V_O+17V$	-	0.04	0.16	%/V
Load Regulation	$\Delta Vo/\Delta Io$	$V_{IN}=V_O+2V$,Io=0A ~ 1.0A	-	0.2	1.4	%/A
Average Temperature Coefficient of Output Voltage	$\Delta Vo/\Delta T$	Tj=0 ~ +125°C	-	±0.02	-	%/°C
Quiescent Current	I_Q	Io=0A, V_{CONT}=2.7V Except I_{CONT}	-	-	5	mA
OFF Control Quiescent Current	$I_{Q(OFF)}$	V_{CONT}=0V	-	-	1	μA
Dropout Voltage	ΔV_{I-O}	Io=0.5A	-	0.2	0.5	V
Ripple Rejection	RR	Vin=Vo+2V, ein=0.5Vrms ein=0.5Vrms, f=120Hz	52	65	-	dB
ON Control Voltage	$V_{CONT(ON)}$		2.0(*2)	-	-	V
OFF Control Voltage	$V_{CONT(OFF)}$		-	-	0.4	V
ON Control Current	$I_{CONT(ON)}$	V_C=2.7V	10	30	50	μA
OFF Control Current	$I_{CONT(OFF)}$	V_C=0.4V	1	3	5	μA

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

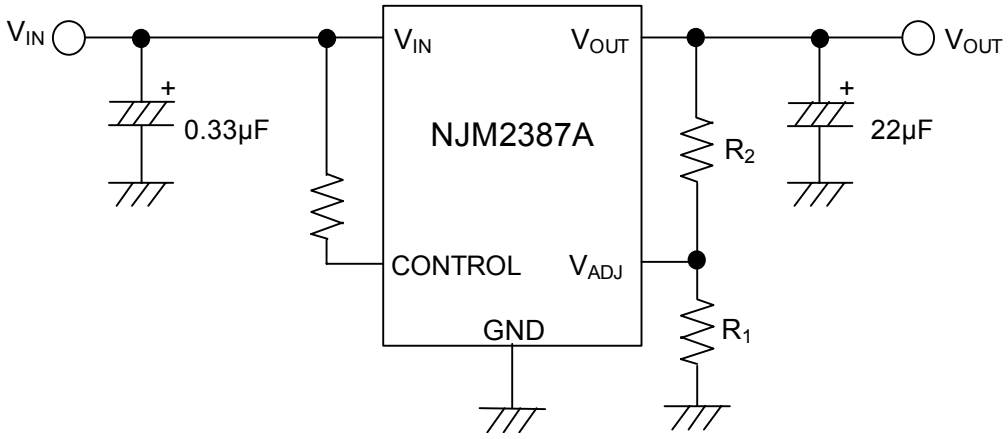
■ TEST CIRCUIT



$$Vo = Vref \times (1 + R2/R1)$$

■ TYPICAL APPLICATION

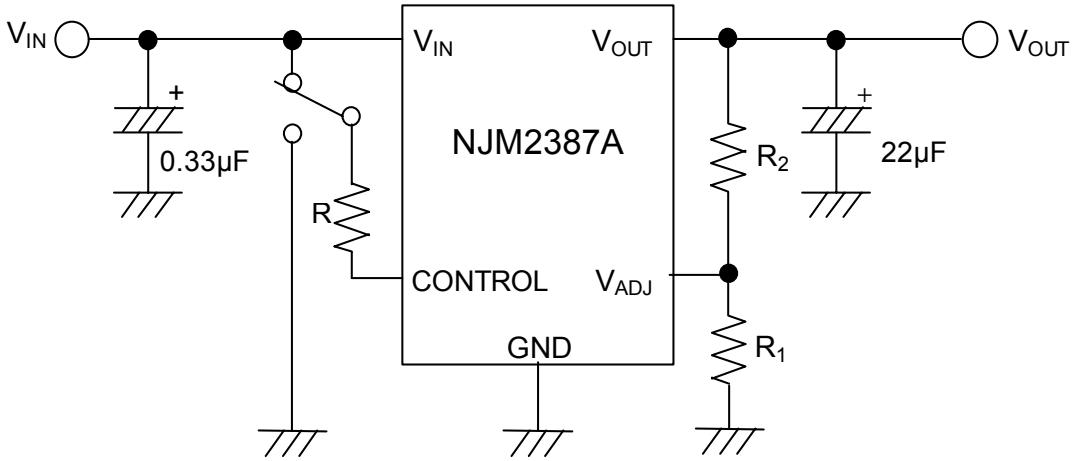
① In the case where ON/OFF Control is not required:



Connect control terminal to V_{IN} terminal.

The quiescent current can be reduced by using a resistance "R". Instead, it increases the minimum operating voltage. For further information, please refer to Figure "Output Voltage vs. Control Voltage".

② In use of ON/OFF CONTROL:

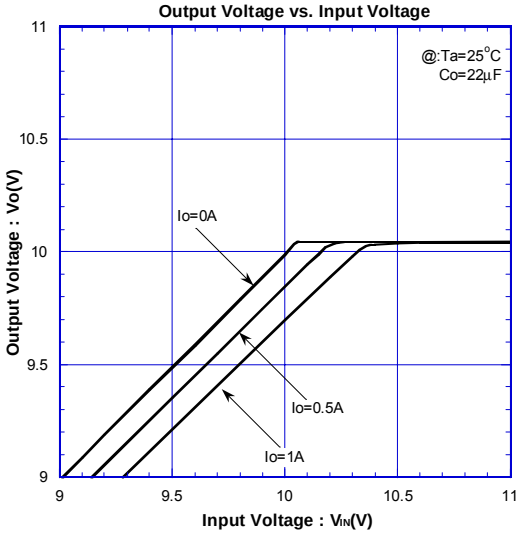


State of control terminal:

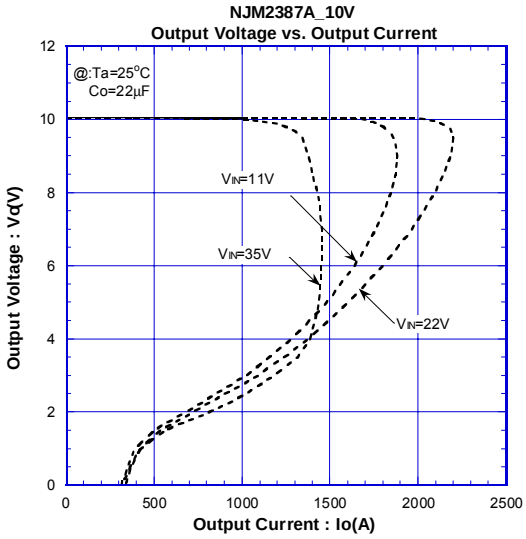
- "H" → output is enabled.
- "L" or "open" → output is disabled.

■ ELECTRICAL CHARACTERISTICS

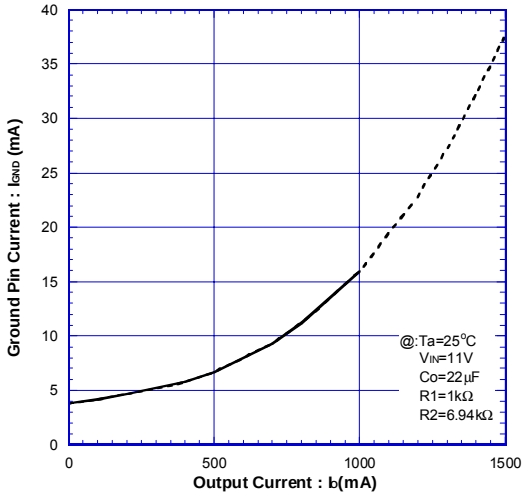
NJM2387A_10V
Output Voltage vs. Input Voltage



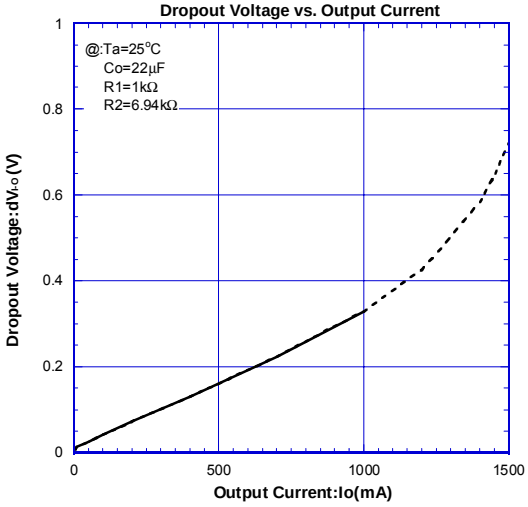
NJM2387A_10V
Output Voltage vs. Output Current



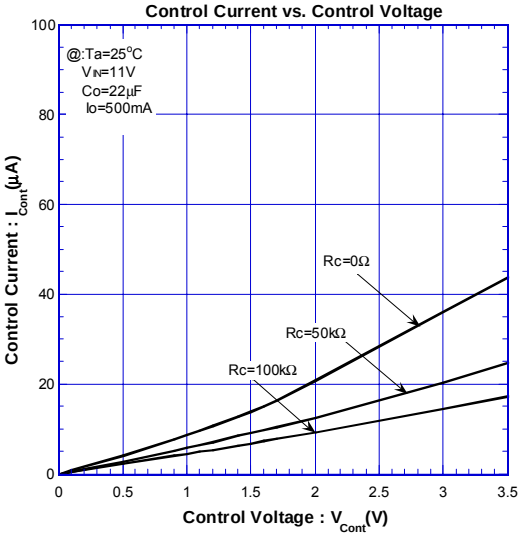
NJM2387A_10V
Ground Pin Current v.s. Output Current



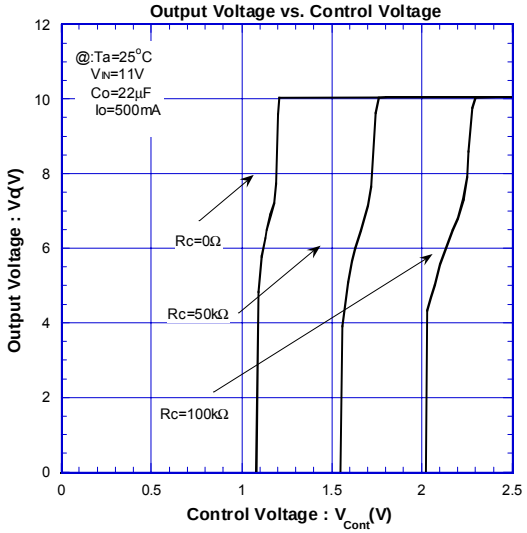
NJM2387A_10V
Dropout Voltage vs. Output Current



NJM2387A_10V
Control Current vs. Control Voltage

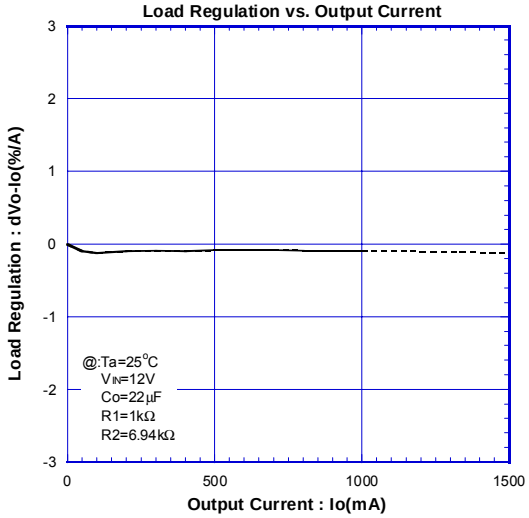


NJM2387A_10V
Output Voltage vs. Control Voltage

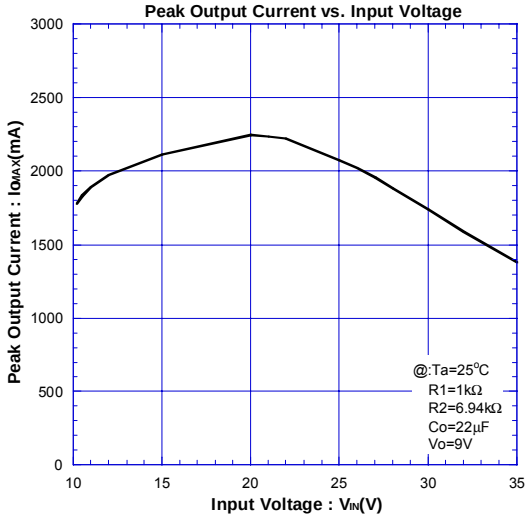


■ ELECTRICAL CHARACTERISTICS

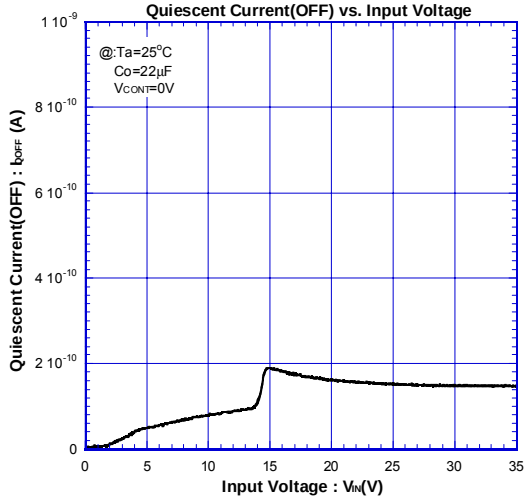
NJM2387A_10V
Load Regulation vs. Output Current



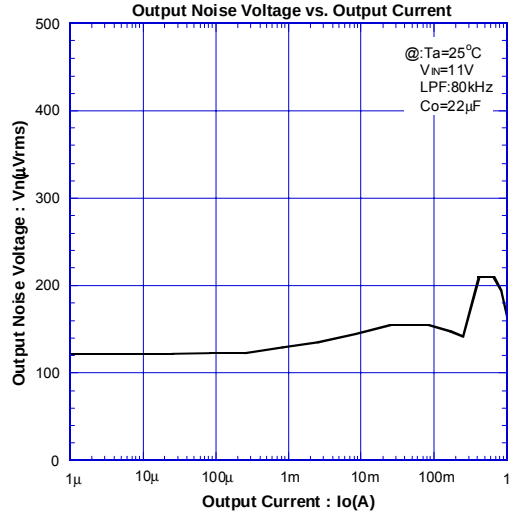
NJM2387A_10V
Peak Output Current vs. Input Voltage



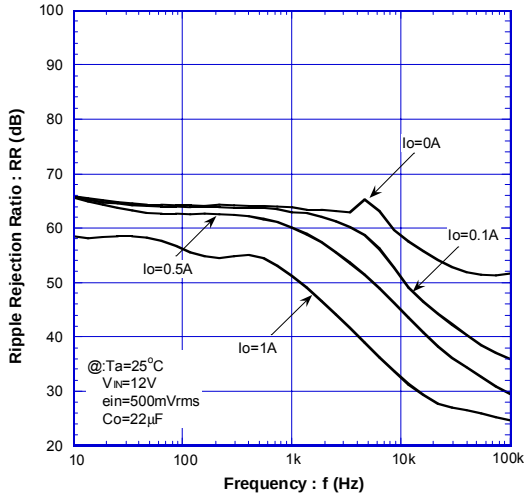
NJM2387A_10V
Quiescent Current(OFF) vs. Input Voltage



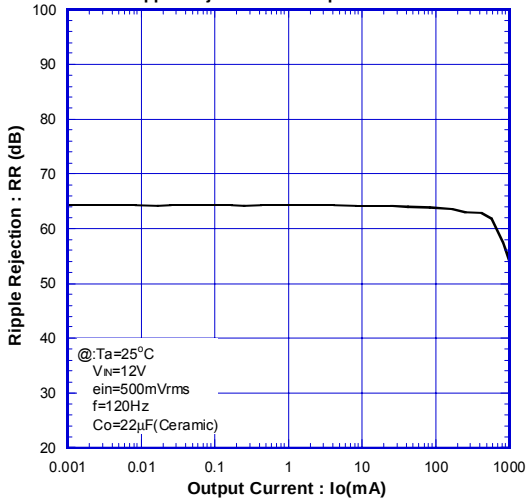
NJM2387A_10V
Output Noise Voltage vs. Output Current



NJM2387A_10V
Ripple Rejection Ratio v.s. Frequency



NJM2387A_10V
Ripple Rejection vs. Output Current



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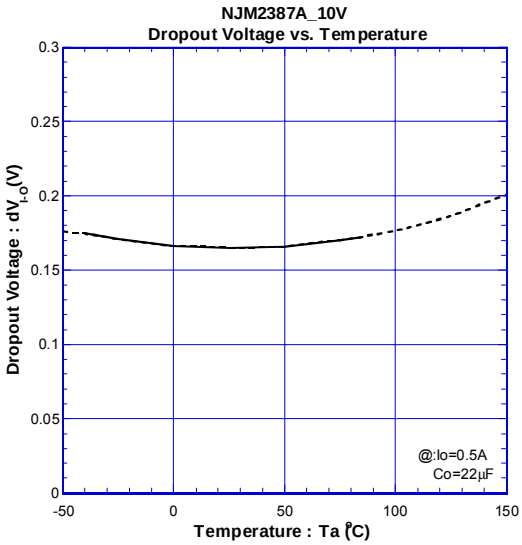

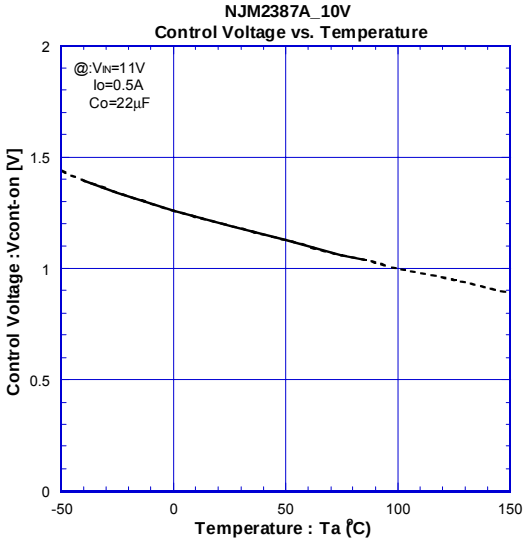

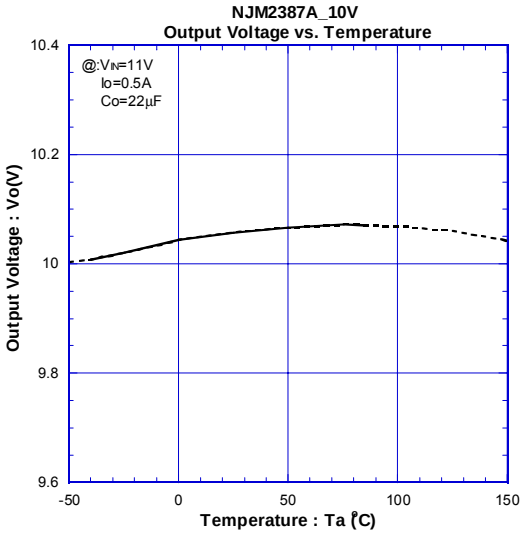

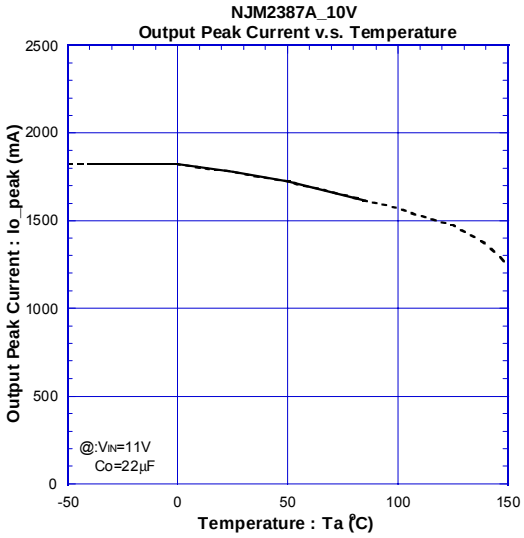

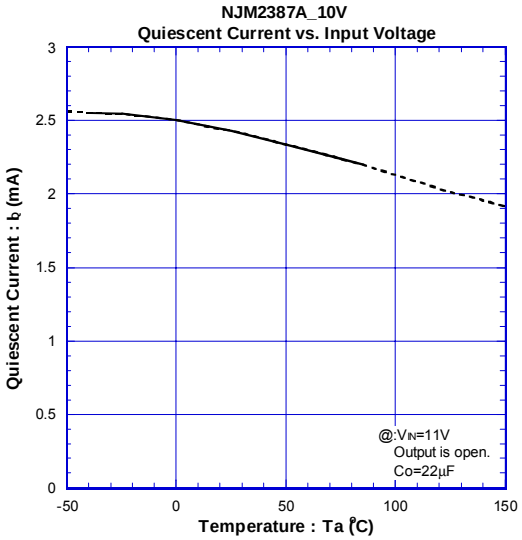

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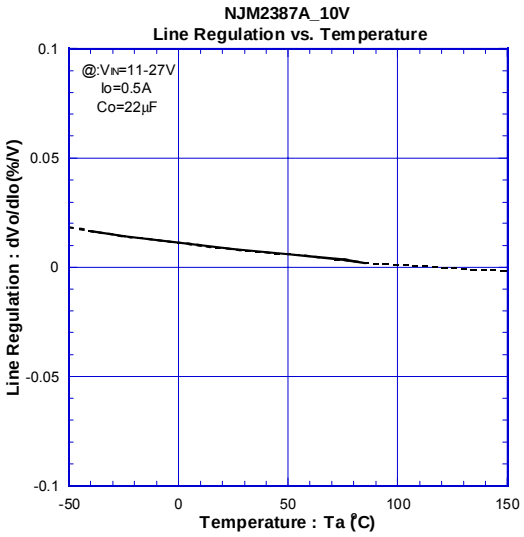

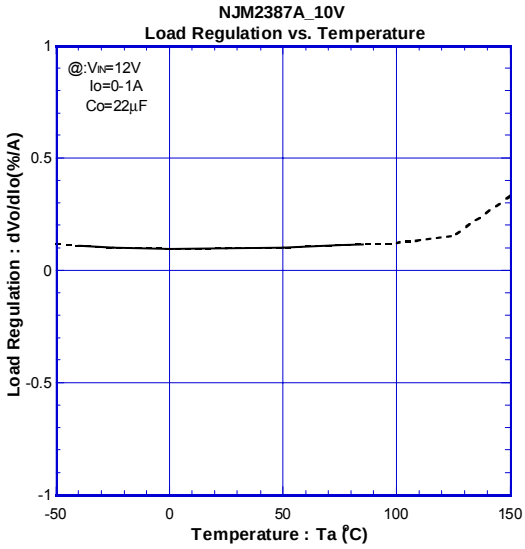

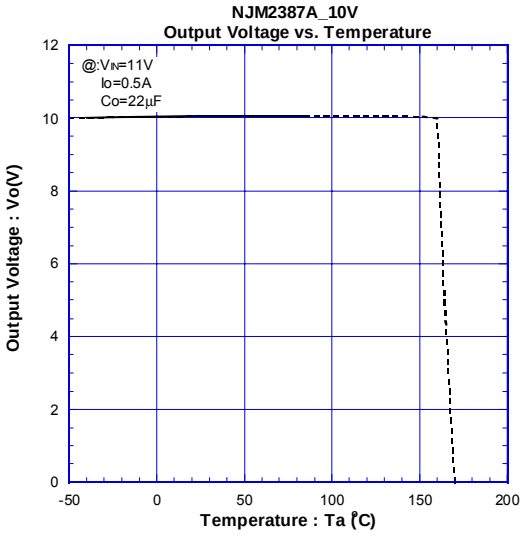

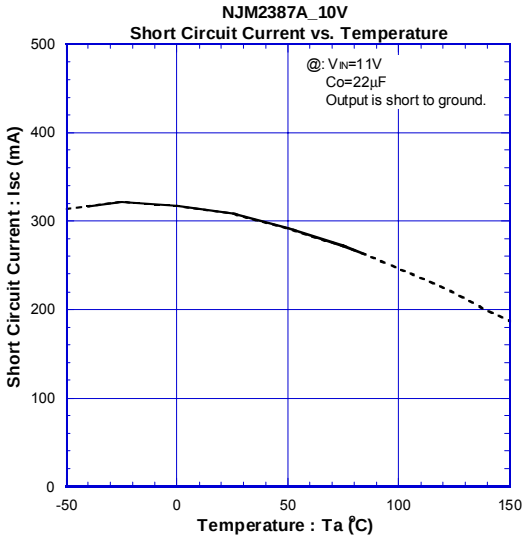

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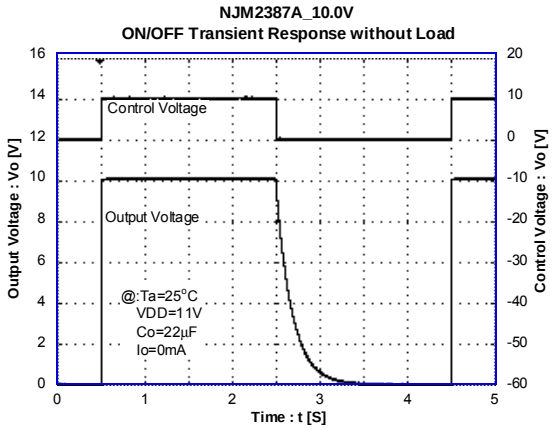

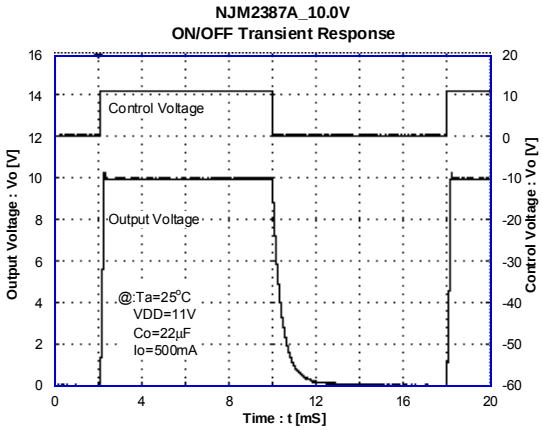

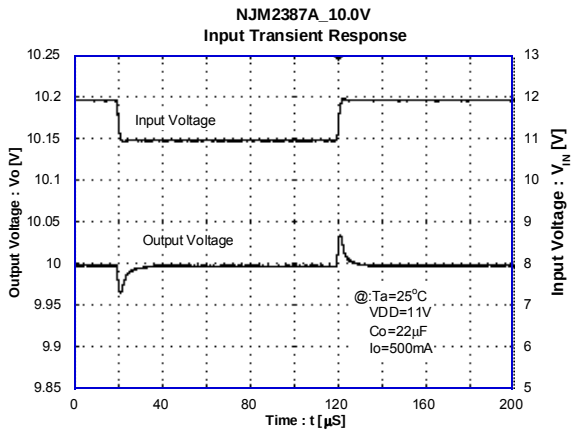

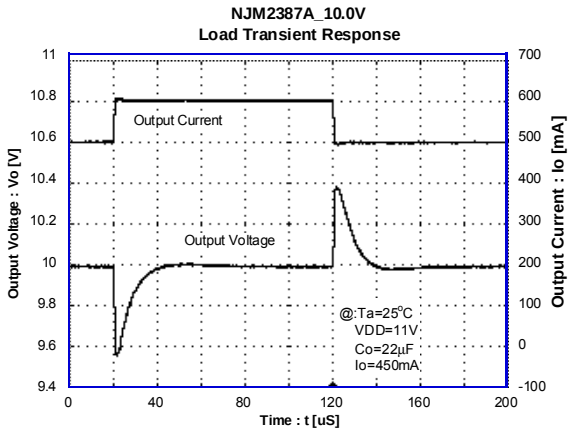

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