

ADJUSTABLE LOW DROPOUT VOLTAGE REGULATOR WITH ON/OFF CONTROL

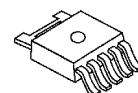
■ GENERAL DESCRIPTION

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 $I_o=0.5A$.

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

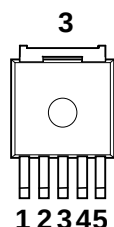


NJM2387ADL3

■ FEATURES

- Low Dropout Voltage $\Delta V_{I-O}=0.2V$ typ. at $I_o=0.5A$
- Output Current $I_o(\text{max.})=1.0A$
- Reference Voltage $V_{ref}=1.26V \pm 2\%$
- ON/OFF Control
- Internal Short Circuit Current Limit
- Internal Overvoltage Protection
- Internal Thermal Overload Protection
- Bipolar Technology
- Package Outline TO-252-5

■ PIN CONFIGURATION

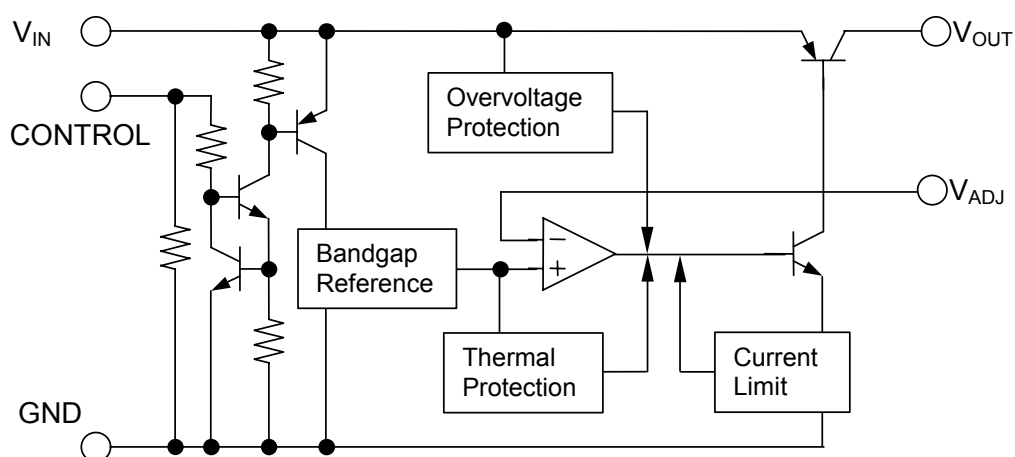


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PIN FUNCTION

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

■ EQUIVALENT CIRCUIT



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■ 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	I_O	1.0	A
Power Dissipation	P_D	$10(T_C \leq 25^\circ\text{C}) / 1(T_A \leq 25^\circ\text{C})$	W
Operating Junction Temperature Range	T_J	-40 ~ +150	°C
Operating Temperature Range	T_{opr}	-40 ~ +85	°C
Storage Temperature Range	T_{stg}	-50 ~ +150	°C

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

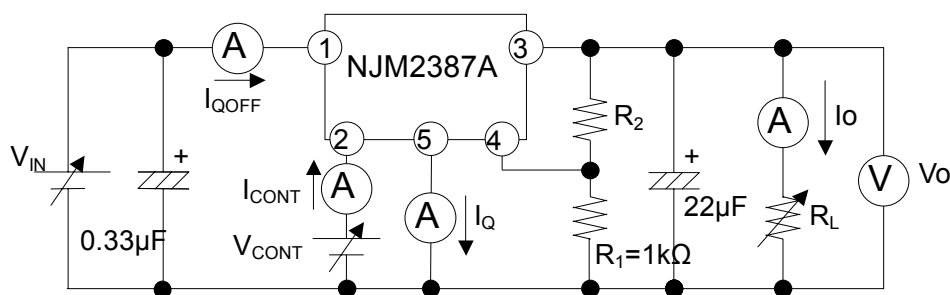
■ ELECTRICAL CHARACTERISTICS ($V_{IN}=15V$, $V_O=10V$, $I_O=0.5A$, $R_1=1k\Omega$, $C_{IN}=0.33\mu F$, $C_O=22\mu F$, $T_J=25^\circ\text{C}$)

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	V_{ref}	-	1.235	1.26	1.285	V
Line Regulation	$\Delta V_O / \Delta V_{IN}$	$V_{IN}=V_O+1V \sim V_O+17V$	-	0.04	0.16	%/V
Load Regulation	$\Delta V_O / \Delta I_O$	$V_{IN}=V_O+2V, I_O=0A \sim 1.0A$	-	0.2	1.4	%/A
Average Temperature Coefficient of Output Voltage	$\Delta V_O / \Delta T$	$T_J=0 \sim +125^\circ\text{C}$	-	± 0.02	-	%/°C
Quiescent Current	I_Q	$I_O=0A$, $V_{CONT}=2.7V$ Except I_{CONT}	-	-	5	mA
OFF Control Quiescent Current	$I_{Q(OFF)}$	$V_{CONT}=0V$	-	-	1	μA
Dropout Voltage	ΔV_{I-O}	$I_O=0.5A$	-	0.2	0.5	V
Ripple Rejection	RR	$V_{in}=V_O+2V$, $e_{in}=0.5V_{rms}$ $e_{in}=0.5V_{rms}$, $f=120Hz$	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.

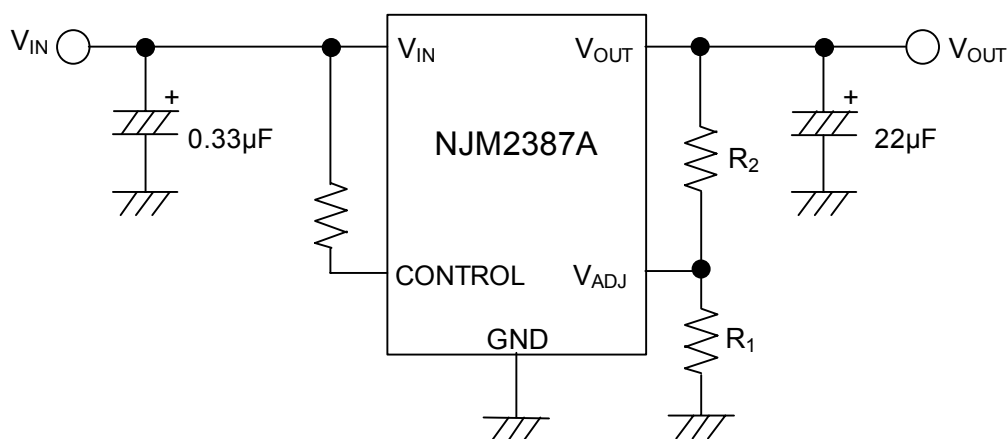
■ TEST CIRCUIT



$$V_o = V_{ref} \times (1 + R_2/R_1)$$

■ TYPICAL APPLICATION

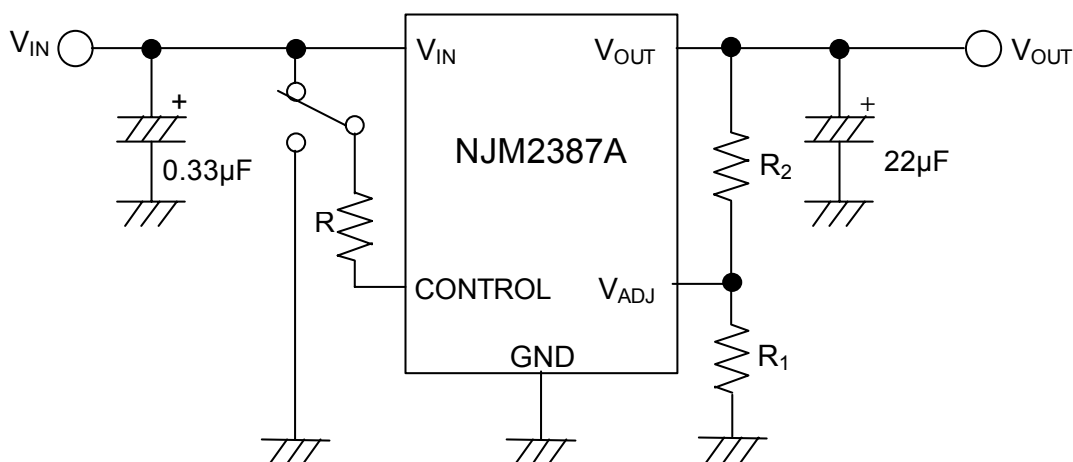
① In the case where ON/OFF Control is not required:



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:

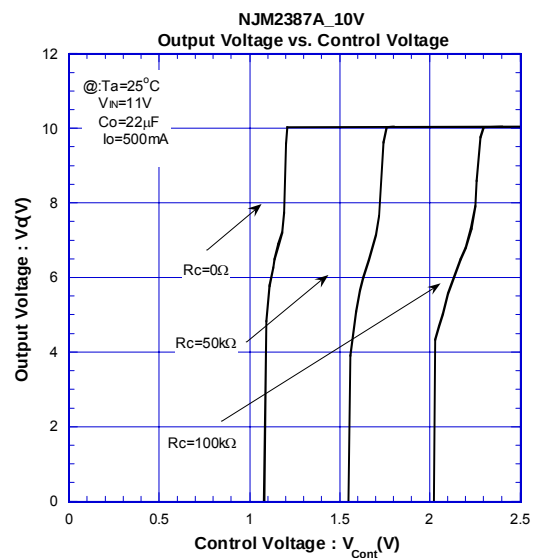
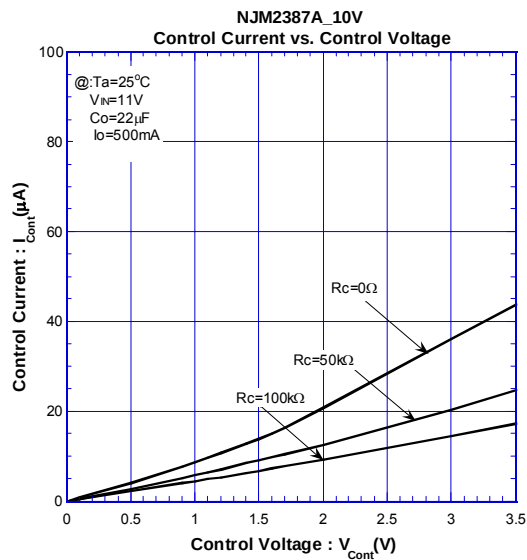
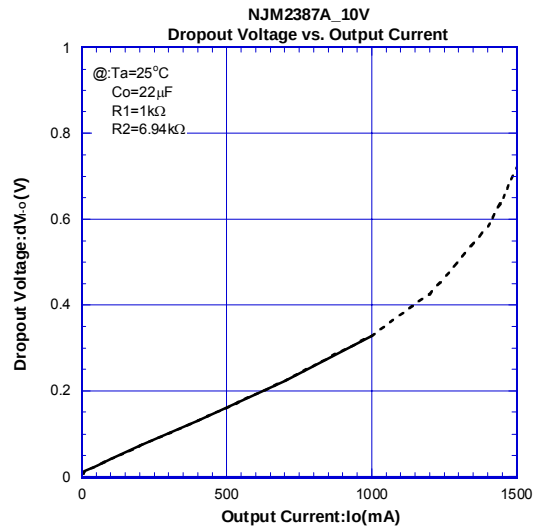
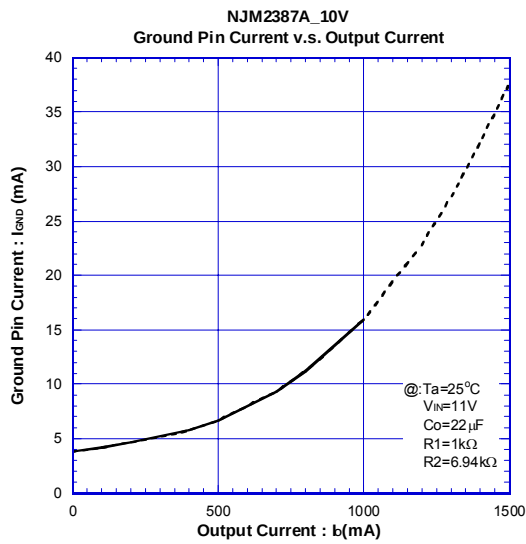
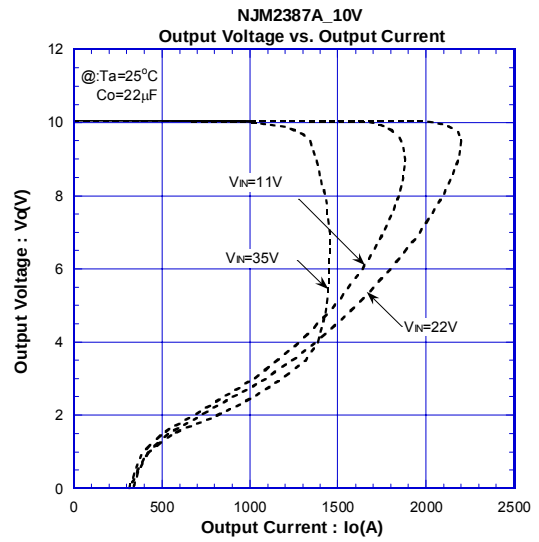
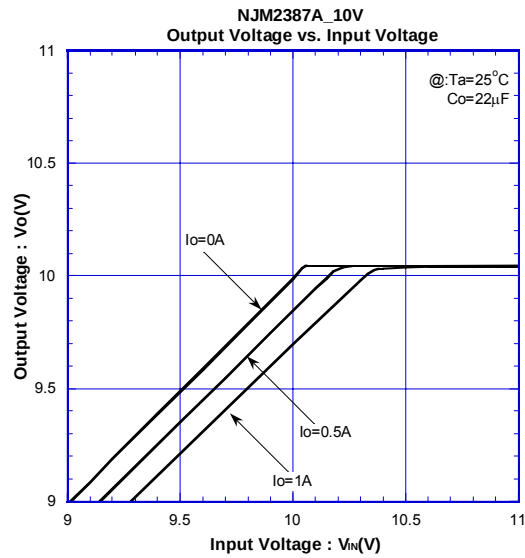


State of control terminal:

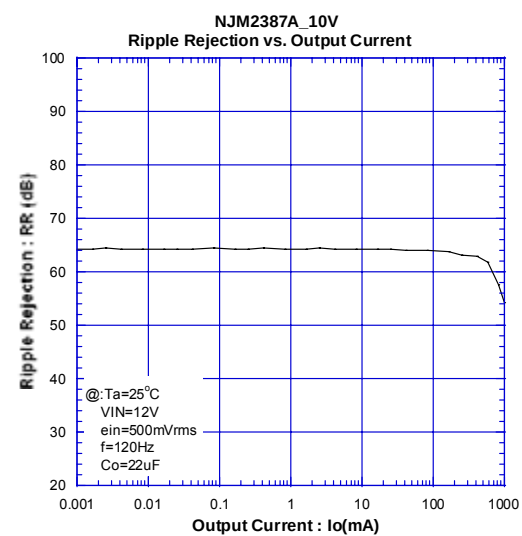
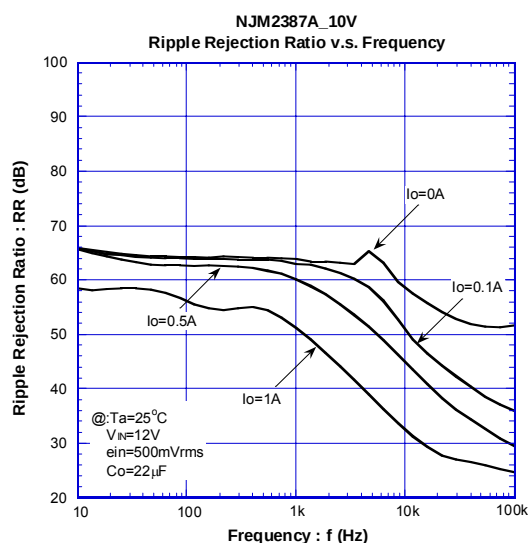
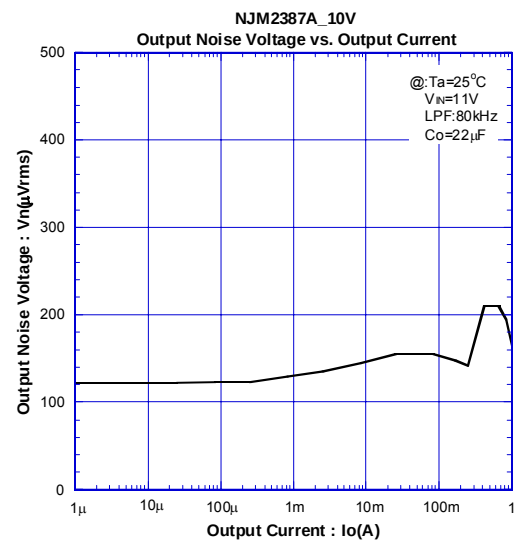
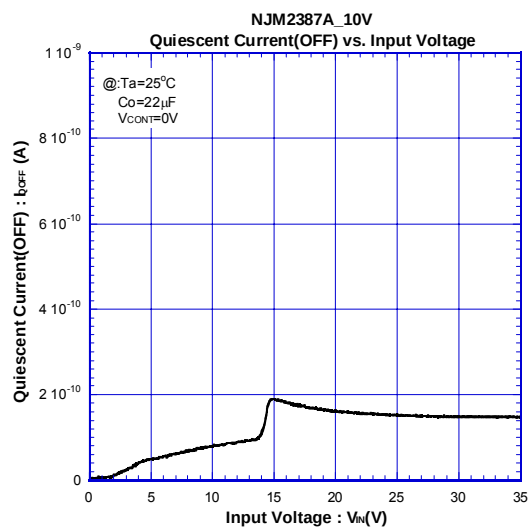
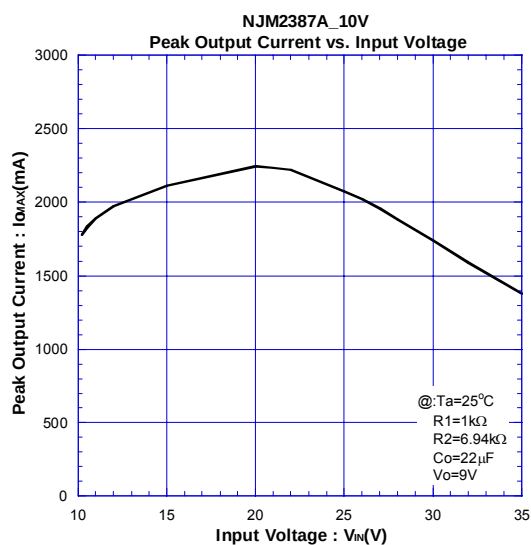
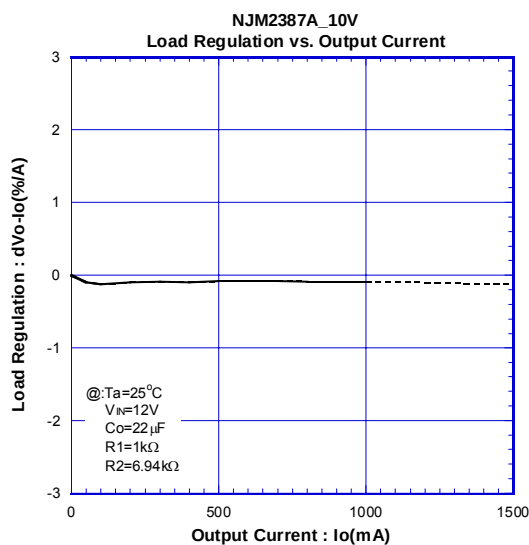
- "H" → output is enabled.
- "L" or "open" → output is disabled.

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■ ELECTRICAL CHARACTERISTICS

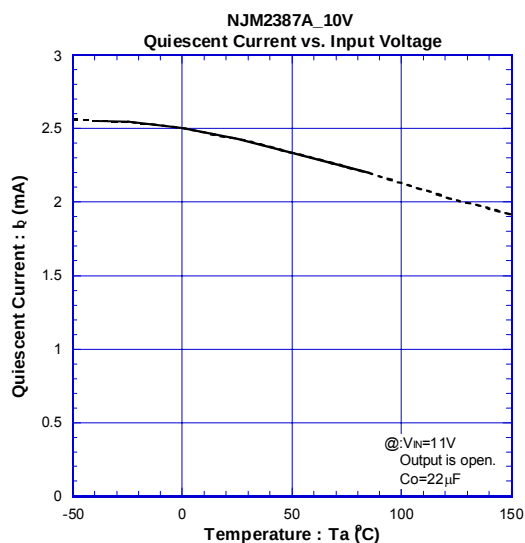
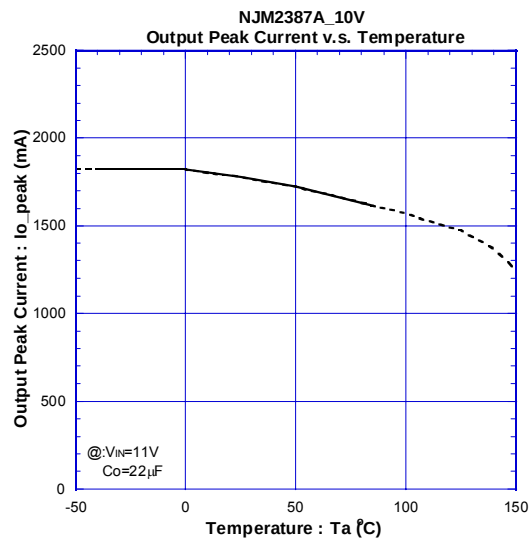
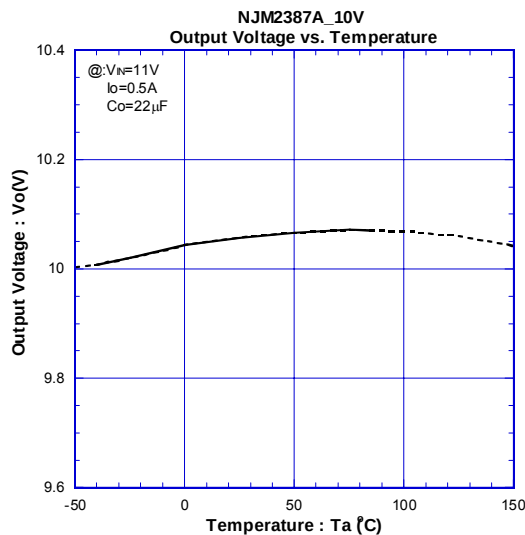
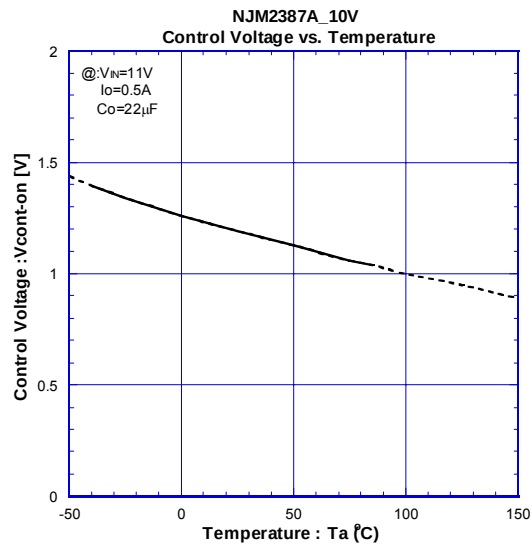
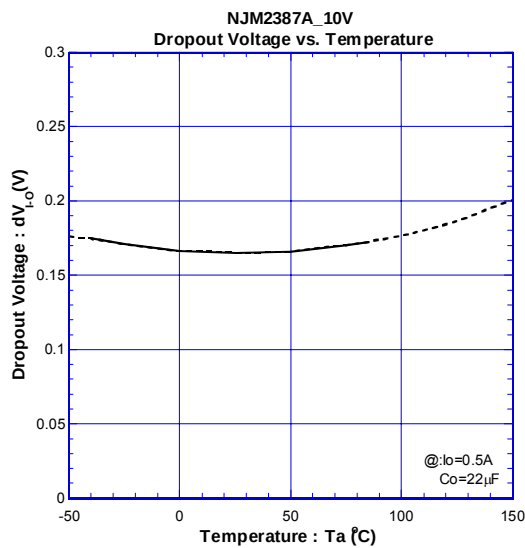


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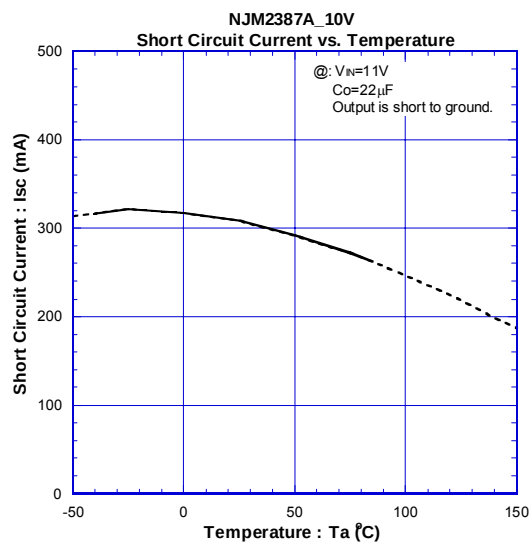
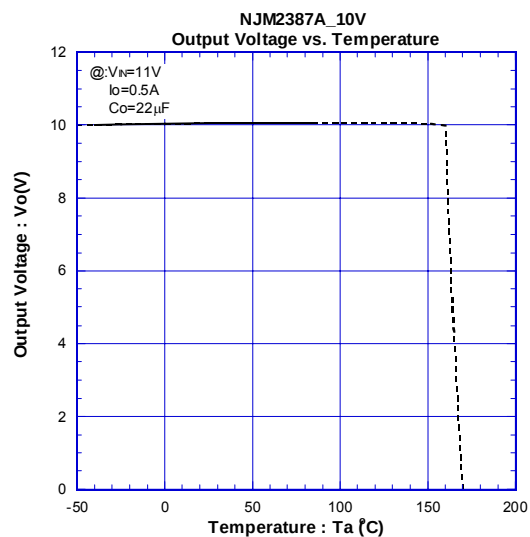
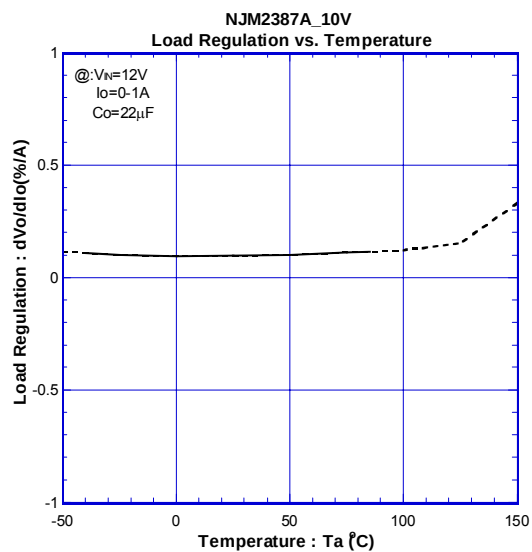
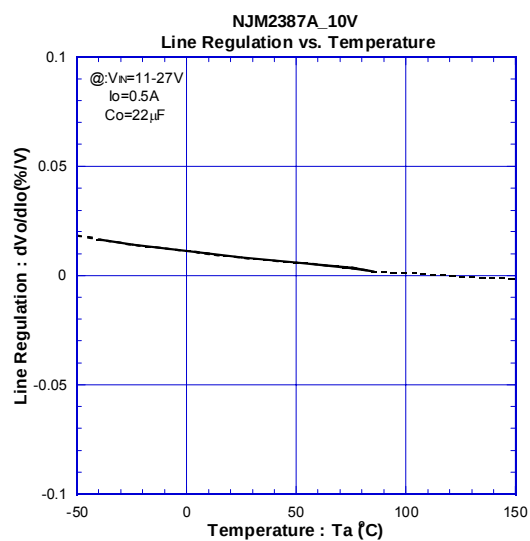


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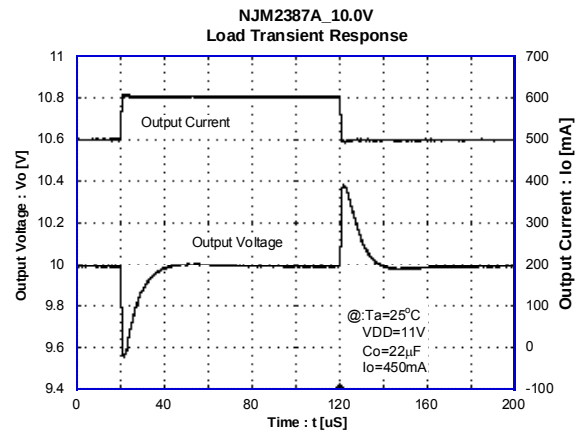
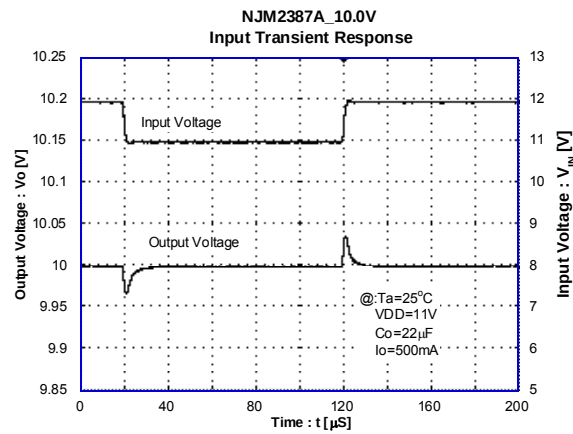
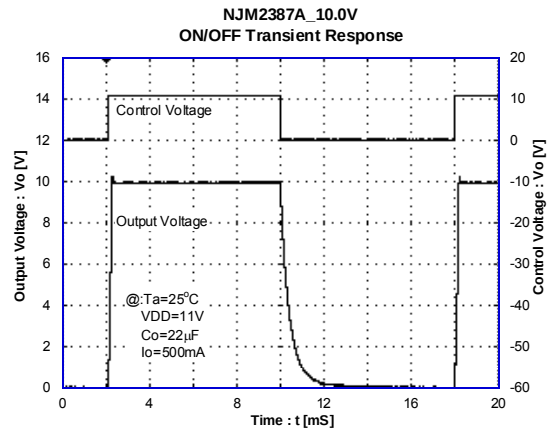
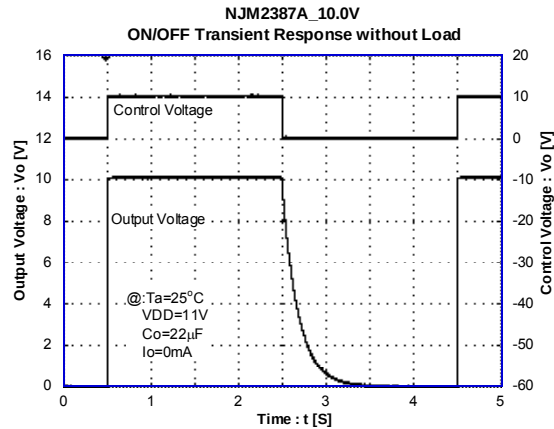
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