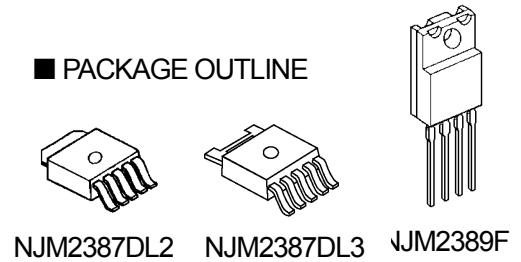


ADJUSTABLE LOW DROPOUT VOLTAGE REGULATOR

■ GENERAL DESCRIPTION

The NJM2387/89 are adjustable low dropout voltage regulators .
 The output current is up to 1.0A and dropout voltage is 0.2V typ. at $I_o=0.5A$. NJM2387 has ON/OFF control circuit and enable to reduce quiescent current.
 The NJM2387/89 is suitable for power module, TV, Display, car stereo and low power applications.

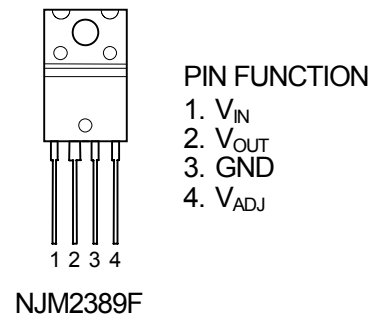
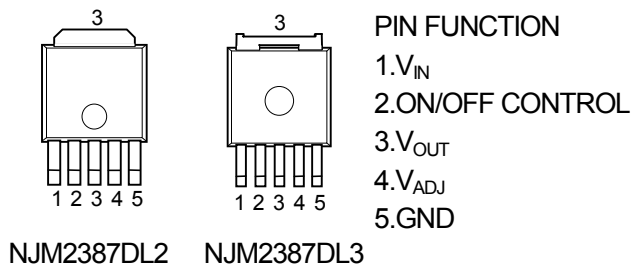
■ PACKAGE OUTLINE



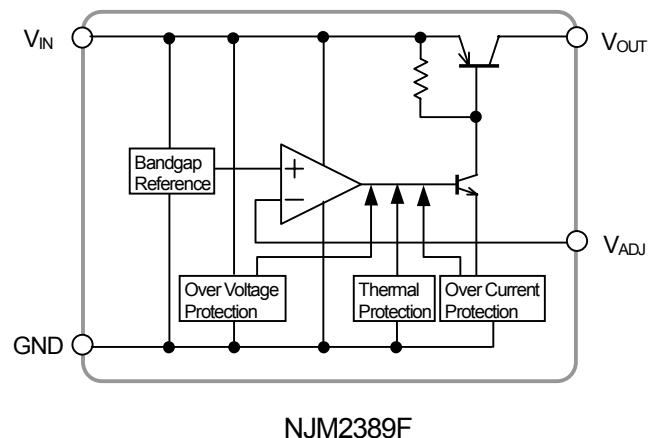
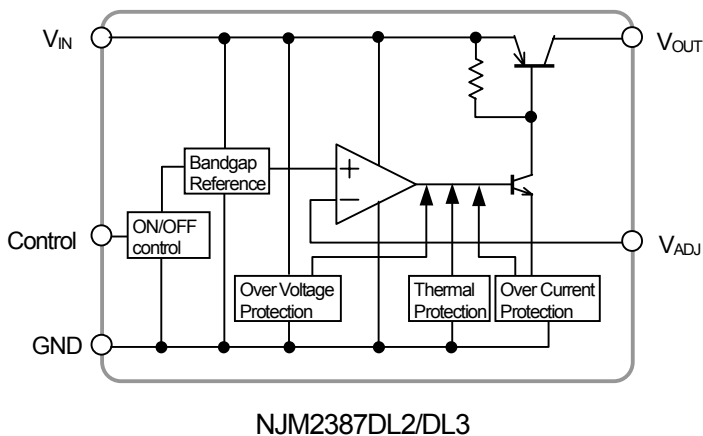
■ FEATURE

- Low Dropout Voltage $\Delta V_{I-O}=0.2V$ typ. at $I_o=0.5A$
- Output Current $I_o(max.)=1.0A$
- Reference Voltage $V_{ref}=1.26V \pm 2\%$
- ON/OFF Control (Active High : Only NJM2387)
- Internal Short Circuit Current Limit
- Internal Thermal Overload Protection
- Bipolar Technology
- Package Outline TO-252-5(NJM2387), TO-220F-4(NJM2389)

■ PIN CONFIGURATION



■ EQUIVALENT CIRCUIT



NJM2387/89

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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	NJM2387	$10(T_C \leq 25^\circ\text{C}) / 1(T_a \leq 25^\circ\text{C})$	W
		NJM2389	$18(T_C < 50^\circ\text{C})$	
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): This applies for NJM2387. When input voltage is less than +35V, the absolute maximum control voltage is equal to the input voltage.

■ NJM2387

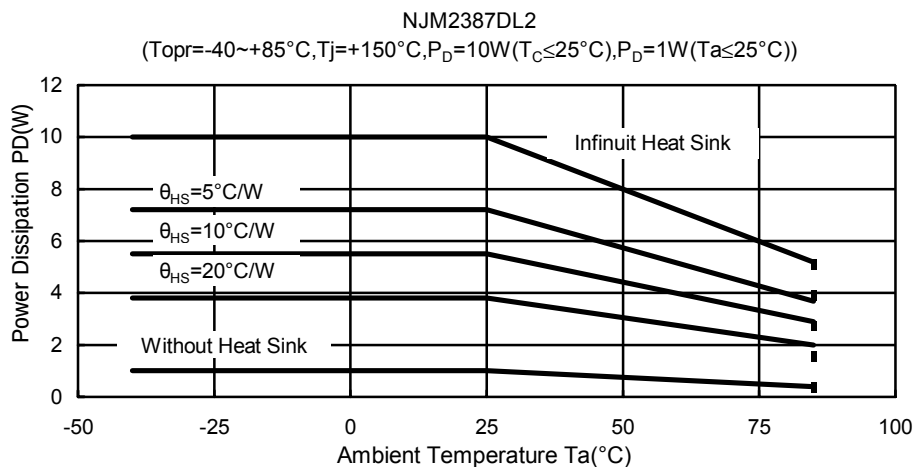
■ ELECTRICAL CHARACTERISTICS ($V_{IN}=15\text{V}$, $V_O=10\text{V}$, $I_O=0.5\text{A}$, $R_1=1\text{k}\Omega$, $C_{IN}=0.33\mu\text{F}$, $C_O=22\mu\text{F}$, $T_a=25^\circ\text{C}$)

Measurement is to be conducted is pulse testing.

PARAMETER	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Input Voltage	V_{IN}	-	3.8	-	35	V
Output Voltage	V_{OUT}	-	1.5	-	20	V
Reference Voltage	V_{ref}	-	1.235	1.26	1.285	V
Line Regulation	$\Delta V_O / \Delta V_{IN}$	$V_{IN}=V_O+1\text{V} \sim V_O+17\text{V}$	-	0.04	0.16	%/V
Load Regulation	$\Delta V_O / \Delta I_O$	$V_{IN}=V_O+2\text{V}, I_O=0\text{A} \sim 1.0\text{A}$	-	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	$I_O=0\text{A}$	-	-	5	mA
Dropout Voltage	ΔV_{LO}	$I_O=0.5\text{A}$	-	0.2	0.5	V
Ripple Rejection	RR	$V_{in}=V_O+2\text{V}$, $e_{in}=0.5\text{Vrms}$ $e_{in}=0.5\text{Vrms}$, $f=120\text{Hz}$	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	$I_{CONT(ON)}$	$V_C=2.7\text{V}$	-	-	20	μA
OFF Control Current	$I_{CONT(OFF)}$	$V_C=0.4\text{V}$	-	-	-20	μA

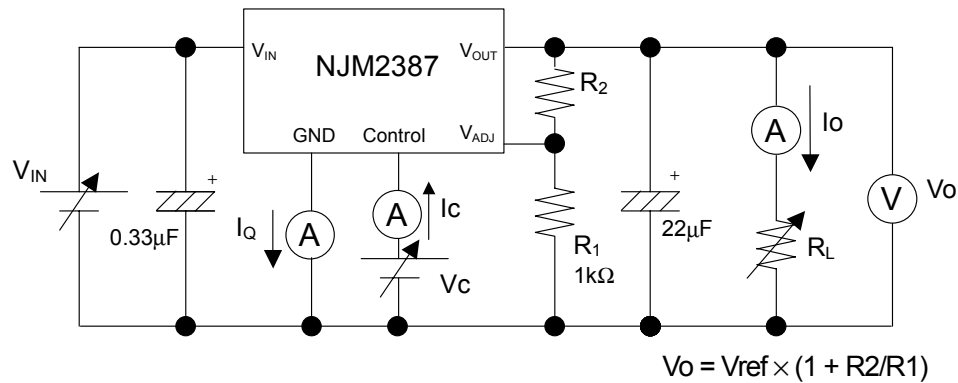
(*2): When ON/OFF CONTROL Terminal is open, Output Voltage is ON.

■ POWER DISSIPATION vs. AMBIENT TEMPERATURE



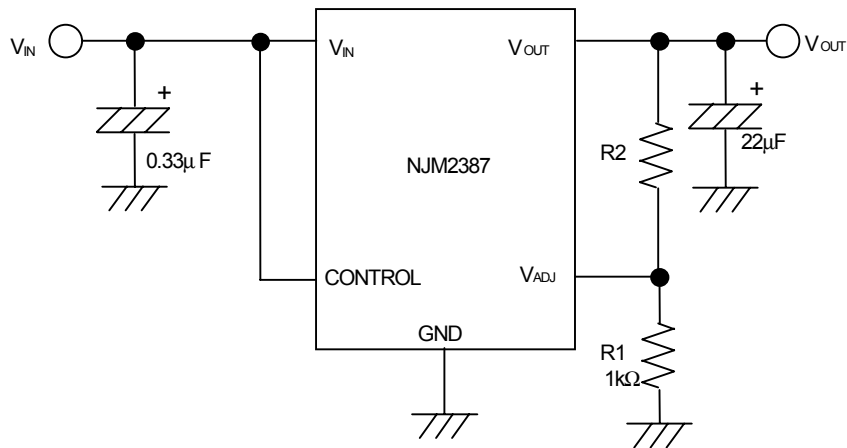
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■ TEST CIRCUIT



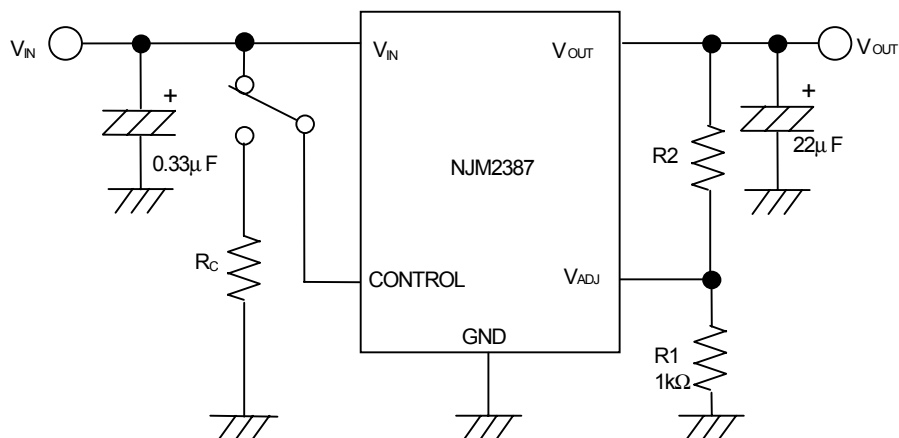
■ TYPICAL APPLICATION

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.

NJM2387/89

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■ NJM2389

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

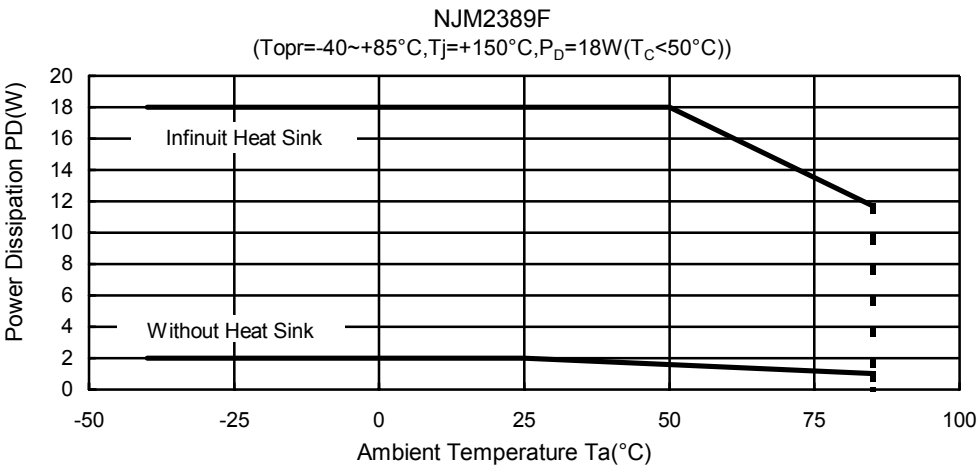
Measurement is to be conducted is pulse testing.

PARAMETER	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Input Voltage	V_{IN}	-	3.8	-	35	V
Output Voltage	V_{OUT}	-	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	$\Delta V_O/\Delta T$	$T_J=0 \sim +125^\circ C$	-	± 0.02	-	%/°C
Quiescent Current	I_Q	$I_O=0A$	-	-	5	mA
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

■ THERMAL CHARACTERISTICS

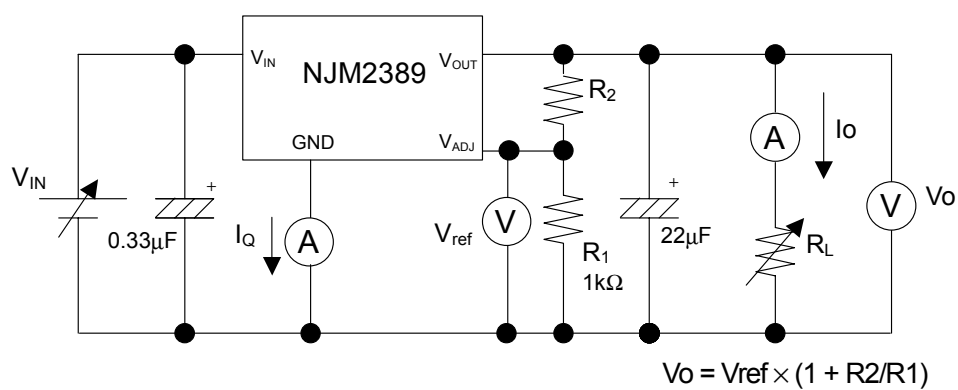
Thermal Resistance	Junction-to-Ambient Temperature	θ_{ja}	60	°C/W
	Junction to case	θ_{jc}	5	

■ POWER DISSIPATION vs. AMBIENT TEMPERATURE

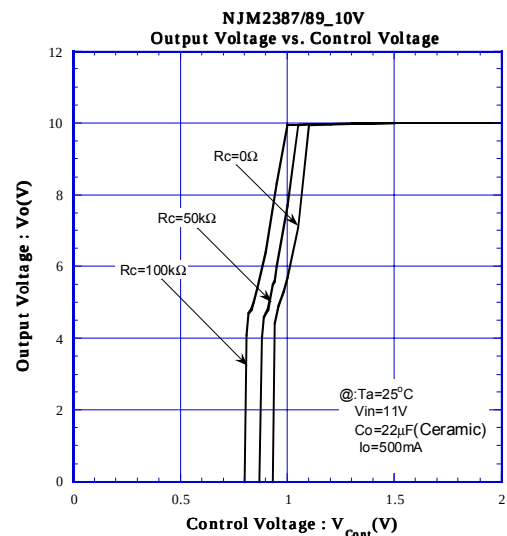
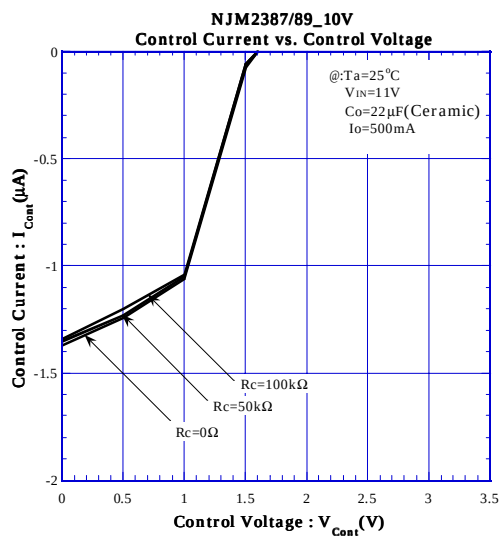
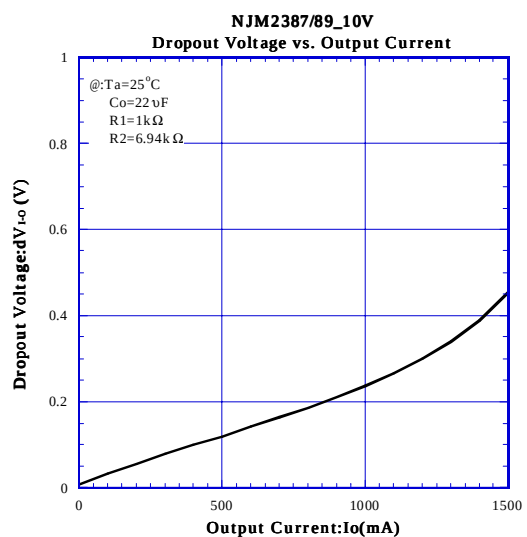
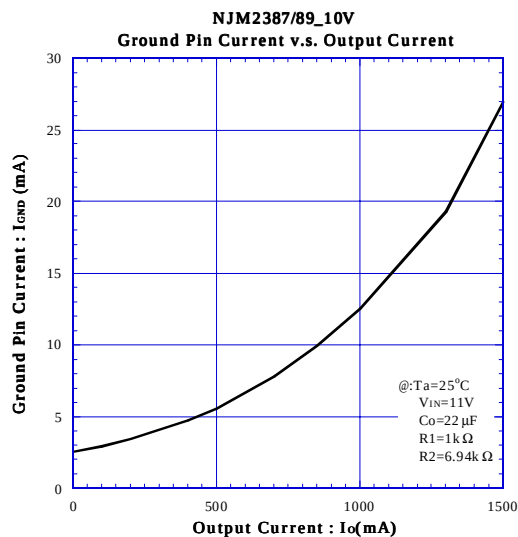
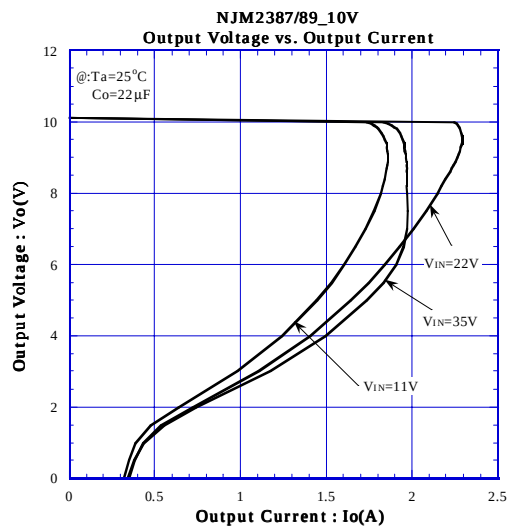
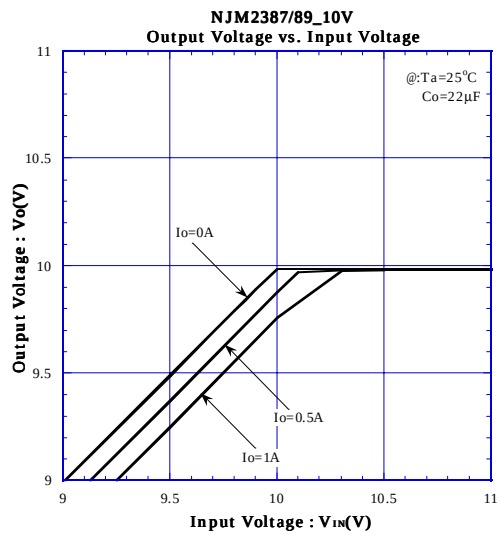


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■ TEST CIRCUIT

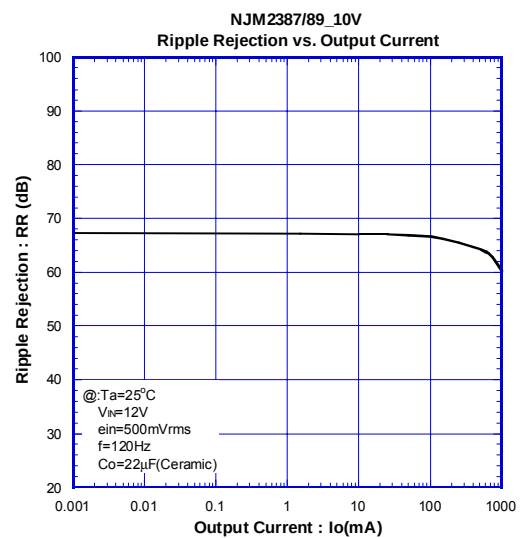
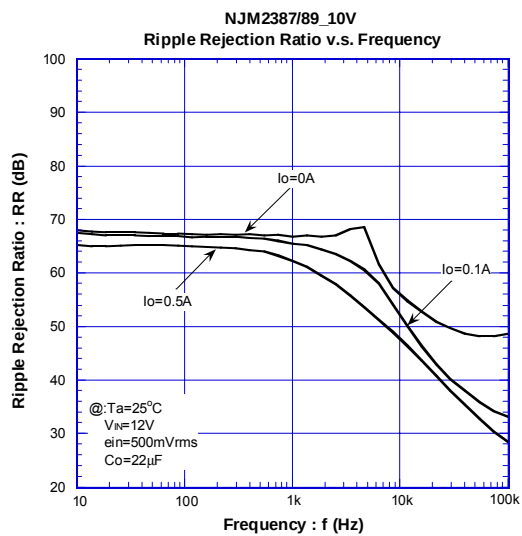
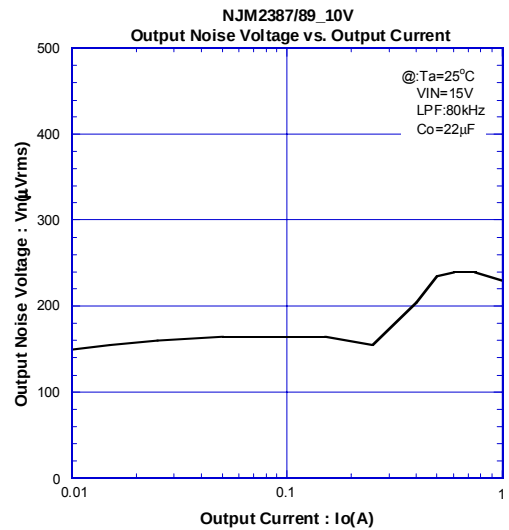
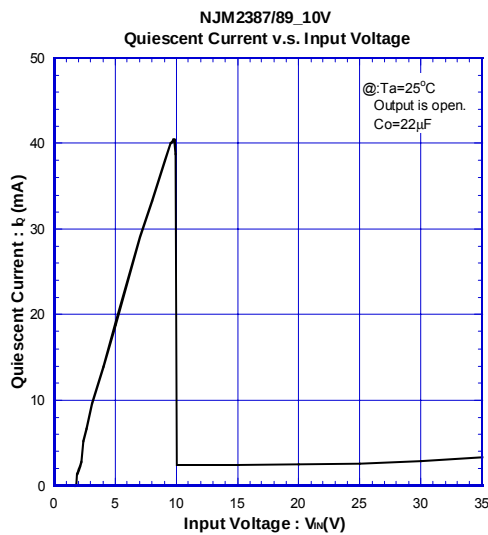
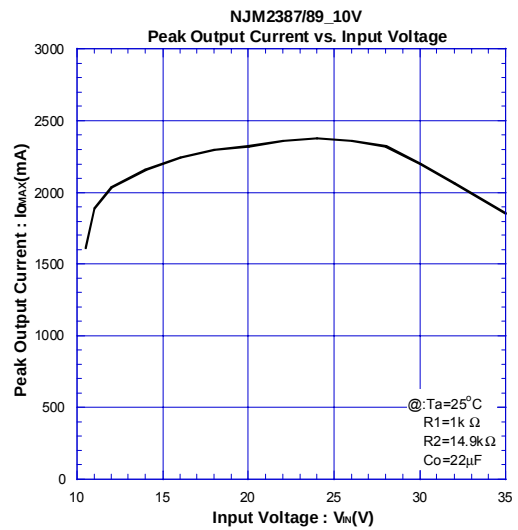
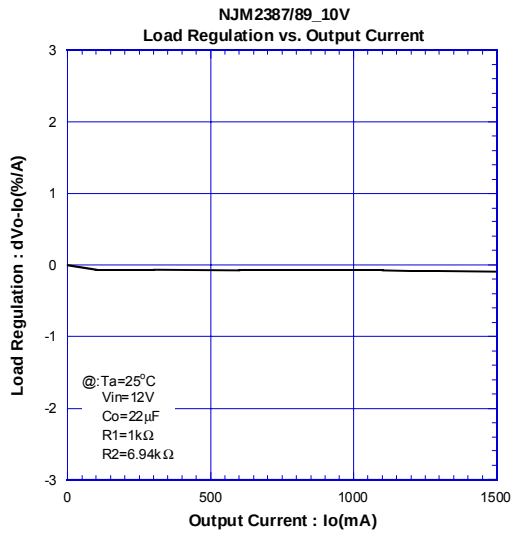


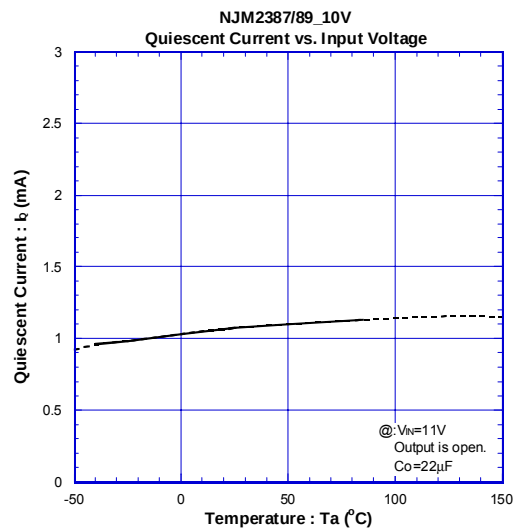
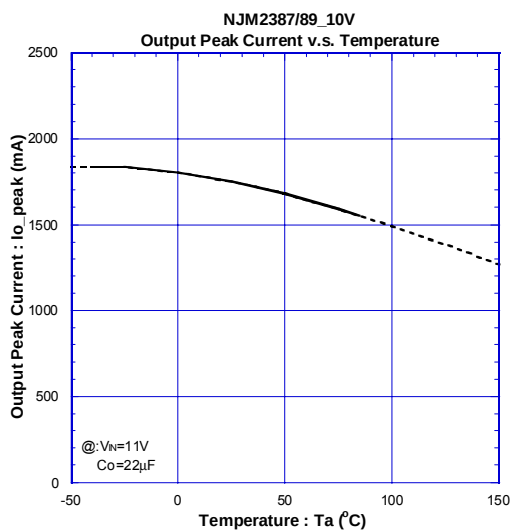
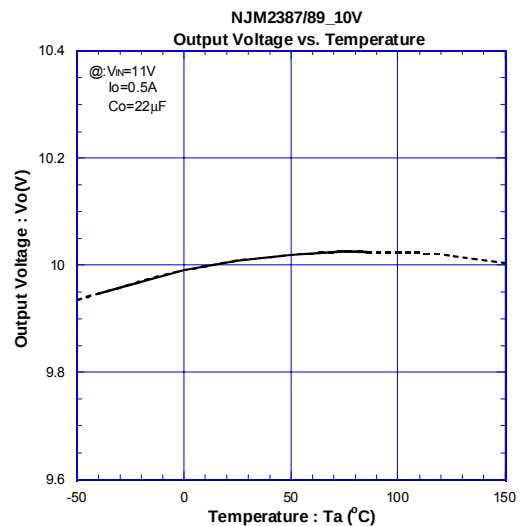
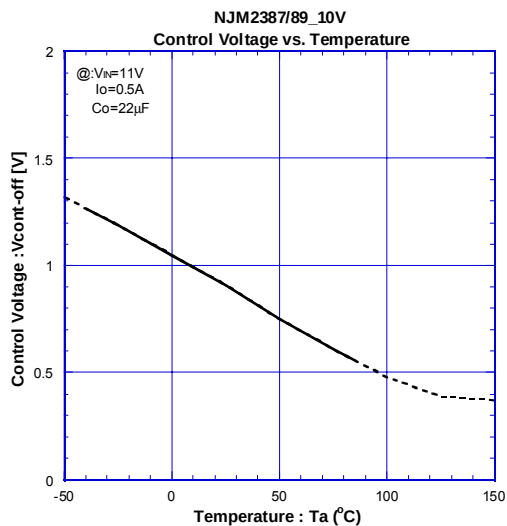
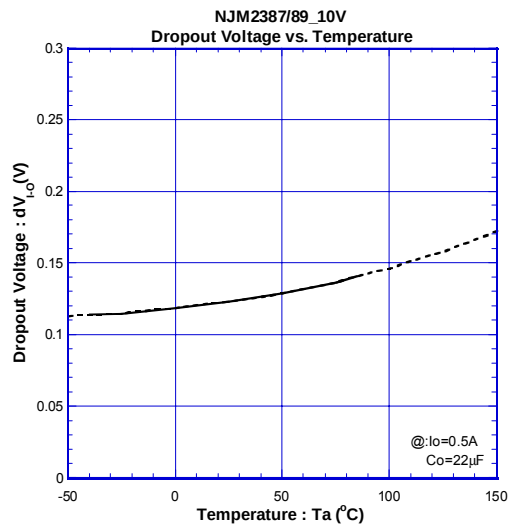
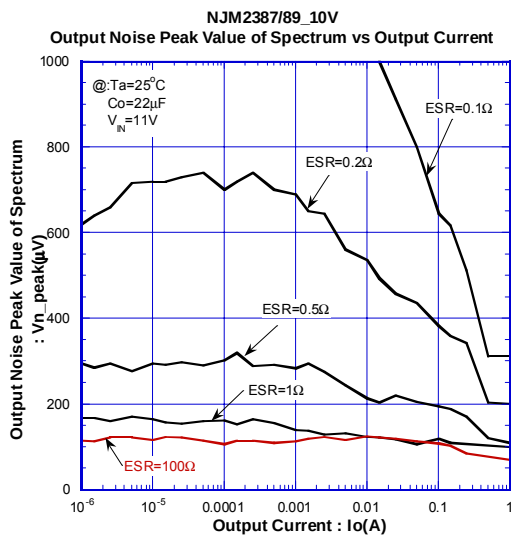
■ TYPICAL CHARACTERISTICS



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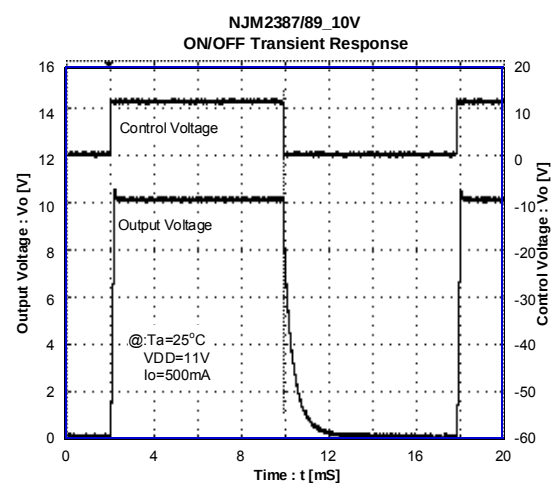
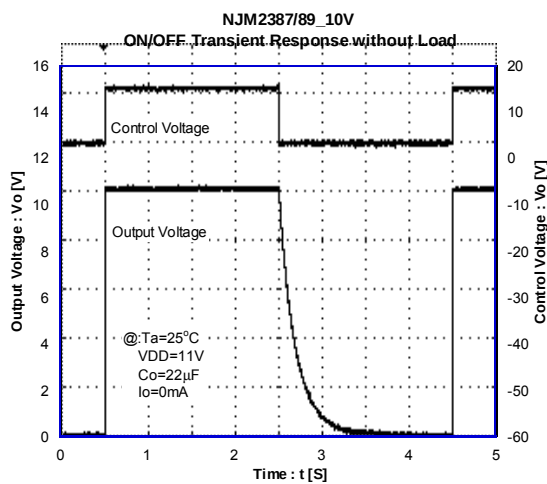
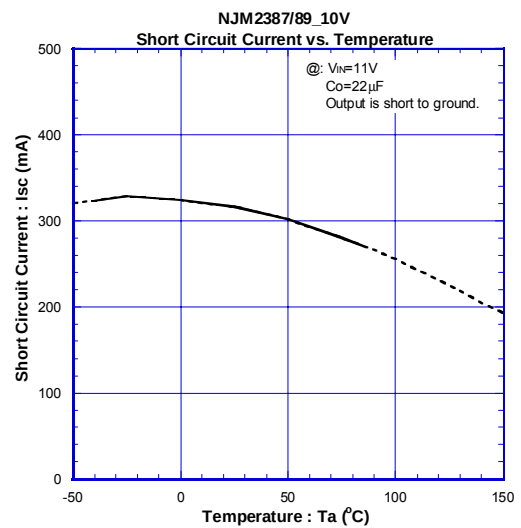
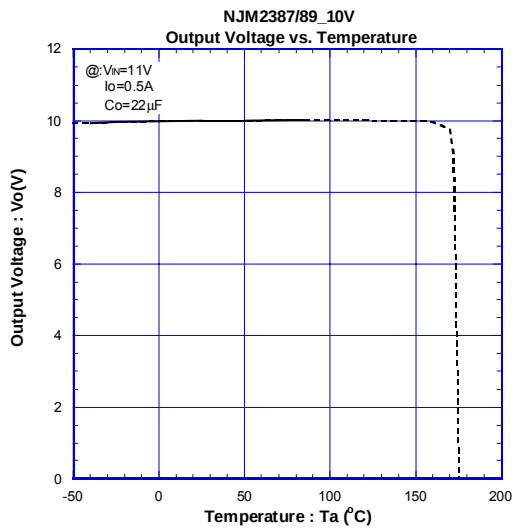
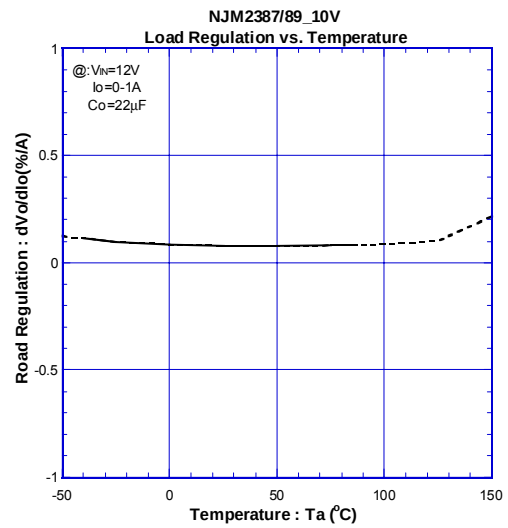
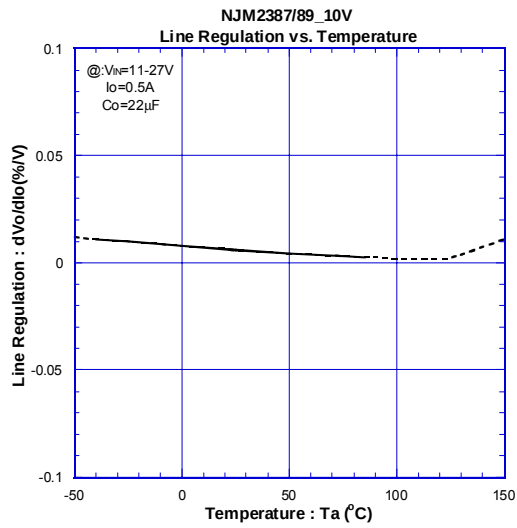
■ TYPICAL CHARACTERISTICS





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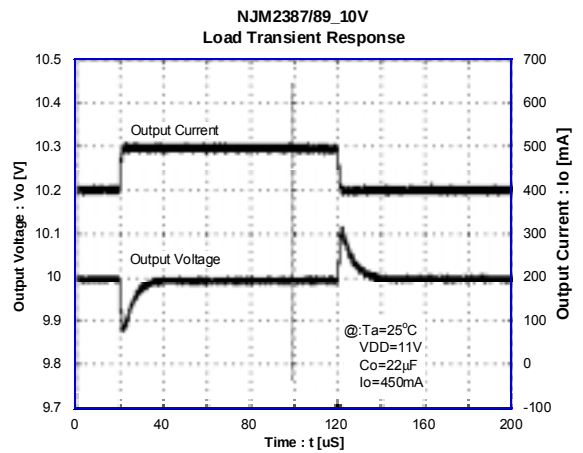
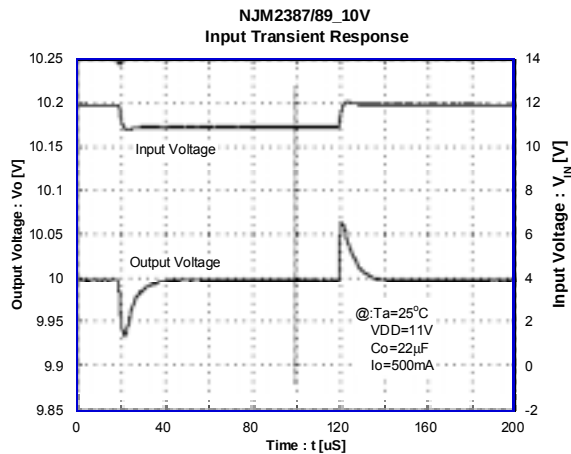
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