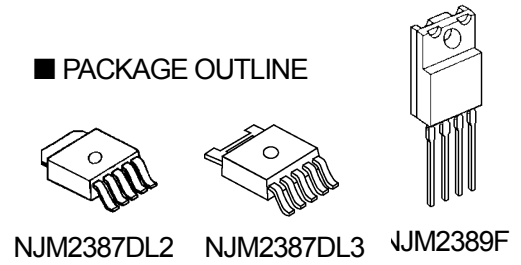


ADJUSTABLE LOW DROPOUT VOLTAGE REGULATOR

■ 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.

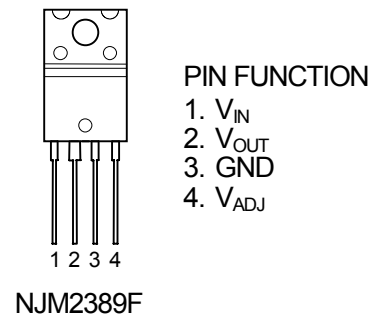
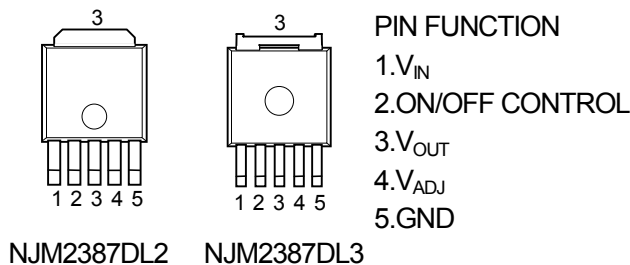
■ PACKAGE OUTLINE



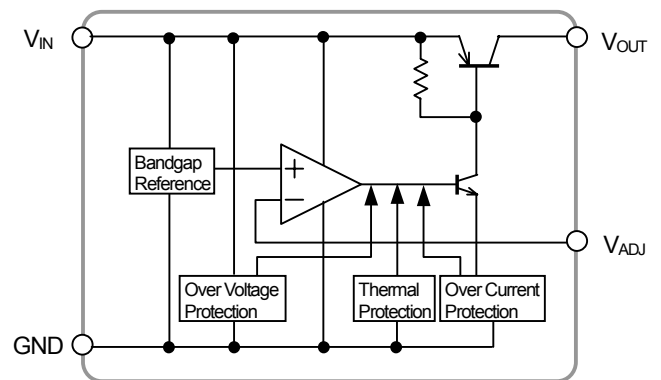
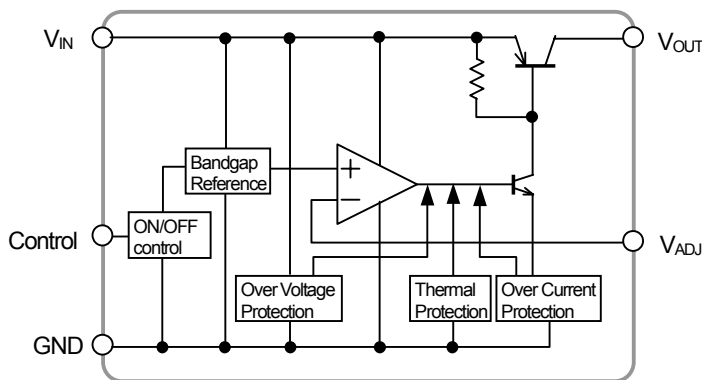
■ FEATURE

- 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 ≤25°C) / 1(T _a ≤25°C)	W
		NJM2389	18(T _C <50°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}=15V, V_O=10V, I_O=0.5A, R₁=1kΩ, C_{IN}=0.33μF, C_O=22μF, Ta=25°C)

Measurement is to be conducted is pulse testing.

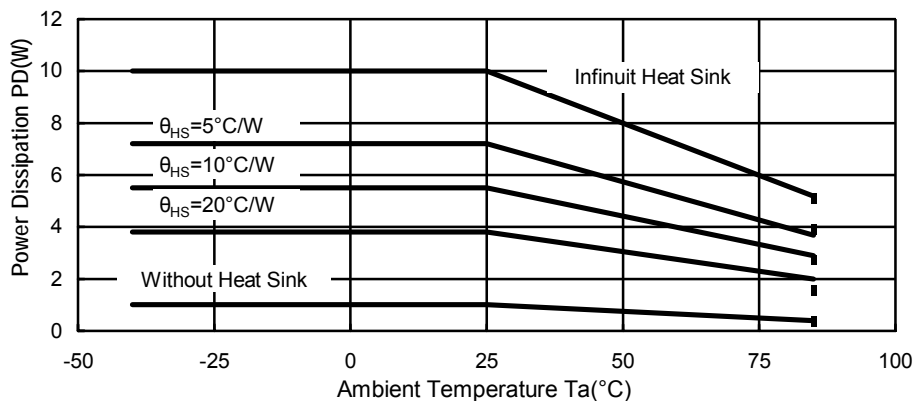
PARAMETER	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Input Voltage	V _{IN}	-	3.8	-	35	V
Output Voltage	V _{OUT}	-	1.5	-	20	V
Reference Voltage	V _{ref}	-	1.235	1.26	1.285	V
Line Regulation	ΔV _O /ΔV _{IN}	V _{IN} =V _O +1V ~ V _O +17V	-	0.04	0.16	%/V
Load Regulation	ΔV _O /ΔI _O	V _{IN} =V _O +2V, I _O =0A ~ 1.0A	-	0.2	1.4	%/A
Average Temperature Coefficient of Output Voltage	ΔV _O /ΔT	T _J =0 ~ +125°C	-	±0.02	-	%/°C
Quiescent Current	I _Q	I _O =0A	-	-	5	mA
Dropout Voltage	ΔV _{LO}	I _O =0.5A	-	0.2	0.5	V
Ripple Rejection	RR	V _{in} =V _O +2V, e _{in} =0.5Vrms e _{in} =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	-	-	20	μA
OFF Control Current	I _{CONT(OFF)}	V _C =0.4V	-	-	-20	μA

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

■ POWER DISSIPATION vs. AMBIENT TEMPERATURE

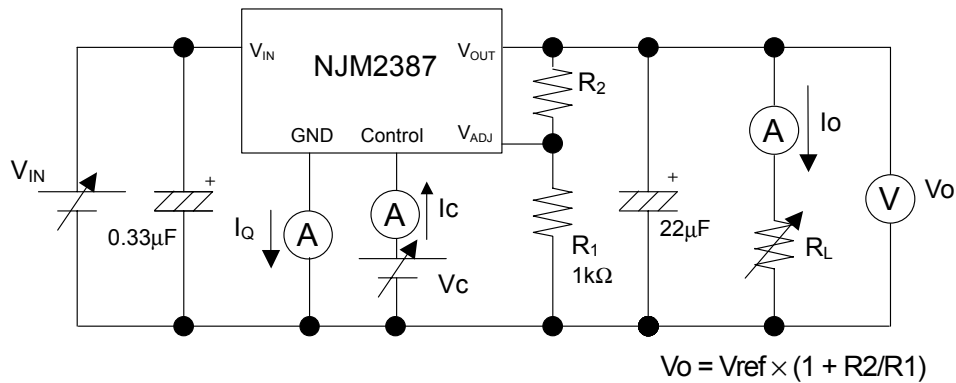
NJM2387DL2

(T_{opr}=-40~+85°C, T_J=+150°C, P_D=10W(T_C≤25°C), P_D=1W(T_a≤25°C))



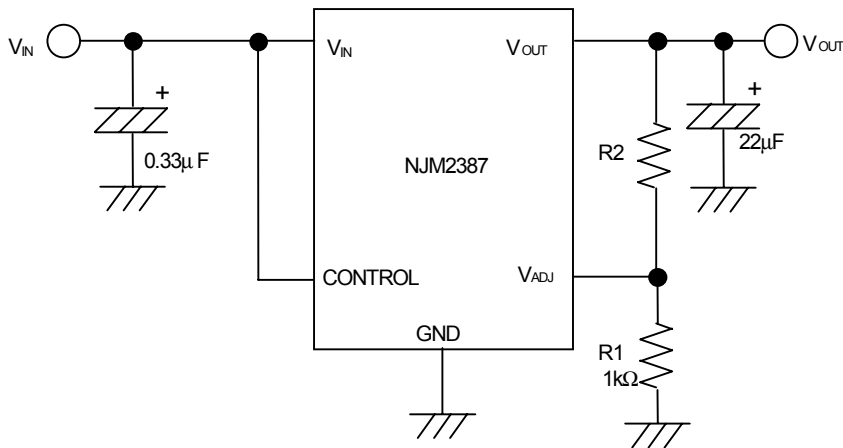
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■ TEST CIRCUIT



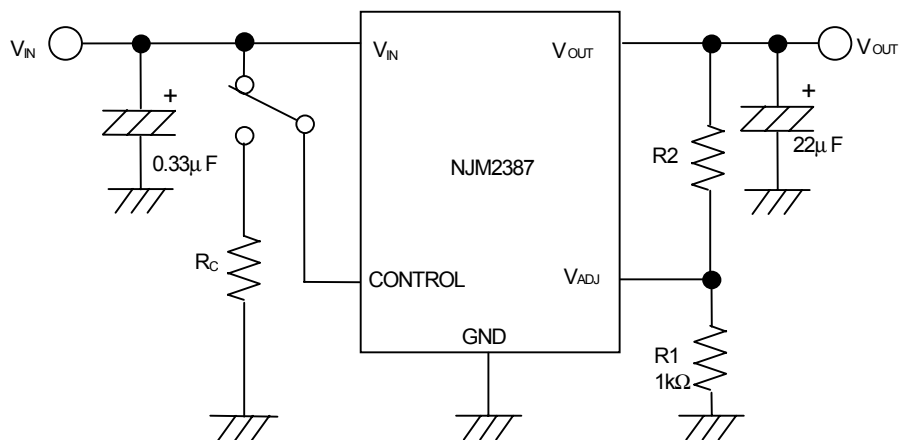
■ TYPICAL APPLICATION

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

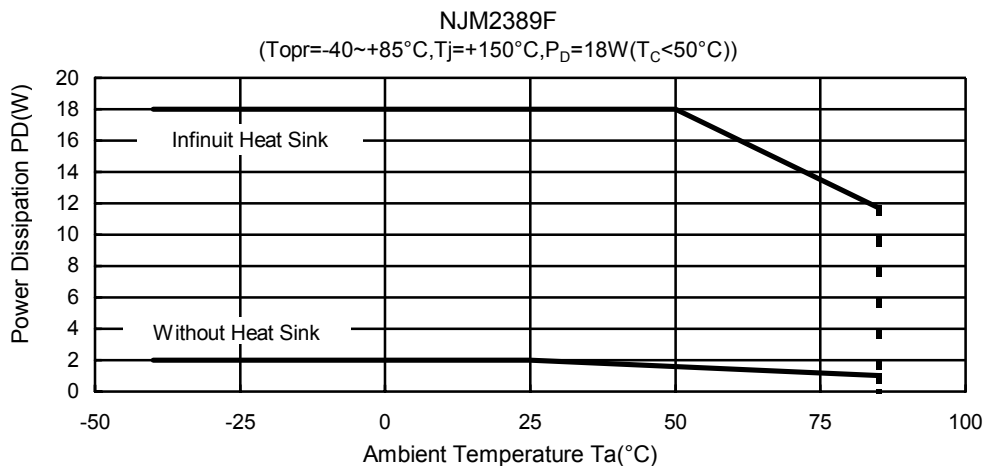
Measurement is to be conducted is pulse testing.

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_{L_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

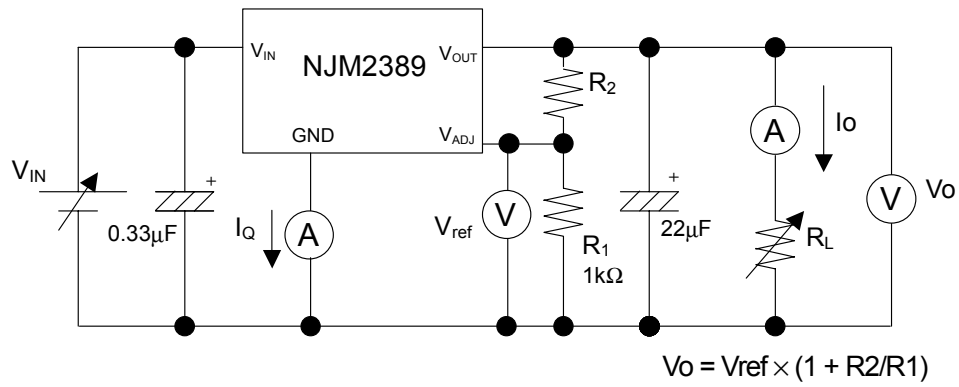
Thermal Resistance	Junction-to-Ambient Temperature	θ_{ja}	60	°C/W
	Junction to case	θ_{jc}	5	

■ POWER DISSIPATION vs. AMBIENT TEMPERATURE



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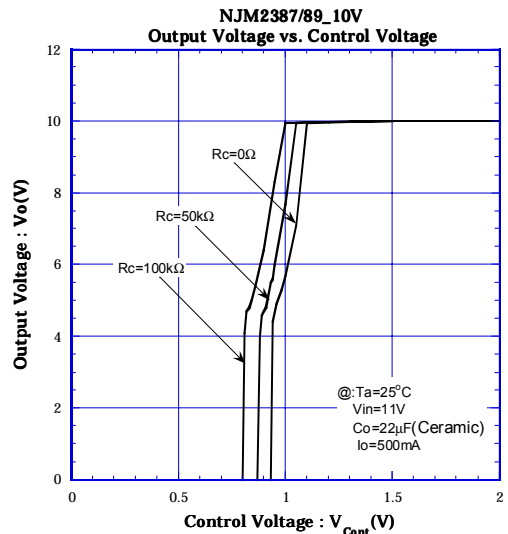
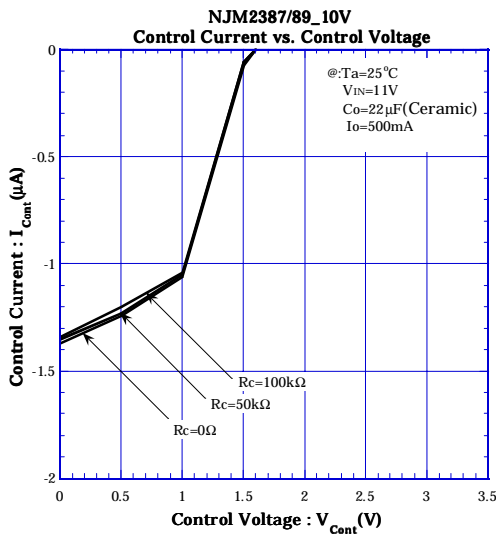
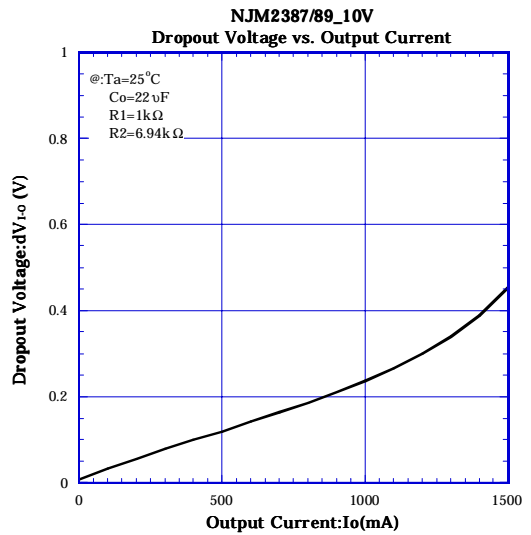
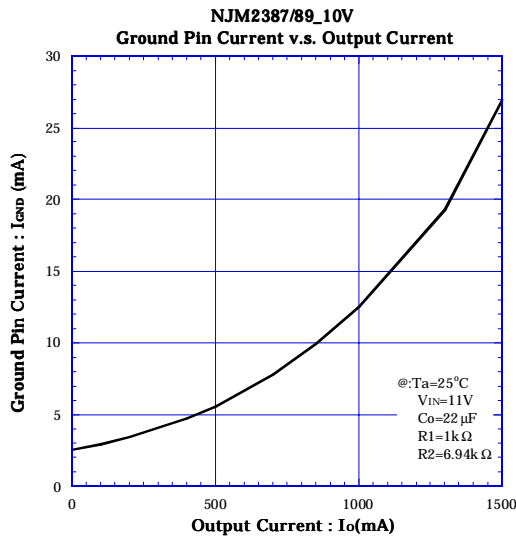
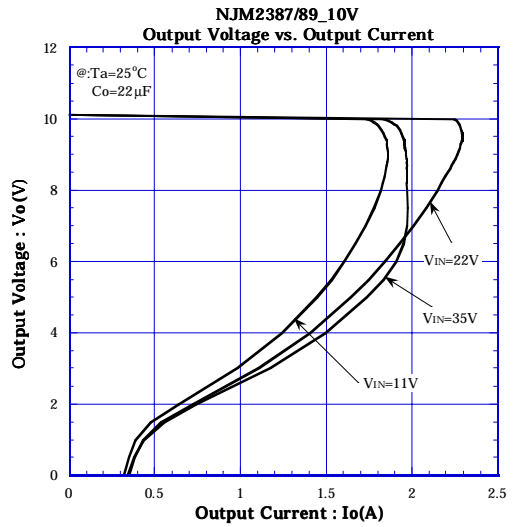
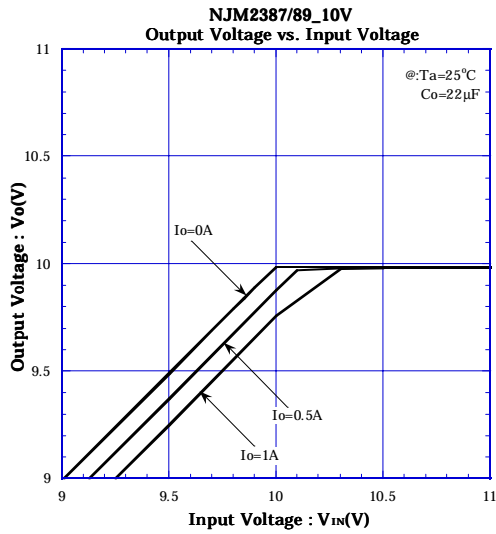
■ TEST CIRCUIT



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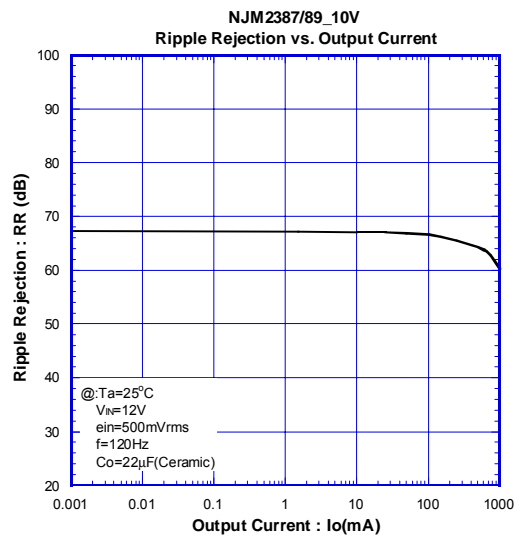
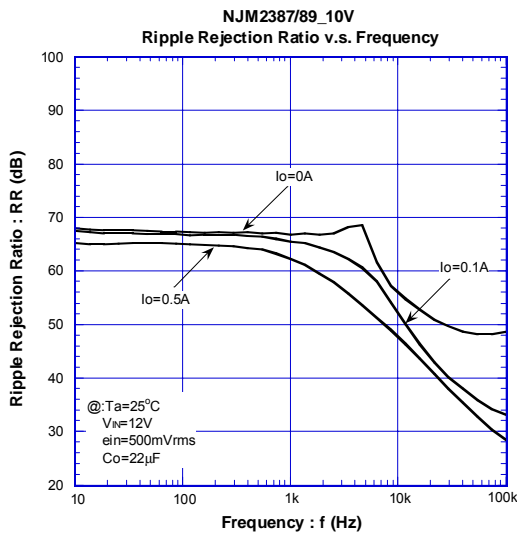
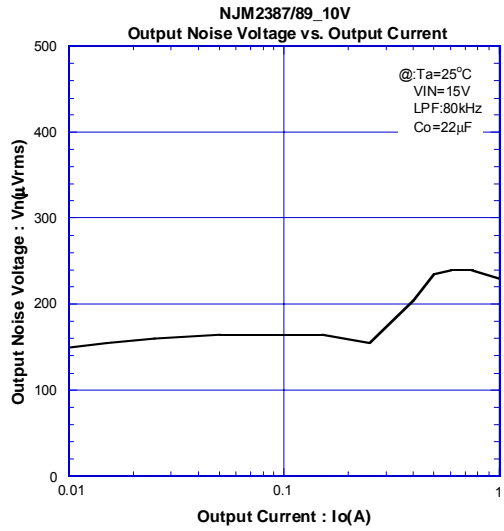
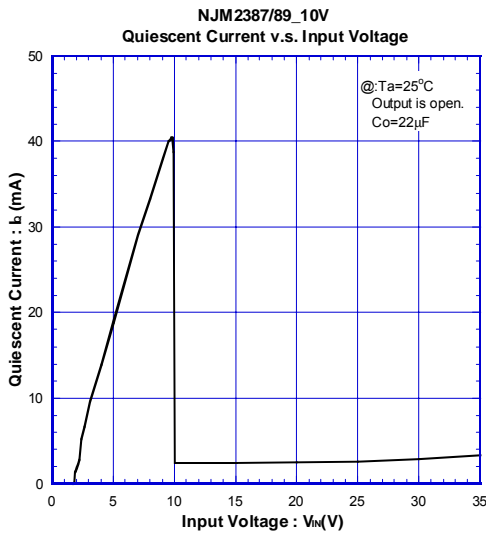
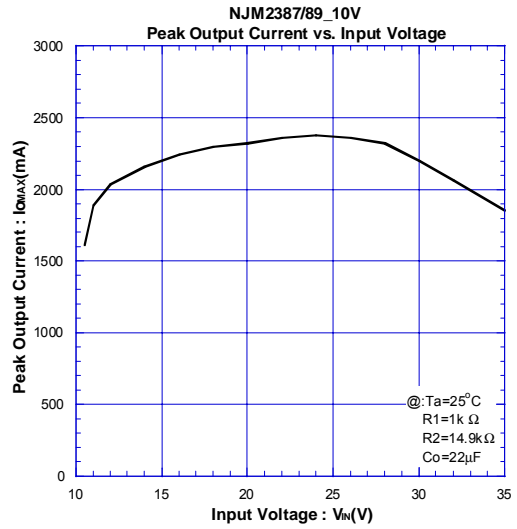
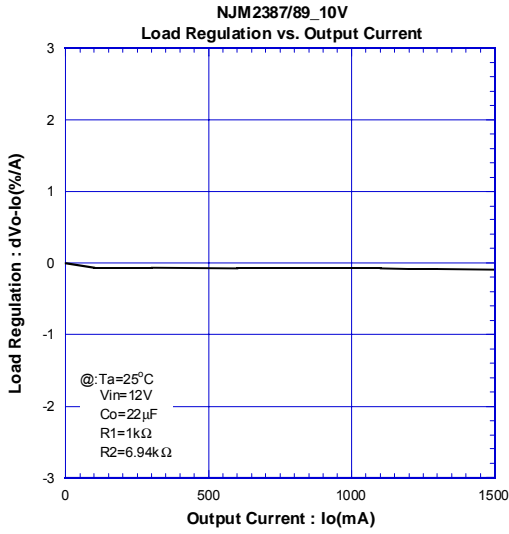
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■ TYPICAL CHARACTERISTICS



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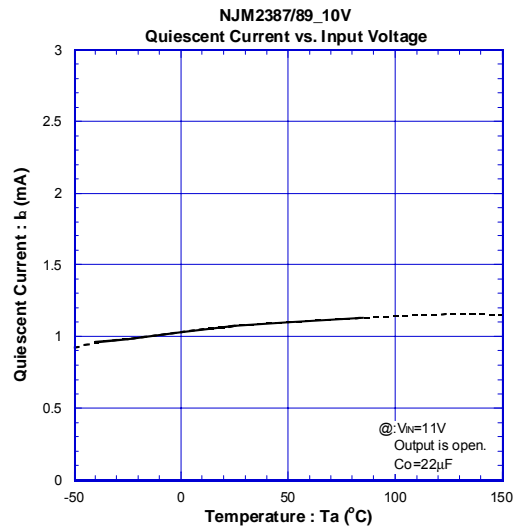
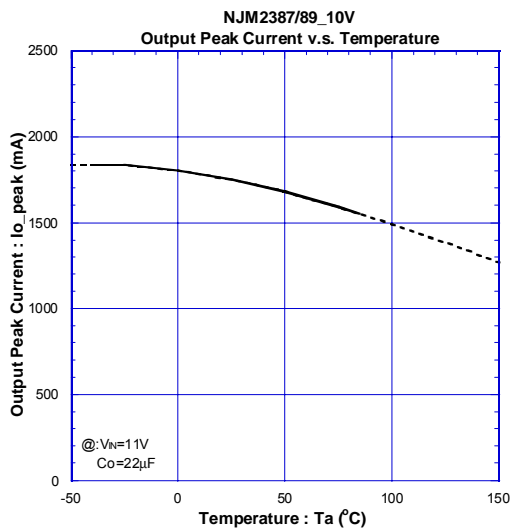
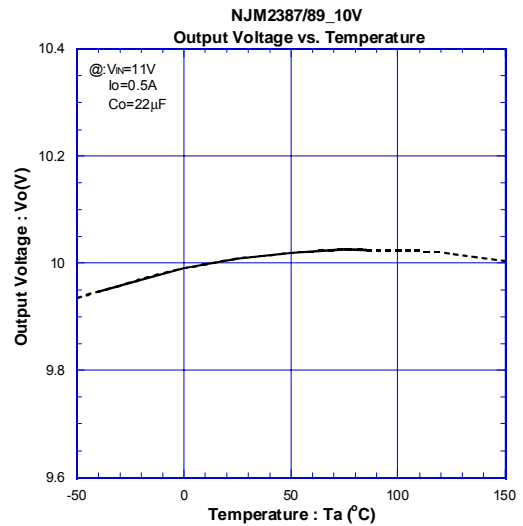
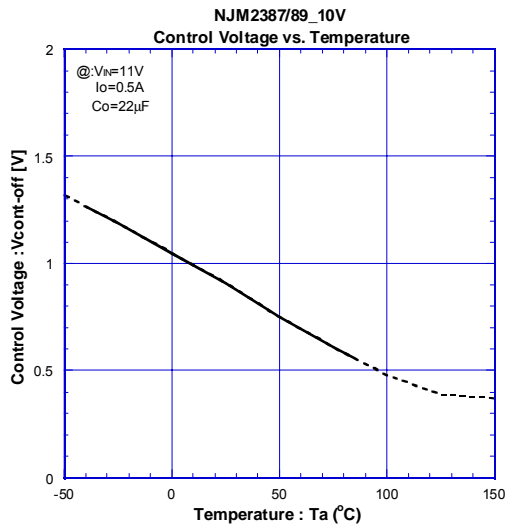
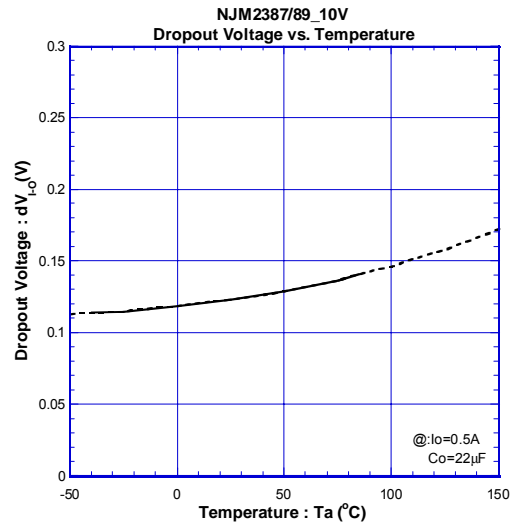
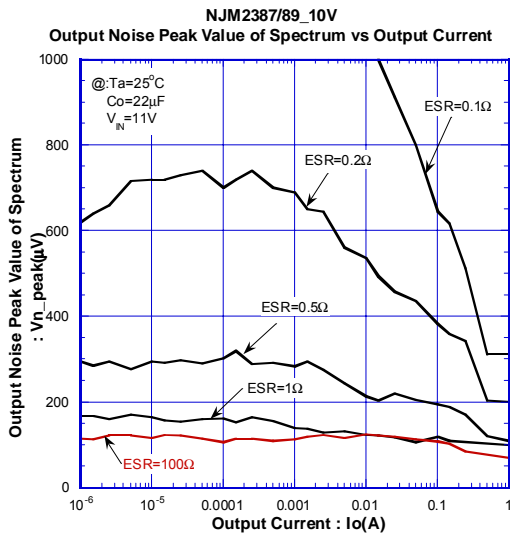
TYPICAL CHARACTERISTICS



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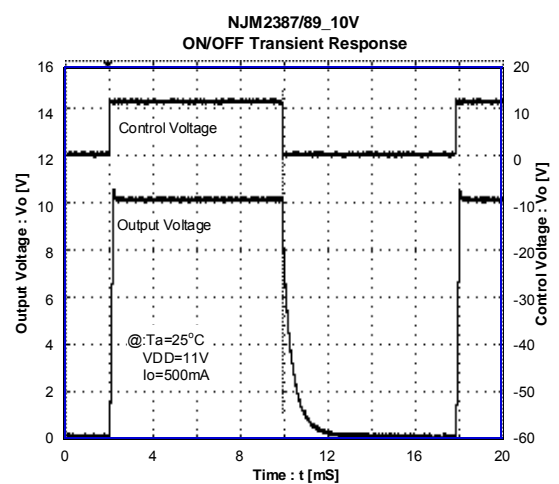
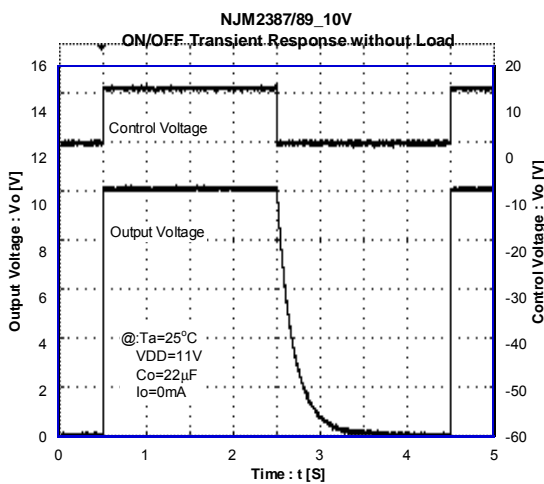
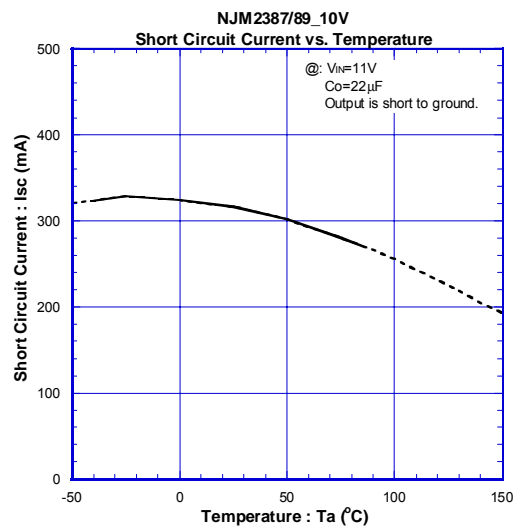
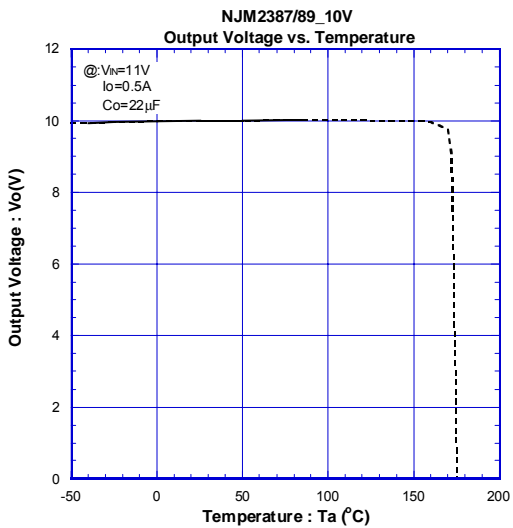
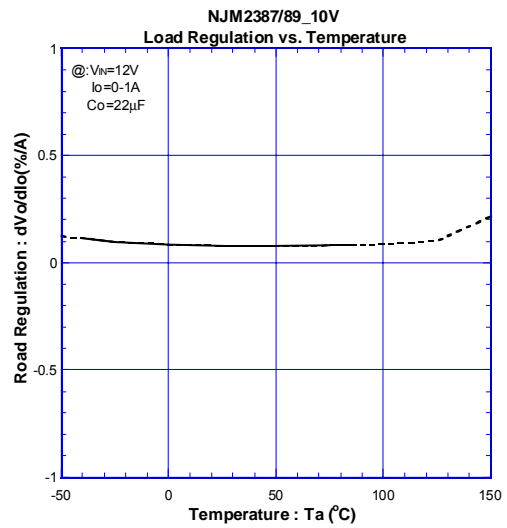
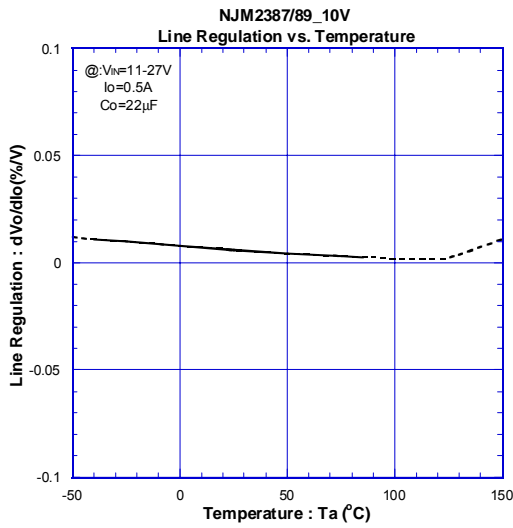
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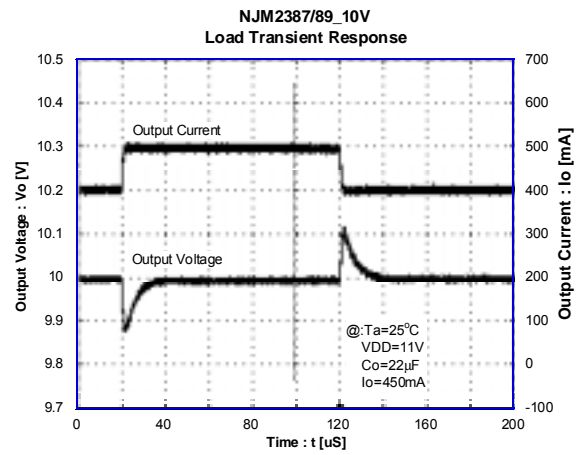
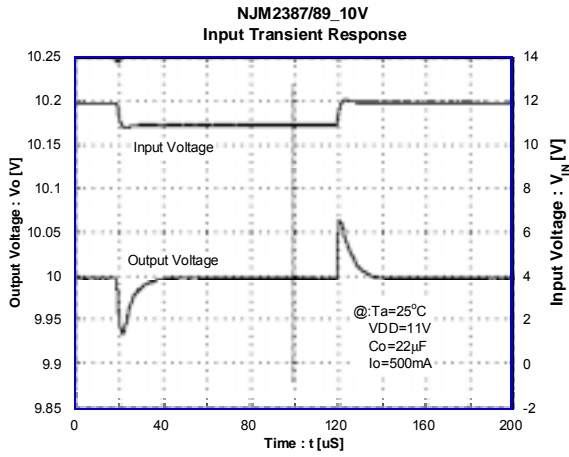
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