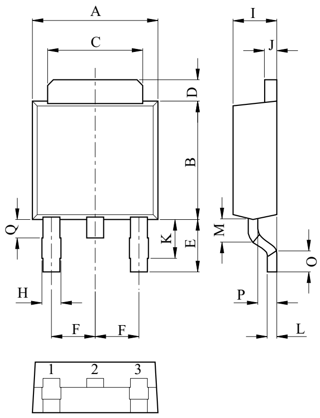
KIA78D15AF~ KIA78D05AF

SEMICONDUCTOR
TECHNICAL DATA

BIPOLAR LINEAR INTEGRATED CIRCUIT

3 TERMINAL LOW DROP OUTPUT VOLTAGE REGULATOR



DIM	MILLIMETERS
A	6.60±0.2
B	6.10±0.2
C	5.0±0.2
D	1.10±0.2
E	2.70±0.2
F	2.30±0.1
H	1.00 MAX
I	2.30±0.2
J	0.50±0.1
K	2.00±0.20
L	0.50±0.10
M	0.91±0.10
O	0.90±0.1
P	1.00±0.10
Q	0.95 MAX

1. V_{IN}
2. GND
3. V_{OUT}

DPAK

Description

The KIA78DxxAF Series are Low Dropout Voltage Regulator suitable for various electronic equipments.

The Regulator has multi function such as over current protection, overheat protection.

Features

- 1.0A Output Low Drop Voltage Regulator.
- Built in Over Current Protection, Over Heat Protection.
- Low Quiescent Current : 2mA(Typ.)

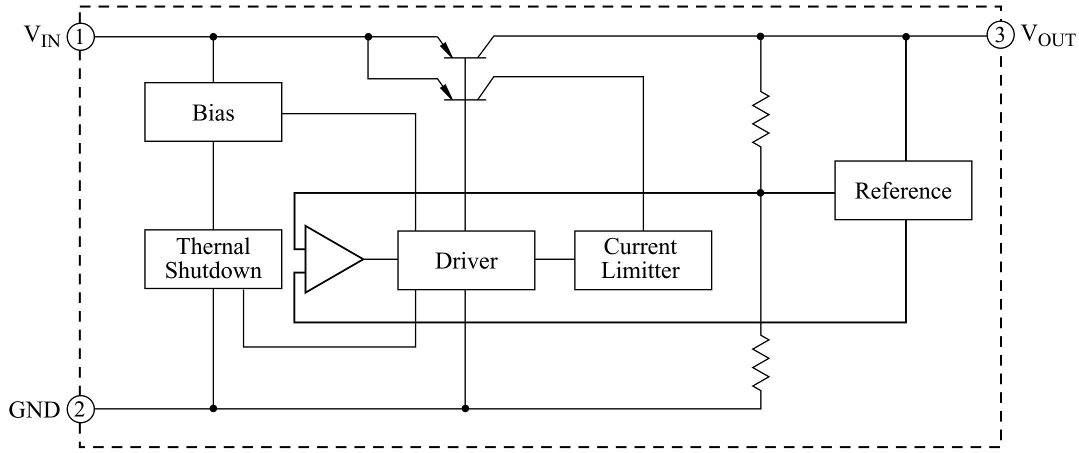
LINE UP

ITEM	OUTPUT VOLTAGE (Typ.)	PACKAGE
KIA78D15AF	1.5V	F : DPAK
KIA78D18AF	1.8V	
KIA78D20AF	2.0V	
KIA78D25AF	2.5V	
KIA78D30AF	3.0V	
KIA78D33AF	3.3V	
KIA78D35AF	3.5V	
KIA78D05AF	5.0V	

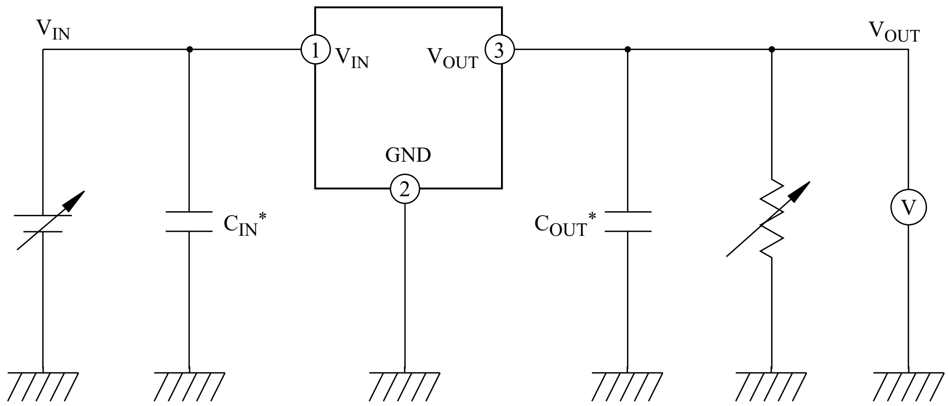
MAXIMUM RATINGS (Ta=25℃)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Input Voltage	V_{IN}	15	V
Output Current	I_O	1	A
Power Dissipation -1 (No Heatsink)	P_{D1}	1.0	W
Power Dissipation -2 (Infinite Heatsink)	P_{D2}	10	
Junction Temperature	T_j	150	℃
Operating Temperature	T_{opr}	-40 ~ +85	℃
Storage Temperature	T_{stg}	-50 ~ +150	℃

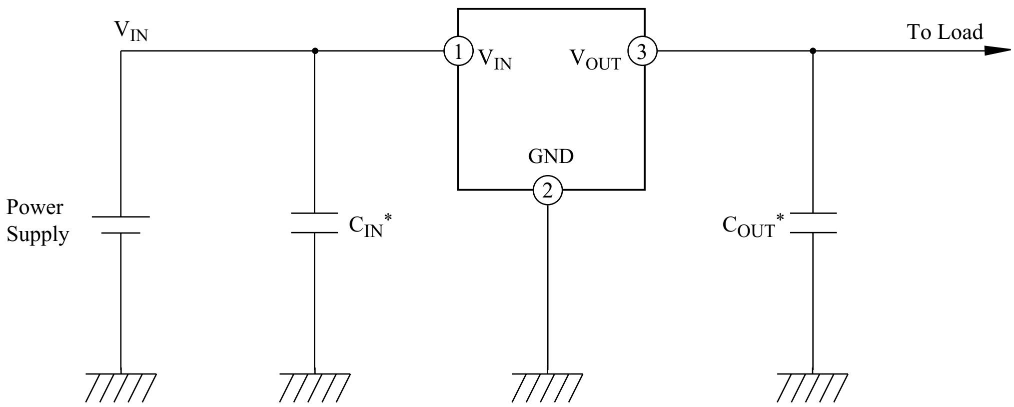
Block Diagram



Test Circuit



Application Circuit



* Input capacitor (C_{IN}) , Output capacitor (C_{OUT}) : more than 1.0uF (ceramic capacitor).
When mounting an output capacitor (C_{OUT}) between the V_{OUT} and GND pin and Input capacitor (C_{IN}) for stabilizing the input between the V_{IN} and GND pin , the distance from the capacitors to these pins should be as short as possible.

Electrical Characteristics

(V_{IN} = V_{OUT}(typ.)+2V for V_{OUT} 2.0V, V_{IN} = 2.5V for V_{OUT} ≤ 2.0V, Ta = 25℃, C_{IN} = C_{OUT} = 1 μF, unless otherwise specified.)

CHARACTERISTIC	SYMBOL	Test Conditions	Min.	Typ.	Max.	Units
Quiescent Current	I_B	I_{OUT} = 0mA	-	2	5	mA
Output Voltage	V_{OUT}	I_{OUT} = 1mA	×0.98	-	×1.02	V
Dropout Voltage *	V_D	V_{IN} = 0.95 × V_{OUT}, I_{OUT} = 500mA	-	0.25	0.5	V
Line Regulation	Reg Line	V_{OUT}(typ.)+1.5V≤V_{DD}≤V_{OUT}(typ.)+ 2.5V, I_{OUT} = 1mA	-	0.05	0.1	%/V
Load Regulation	Reg Load	1mA≤I_{OUT}≤1000mA	-	20	100	mV
V_{OUT} Temperature Coefficient	$\Delta V_{OUT}/\Delta T$	I_{OUT} = 1mA, -40℃≤Top≤85℃	-	100	-	ppm/℃
Ripple Rejection	R · R	f=1kHz, Vripple=1.0V, I_{OUT} = 10mA	-	70	-	dB
Output Noise Voltage	V_{NO}	fBW=20~80kHz, I_{OUT} = 10mA	-	100	-	μVrms

* Dropout Voltage is not guaranteed in the model less than Vout=2.0V

Typical Characteristics (Ta=25℃, C_{IN}=C_{OUT}=1 μF, , unless otherwise specified.)

Fig. 1-1 Input Voltage vs. Output Voltage
(KIA78D15AF)

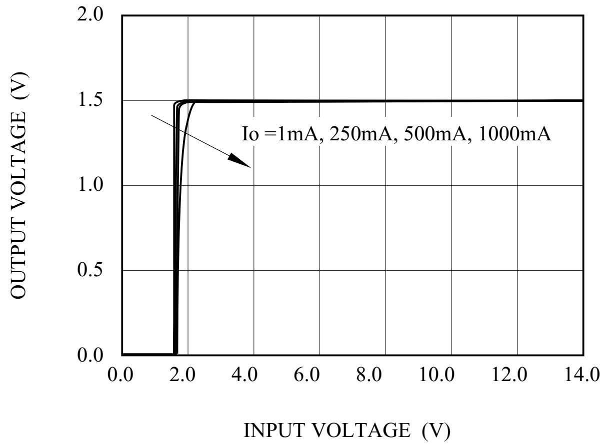


Fig. 1-2 Input Voltage vs. Output Voltage
(KIA78D33AF)

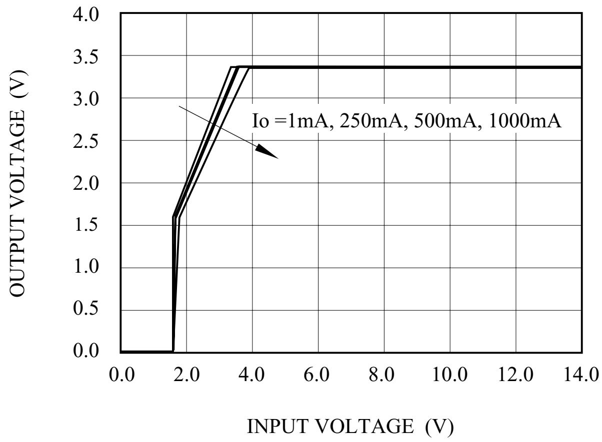


Fig. 1-3 Input Voltage vs. Output Voltage
(KIA78D05AF)

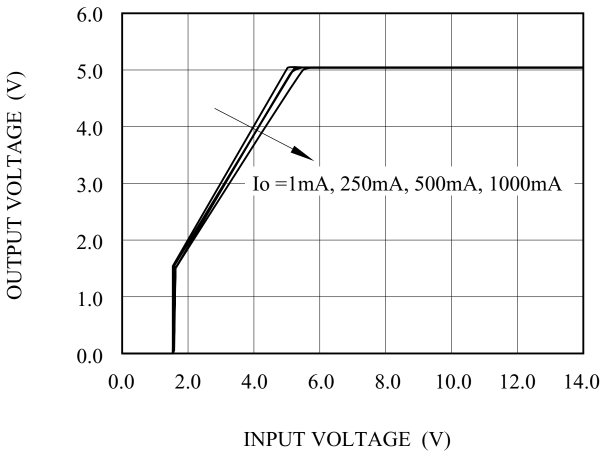


Fig. 2-1 Input Voltage vs. Input Current
(KIA78D15AF)

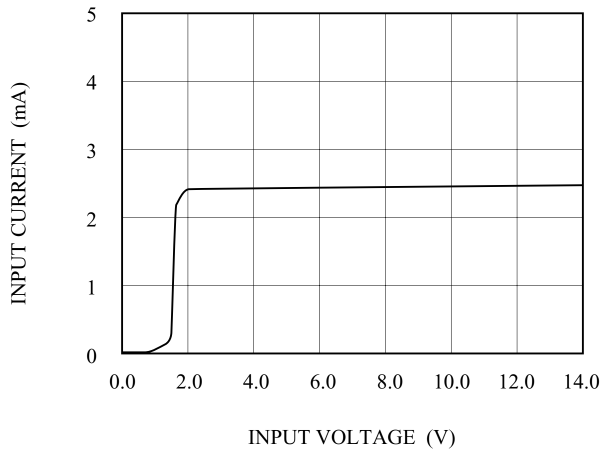


Fig. 2-2 Input Voltage vs. Input Current
(KIA78D33AF)

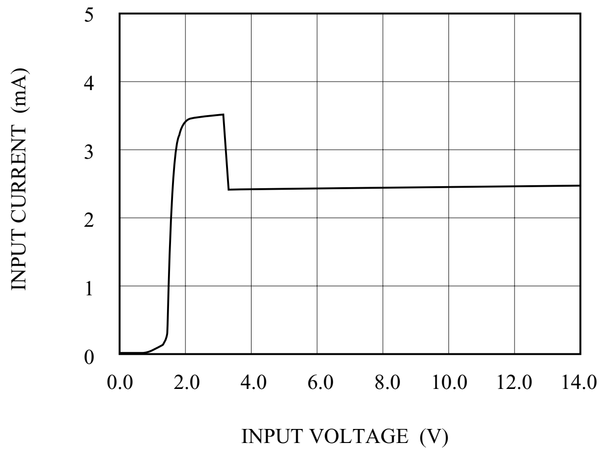
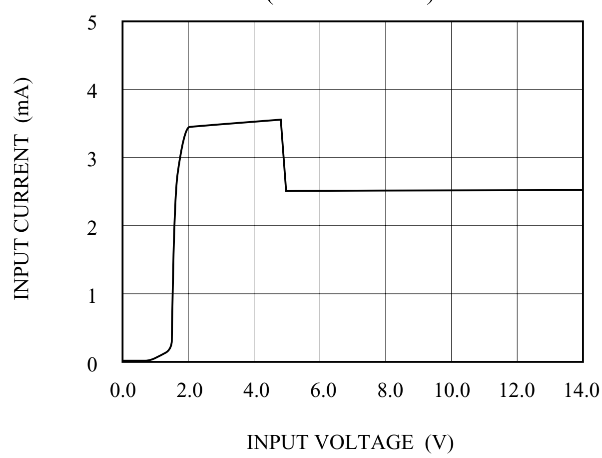


Fig. 2-3 Input Voltage vs. Input Current
(KIA78D05AF)



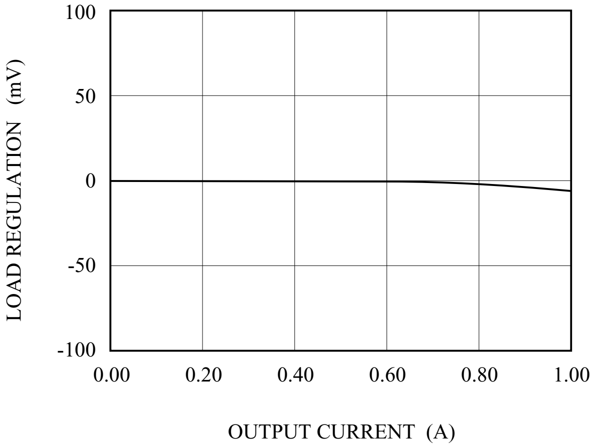


Fig.3-1 LOAD REGULATION (KIA78D15AF)

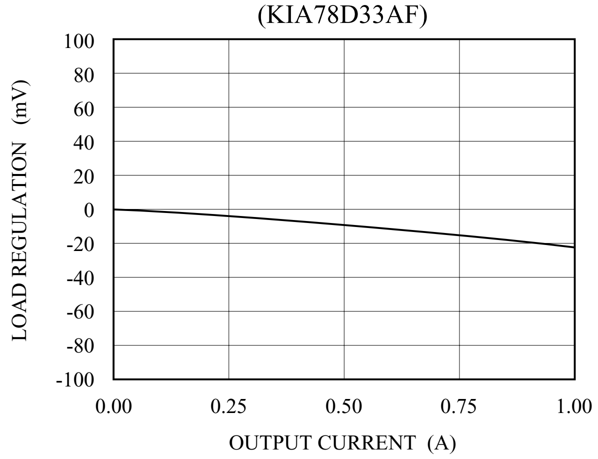


Fig.3-2 LOAD REGULATION (KIA78D33AF)

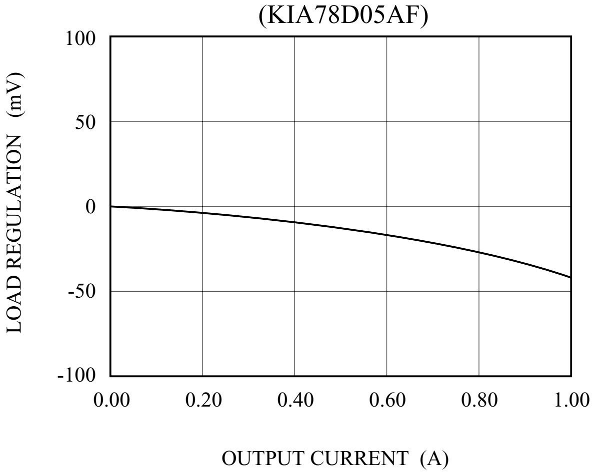


Fig.3-3 LOAD REGULATION (KIA78D05AF)

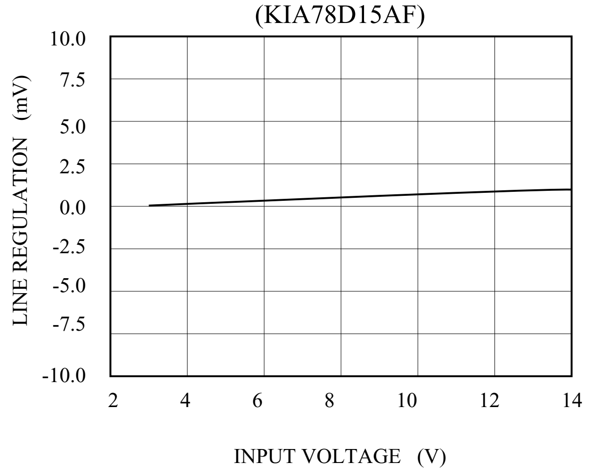


Fig.4-1 LINE REGULATION (KIA78D15AF)

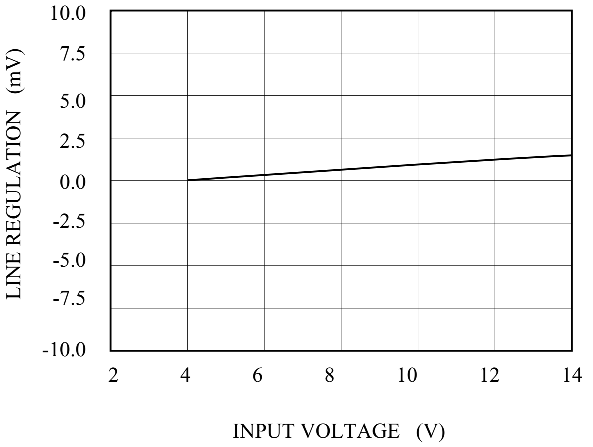


Fig.4-2 LINE REGULATION (KIA78D33AF)

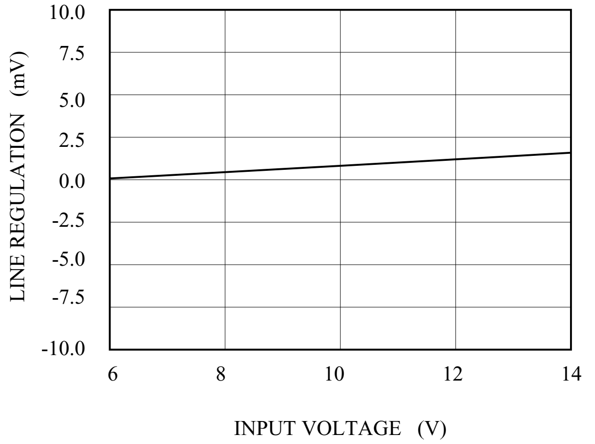


Fig.4-3 LINE REGULATION (KIA78D05AF)

Fig.5-1 TEMPERATURE VS. OUTPUT VOLTAGE
(KIA78D15AF)

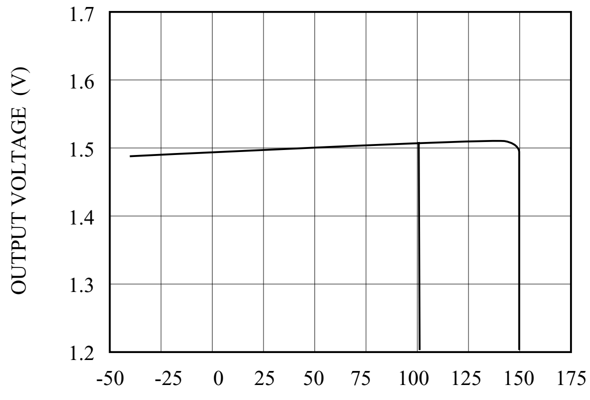


Fig.5-2 TEMPERATURE VS. OUTPUT VOLTAGE
(KIA78D33AF)

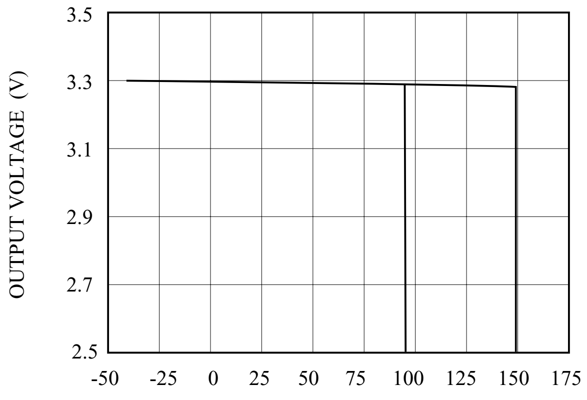


Fig.5-3 TEMPERATURE VS. OUTPUT VOLTAGE
(KIA78D05AF)

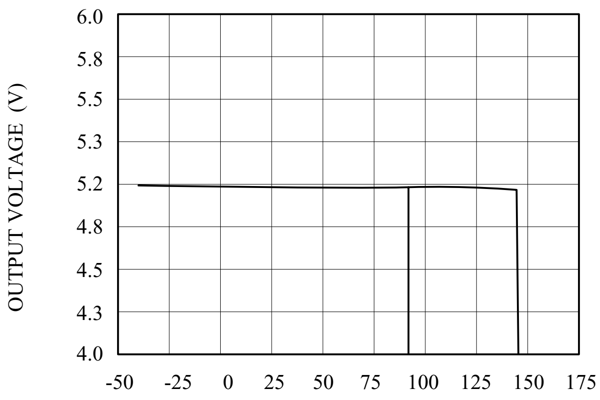


Fig.6-1 RIPPLE REJECTION
(KIA78D15AF)

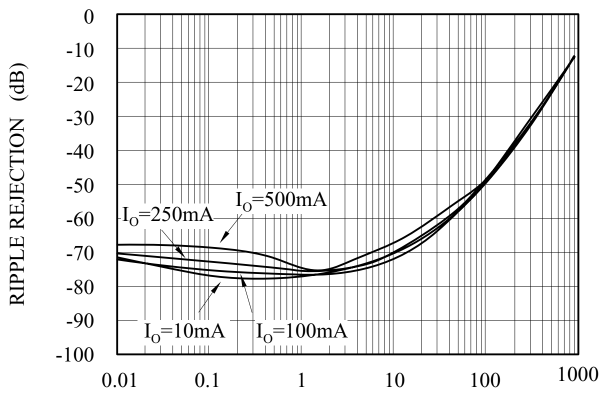


Fig.6-2 RIPPLE REJECTION
(KIA78D33AF)

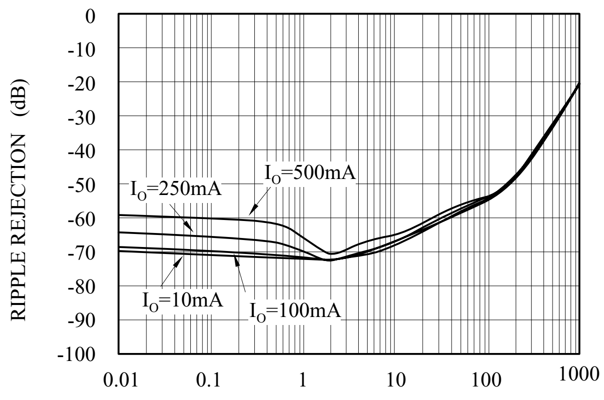


Fig.6-3 RIPPLE REJECTION
(KIA78D05AF)

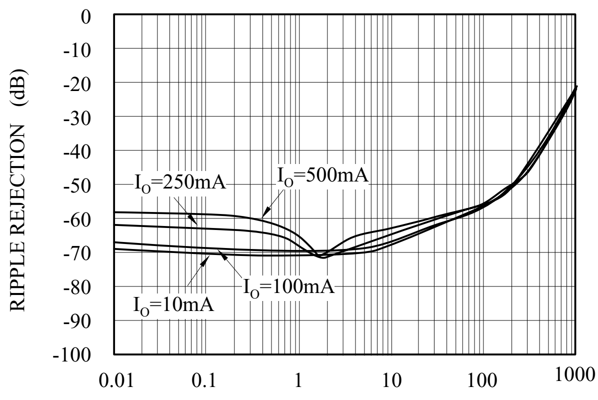


Fig.7-1 CURRENT LIMIT
(KIA78D15AF)

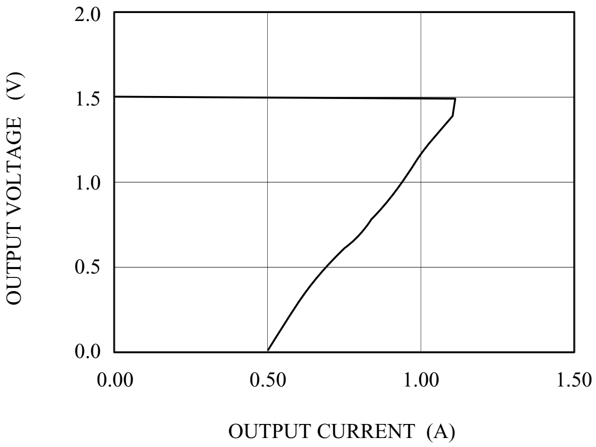


Fig.7-2 CURRENT LIMIT
(KIA78D33AF)

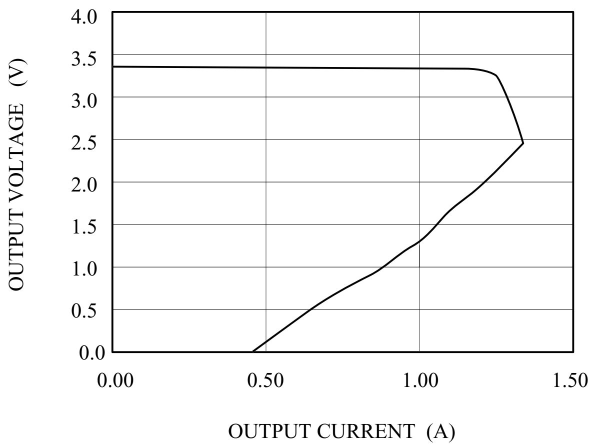


Fig.7-3 CURRENT LIMIT
(KIA78D05AF)

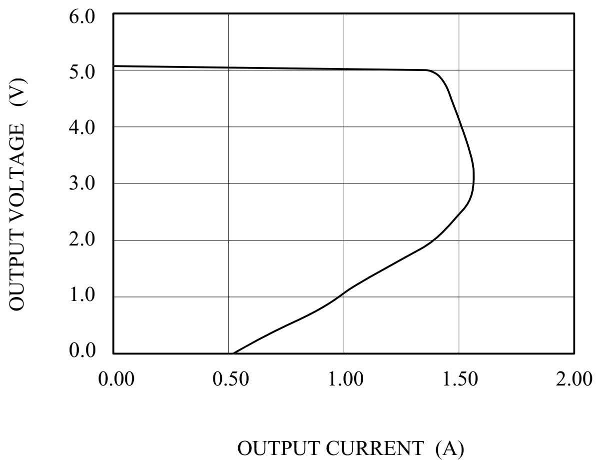


Fig. 8-1 ESR STABLE AREA
(KIA78D15AF)

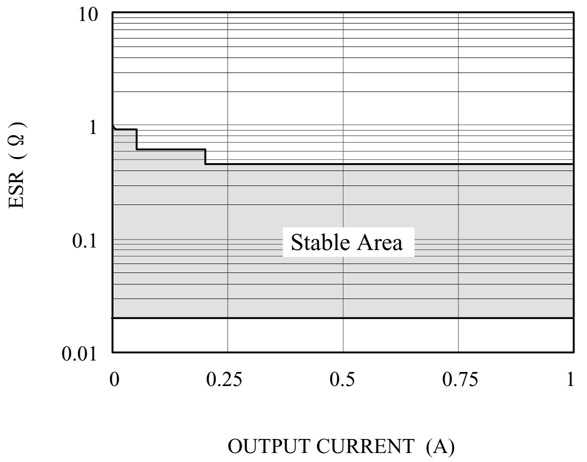


Fig. 8-2 ESR STABLE AREA
(KIA78D33AF)

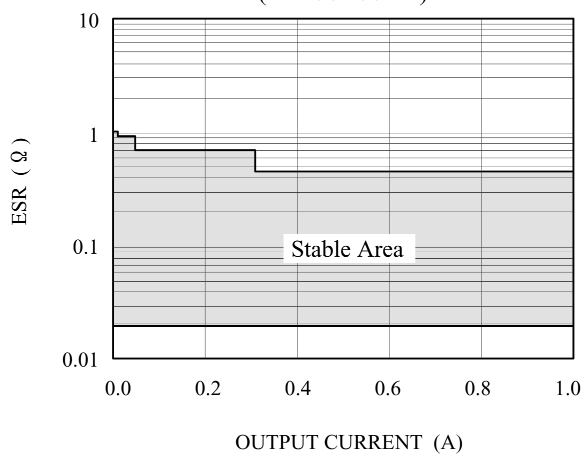


Fig. 8-3 ESR STABLE AREA
(KIA78D05AF)

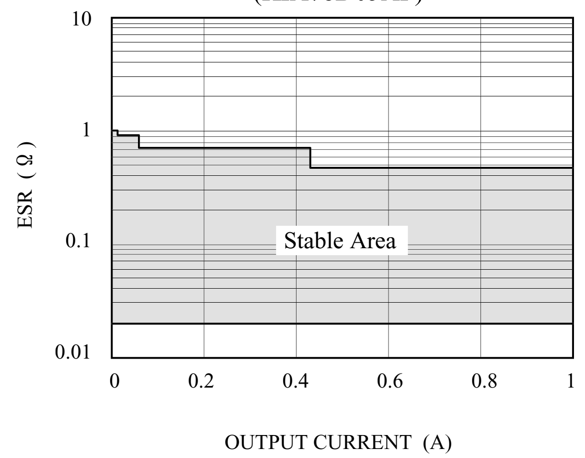


Fig.9-1 DROPOUT VOLTAGE
(KIA78D33AF)

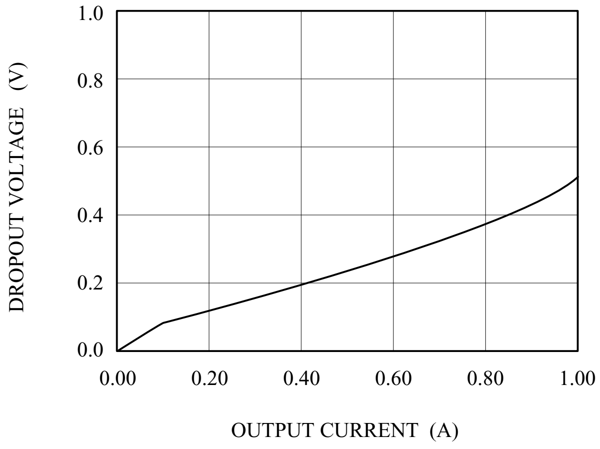


Fig.9-2 DROPOUT VOLTAGE
(KIA78D05AF)

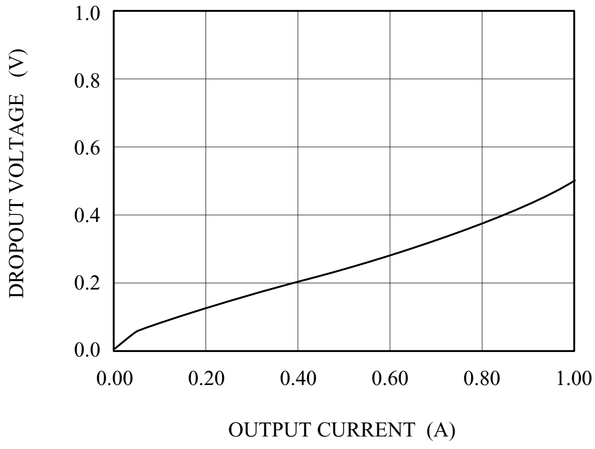


Fig.10 P_D -T_a (DPAK)

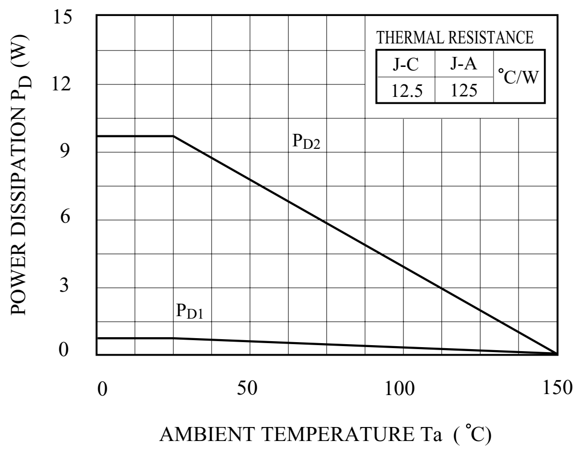
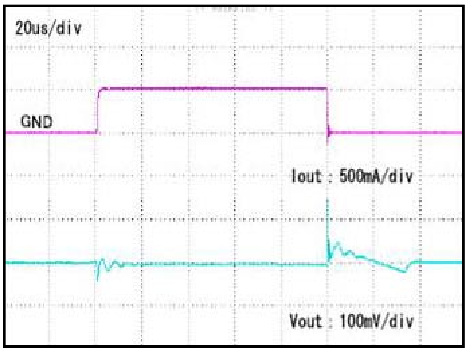
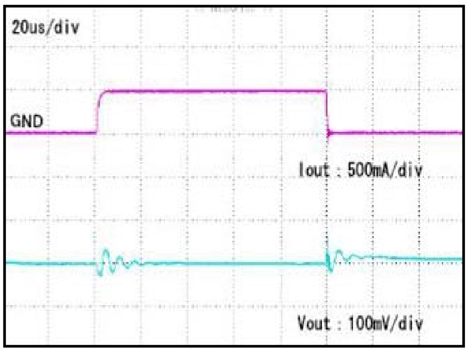


Fig.11-1 LOAD TRANSIENT RESPONSE
(KIA78D15AF)

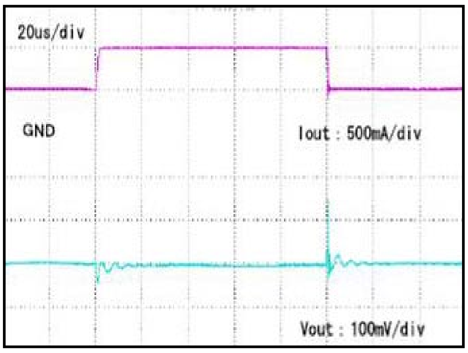
C_{IN} = 1μF, C_O = 1μF
I_O = 1mA → 500mA



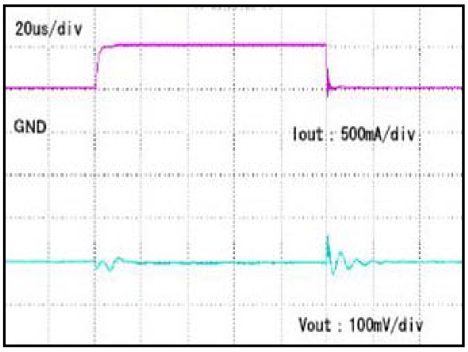
C_{IN} = 1μF, C_O = 10μF
I_O = 1mA → 500mA



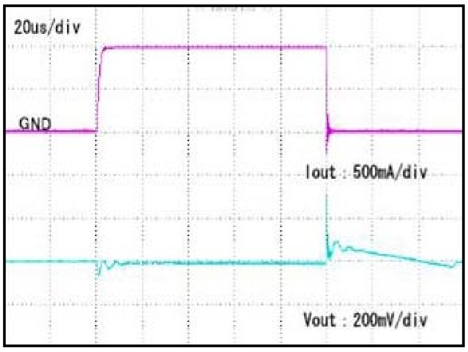
C_{IN} = 1μF, C_O = 1μF
I_O = 500mA → 1000mA



C_{IN} = 1μF, C_O = 10μF
I_O = 500mA → 1000mA



C_{IN} = 1μF, C_O = 1μF
I_O = 1mA → 1000mA



C_{IN} = 1μF, C_O = 10μF
I_O = 1mA → 1000mA

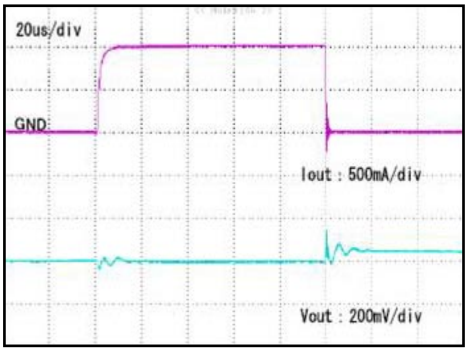
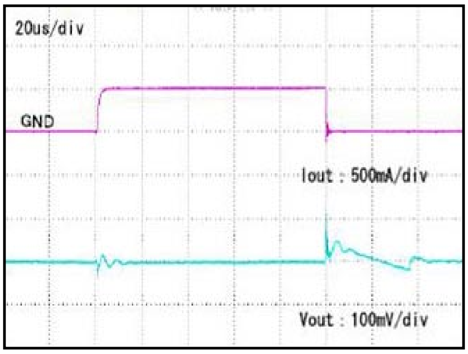
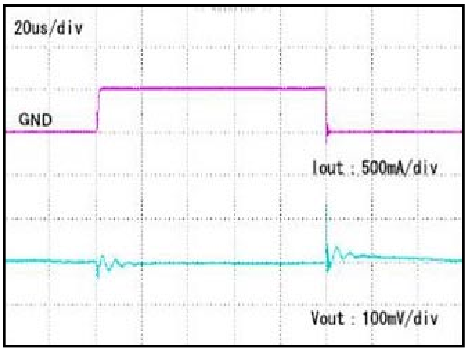


Fig.11-2 LOAD TRANSIENT RESPONSE
(KIA78D33AF)

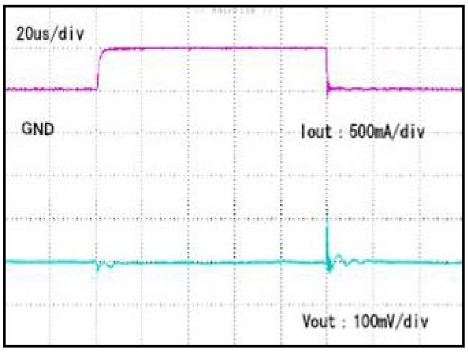
C_{IN} = 1μF, C_O = 1μF
I_O = 1mA → 500mA



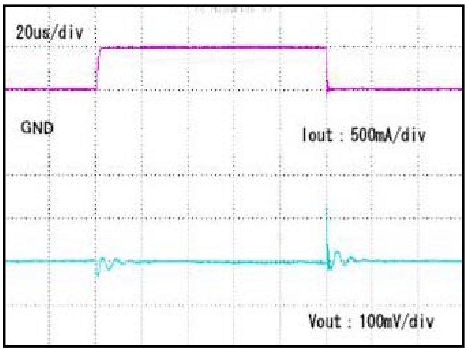
C_{IN} = 1μF, C_O = 10μF
I_O = 1mA → 500mA



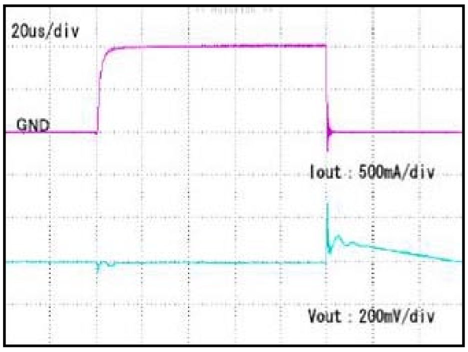
C_{IN} = 1μF, C_O = 1μF
I_O = 500mA → 1000mA



C_{IN} = 1μF, C_O = 10μF
I_O = 500mA → 1000mA



C_{IN} = 1μF, C_O = 1μF
I_O = 1mA → 1000mA



C_{IN} = 1μF, C_O = 10μF
I_O = 1mA → 1000mA

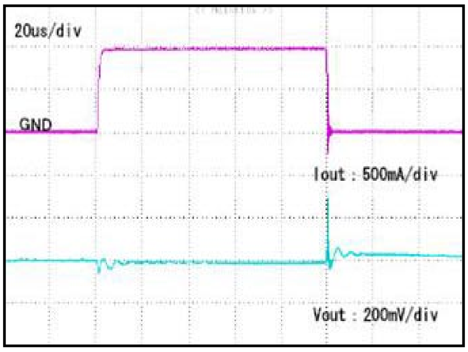


Fig.11-3 LOAD TRANSIENT RESPONSE
(KIA78D05AF)

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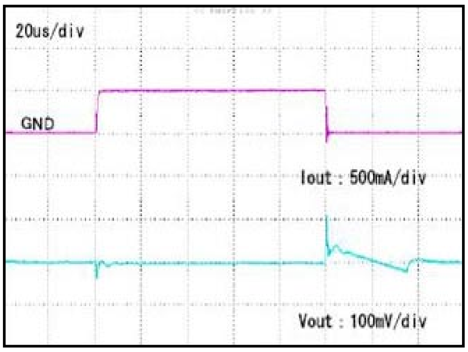
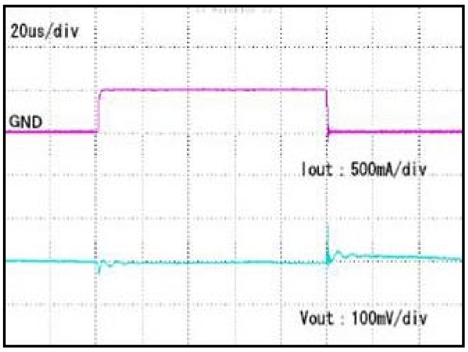
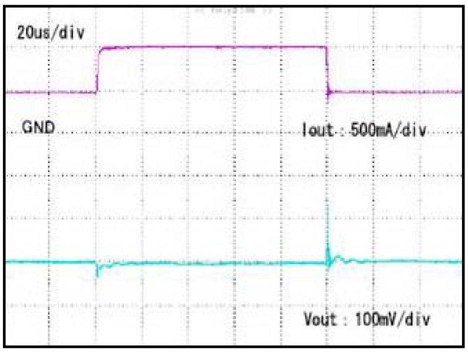
I_O = 1mA → 500mA



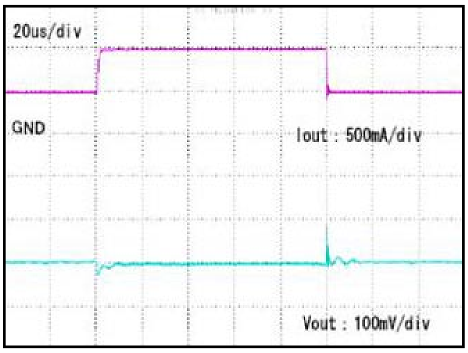
C_{IN} = 1μF, C_O = 10μF
I_O = 1mA → 500mA



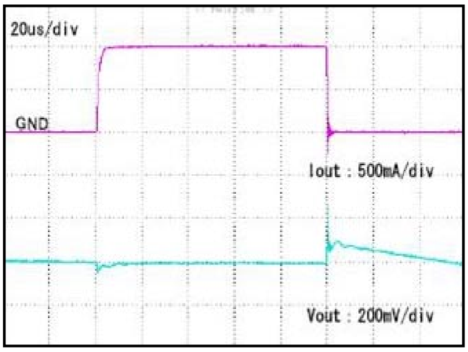
C_{IN} = 1μF, C_O = 1μF
I_O = 500mA → 1000mA



C_{IN} = 1μF, C_O = 10μF
I_O = 500mA → 1000mA



C_{IN} = 1μF, C_O = 1μF
I_O = 1mA → 1000mA



C_{IN} = 1μF, C_O = 10μF
I_O = 1mA → 1000mA