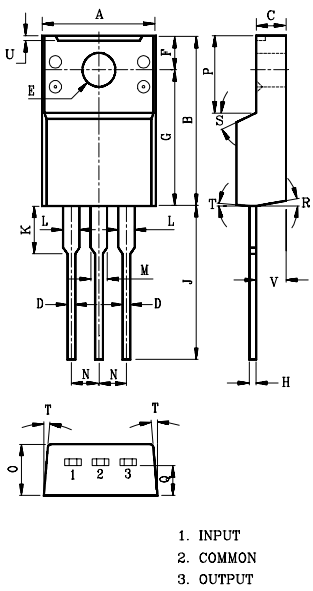
KIA78DL05PI~ KIA78DL15PI

BIPOLAR LINEAR INTEGRATED CIRCUIT

THREE TERMINAL POSITIVE LOW DROPOUT VOLTAGE REGULATOR
(5V, 6V, 8V, 9V, 10V, 12V, 15V)

The KIA78DL series are three-terminal regulators with maximum output current 250mA, packed in transistor size TO-220IS consuming low standby current, best suited as backup power supply for memory, etc. and power supply for medium size circuits.
This series is further provided with various protective functions.



DIM	MILLIMETERS
A	10.30 MAX
B	15.30 MAX
C	2.70±0.30
D	0.85 MAX
E	ø3.20±0.20
F	3.00±0.30
G	12.30 MAX
H	0.75 MAX
J	13.60±0.50
K	3.90 MAX
L	1.20
M	1.30
N	2.54
O	4.50±0.20
P	6.80
Q	2.60±0.20
R	10°
S	25°
T	5°
U	0.5
V	2.60±0.15

1. INPUT
2. COMMON
3. OUTPUT

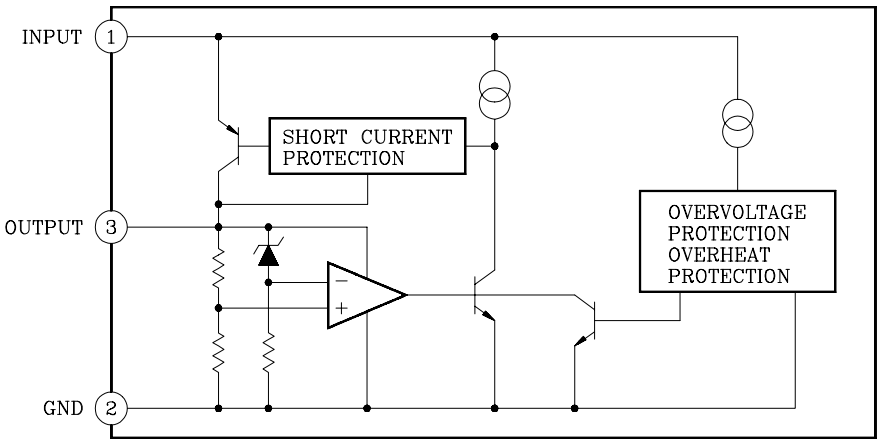
TO-220IS

FEATURES

- Low Standby Current Consumption : 500μA (Typ.).
- Maximum Output Current : 250mA (Max.).
- Less I/O Voltage Difference : 0.6V (Max).
- Multiple Protections
  : Power Reverse Connection/60V Load Dump/ Thermal Protection/Short-Circuit Protection.
- TO-220IS Isolation Package Which Require Neither Insulating Bushing Nor Mica Insulator.

MAXIMUM RATINGS (Ta=25℃)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Operating Input Voltage	V_{IN}	29	V
Input Voltage of Surge	V_{IN}	60	V
Power Dissipation	P_D	20	W
Junction Temperature	T_j	-40~150	℃
Operating Temperature	T_{opr}	-40~85	℃
Storage Temperature	T_{stg}	-55~150	℃
Lead Temperature Time	T_{sol}	260 (10sec)	℃



KIA78DL05PI

ELECTRICAL CHARACTERISTICS (V_{IN}=14V, I_{OUT}=10mA, T_j=25℃)

CHARACTERISTIC	SYMBOL	TEST CIRCUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Output Voltage	V_{OUT}	-	V_{IN}=5.35~26V, Ta=-40~85℃	4.5	5	5.5	V
Line Regulation	ΔV_{OUT}(1)	-	V_{IN}=9~16V	-	2	10	mV
			V_{IN}=6~26V	-	4	30	
Load Regulation	ΔV_{OUT}(2)	-	I_{OUT}=10~200mA	-	14	50	mV
Quiescent Current	I_{CC}	-	I_{OUT}≦10mA, V_{IN}=6~26V	-	0.5	1	mA
Dropout Voltage	V_{DROP}	-	I_{OUT}= 50mA	-	0.15	0.3	V
			I_{OUT}=200mA	-	0.4	0.6	
Max. Operating Input Voltage	V_{IN}	-		29	33	-	V

KIA78DL06PI

ELECTRICAL CHARACTERISTICS (V_{IN}=14V, I_{OUT}=10mA, T_j=25℃)

CHARACTERISTIC	SYMBOL	TEST CIRCUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Output Voltage	V_{OUT}	-	V_{IN}=6.35~26V, Ta=-40~85℃	5.4	6	6.6	V
Line Regulation	ΔV_{OUT}(1)	-	V_{IN}=10~17V	-	2	12	mV
			V_{IN}=7~26V	-	5	36	
Load Regulation	ΔV_{OUT}(2)	-	I_{OUT}=10~200mA	-	17	60	mV
Quiescent Current	I_{CC}	-	I_{OUT}≦10mA, V_{IN}=7~26V	-	0.55	-	mA
Dropout Voltage	V_{DROP}	-	I_{OUT}= 50mA	-	0.15	0.3	V
			I_{OUT}=200mA	-	0.4	0.6	
Max. Operating Input Voltage	V_{IN}	-		29	33	-	V

KIA78DL08PI

ELECTRICAL CHARACTERISTICS (V_{IN}=16V, I_{OUT}=10mA, T_j=25℃)

CHARACTERISTIC	SYMBOL	TEST CIRCUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Output Voltage	V_{OUT}	-	8.35V≦V_{IN}≦26V, -40℃≦Ta≦85℃	7.2	8	8.8	V
Line Regulation	ΔV_{OUT}(1)	-	12V≦V_{IN}≦19V	-	3	16	mV
			9V≦V_{IN}≦26V	-	6	45	
Load Regulation	ΔV_{OUT}(2)	-	10mA≦I_{OUT}≦200mA	-	22	80	mV
Quiescent Current	I_{CC}	-	I_{OUT}≦10mA, 9V≦V_{IN}≦26V	-	0.6	-	mA
Dropout Voltage	V_{DROP}	-	I_{OUT}= 50mA	-	0.15	0.3	V
			I_{OUT}=200mA	-	0.4	0.6	
Max. Operating Input Voltage	V_{IN}	-	-	29	33	-	V

KIA78DL09PI

ELECTRICAL CHARACTERISTICS (V_{IN}=16V, I_{OUT}=10mA, T_j=25℃)

CHARACTERISTIC	SYMBOL	TEST CIRCUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Output Voltage	V_{OUT}	-	9.35V≦V_{IN}≦26V, -40℃≦Ta≦85℃	8.1	9	9.9	V
Line Regulation	ΔV_{OUT}(1)	-	13V≦V_{IN}≦20V	-	3	18	mV
			10V≦V_{IN}≦26V	-	7	50	
Load Regulation	ΔV_{OUT}(2)	-	10mA≦I_{OUT}≦200mA	-	25	90	mV
Quiescent Current	I_{CC}	-	I_{OUT}≦10mA, 10V≦V_{IN}≦26V	-	0.65	-	mA
Dropout Voltage	V_{DROP}	-	I_{OUT}= 50mA	-	0.15	0.3	V
			I_{OUT}=200mA	-	0.4	0.6	
Max. Operating Input Voltage	V_{IN}	-	-	29	33	-	V

KIA78DL10PI

ELECTRICAL CHARACTERISTICS (V_{IN}=16V, I_{OUT}=10mA, T_j=25℃)

CHARACTERISTIC	SYMBOL	TEST CIRCUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Output Voltage	V_{OUT}	-	10.35V≦V_{IN}≦26V, -40℃≦Ta≦85℃	9	10	11	V
Line Regulation	ΔV_{OUT}(1)	-	14V≦V_{IN}≦21V	-	4	20	mV
			11V≦V_{IN}≦26V	-	8	60	
Load Regulation	ΔV_{OUT}(2)	-	10mA≦I_{OUT}≦200mA	-	28	100	mV
Quiescent Current	I_{CC}	-	I_{OUT}≦10mA, 11V≦V_{IN}≦26V	-	0.7	-	mA
Dropout Voltage	V_{DROP}	-	I_{OUT}= 50mA	-	0.15	0.3	V
			I_{OUT}=200mA	-	0.4	0.6	
Max. Operating Input Voltage	V_{IN}	-	-	29	33	-	V

KIA78DL12PI

ELECTRICAL CHARACTERISTICS (V_{IN}=18V, I_{OUT}=10mA, T_j=25℃)

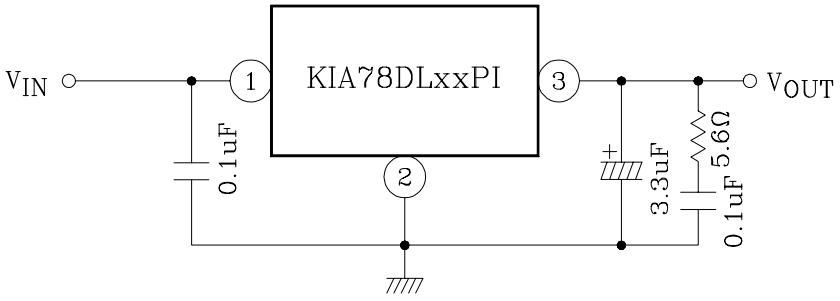
CHARACTERISTIC	SYMBOL	TEST CIRCUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Output Voltage	V_{OUT}	-	12.35V≦V_{IN}≦26V, -40℃≦Ta≦85℃	10.8	12	13.2	V
Line Regulation	ΔV_{OUT}(1)	-	16V≦V_{IN}≦23V	-	5	24	mV
			13V≦V_{IN}≦26V	-	10	70	
Load Regulation	ΔV_{OUT}(2)	-	10mA≦I_{OUT}≦200mA	-	33	120	mV
Quiescent Current	I_{CC}	-	I_{OUT}≦10mA, 13V≦V_{IN}≦26V	-	0.8	-	mA
Dropout Voltage	V_{DROP}	-	I_{OUT}=50mA	-	0.15	0.3	V
			I_{OUT}=200mA	-	0.4	0.6	
Max. Operating Input Voltage	V_{IN}	-	-	29	33	-	V

KIA78DL15PI

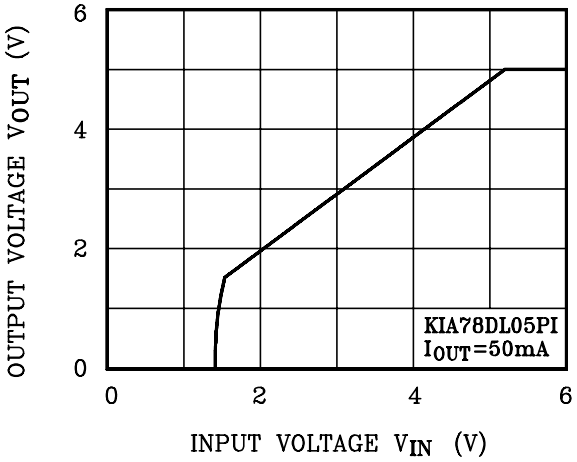
ELECTRICAL CHARACTERISTICS (V_{IN}=20V, I_{OUT}=10mA, T_j=25℃)

CHARACTERISTIC	SYMBOL	TEST CIRCUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Output Voltage	V_{OUT}	-	15.35V≦V_{IN}≦26V, -40℃≦Ta≦85℃	13.5	15	16.5	V
Line Regulation	ΔV_{OUT}(1)	-	19V≦V_{IN}≦26V	-	6	30	mV
			16V≦V_{IN}≦26V	-	12	80	
Load Regulation	ΔV_{OUT}(2)	-	10mA≦I_{OUT}≦200mA	-	40	150	mV
Quiescent Current	I_{CC}	-	I_{OUT}≦10mA, 16V≦V_{IN}≦26V	-	0.9	-	mA
Dropout Voltage	V_{DROP}	-	I_{OUT}=50mA	-	0.15	0.3	V
			I_{OUT}=200mA	-	0.4	0.6	
Max. Operating Input Voltage	V_{IN}	-	-	29	33	-	V

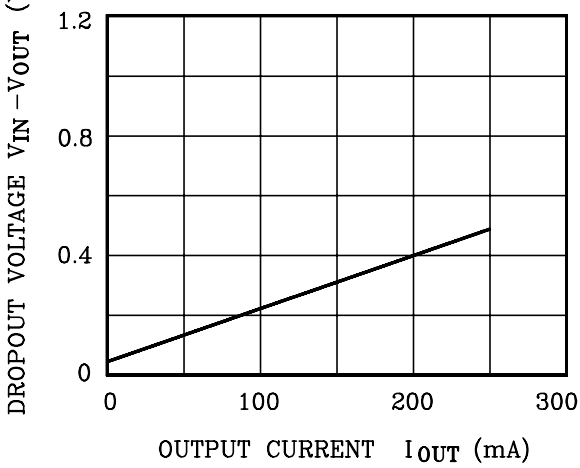
TEST CIRCUIT



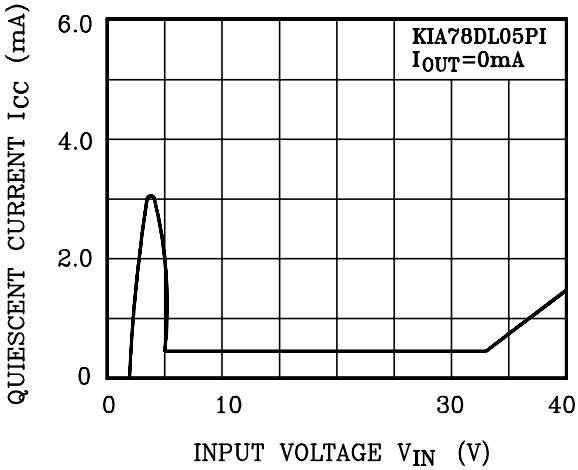
$|V_{OUT} - V_{IN}|$



$|V_{IN} - V_{OUT}| - I_{OUT}$



$I_{CC} - V_{IN}$



$P_D - Ta$