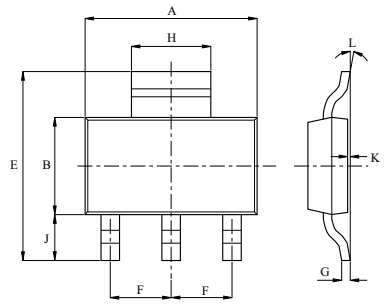
3 TERMINAL LOW DROP VOLTAGE REGULATOR

The KIA78DXXXS/F 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.
· Bulit in Over Current Protection, Over Heat Protetion Function.
· Low Quiescent Current :0.8mA (Typ.)



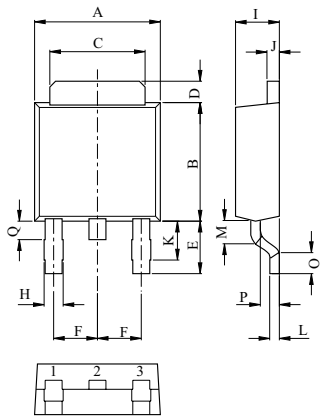
DIM	MILLIMETERS
A	6.5±0.2
B	3.5±0.2
C	1.8 MAX
D	0.7+0.15/-0.1
E	7±0.3
F	2.3 TYP
G	0.26+0.09/-0.02
H	3.0+0.15/-0.1
J	1.75±0.25
K	0.1 MAX
L	10° MAX

1. INPUT
2. COMMON
3. OUTPUT

SOT-223

LINE UP

ITEM	OUTPUT VOLTAGE (Typ.)	UNIT
KIA78D125S/F	1.25	S : SOT-223 F : DPAK
KIA78D015S/F	1.5	
KIA78D018S/F	1.8	
KIA78D020S/F	2.0	
KIA78D025S/F	2.5	
KIA78D030S/F	3.0	
KIA78D033S/F	3.3	
KIA78D050S/F	5.0	



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. INPUT
2. COMMON
3. OUTPUT

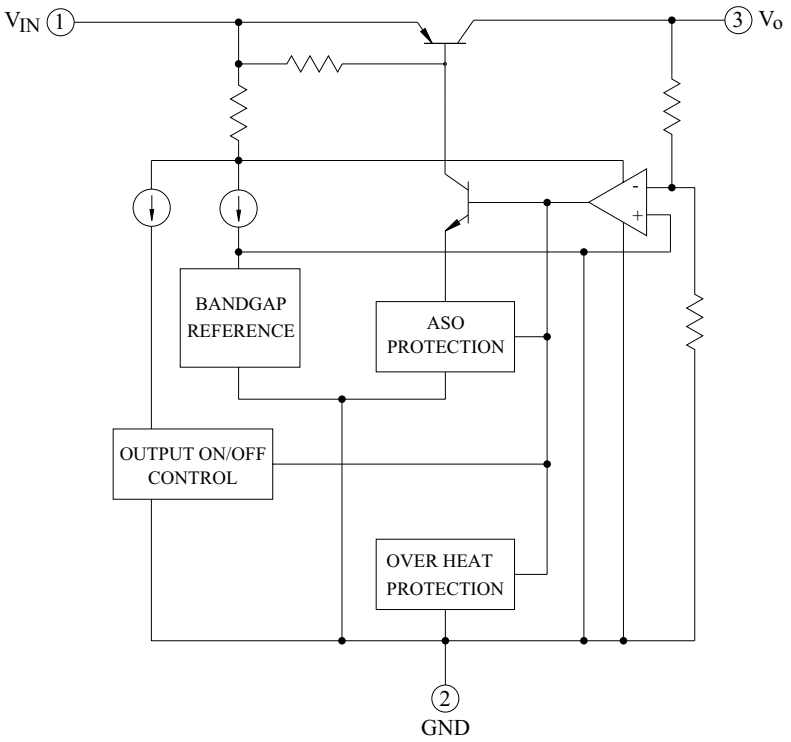
DPAK

MAXIMUM RATINGS (Ta=25℃)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Input Voltage		V_{IN}	16	V
Output Current		I_{OUT}	1	A
Power Dissipation-1 (No Heatsink)	S (Note)	P_{D1}	1.0	W
	F		1.3	
Power Dissipation-2 (Without Heatsink)	S	P_{D2}	8.3	W
	F		13	
Junction Temperature		T_j	150	℃
Operating Temperature		T_{opr}	-20~80	℃
Storage Temperature		T_{stg}	-30~150	℃
Soldering Temperature		T_{sol}	260	℃

Note) Package Mounted on FR-4 PCB 36 ×18 ×1.5㎜ : mounting pad for the GND Lead min. 6㎠

BLOCK DIAGRAM



ELECTRICAL CHARACTERISTICS

KIA78D125S/F (Unless otherwise specified, V_{IN}=2.8V, Tj=25℃)

CHARACTERISTIC	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Output Voltage	V_{OUT}	V_{IN}=2.8V, I_{OUT}=0.5A	1.225	1.25	1.275	V
		2.8V ≦V_{IN} ≦12V, 5mA ≦I_{OUT} ≦1A, 0℃ ≦Tj ≦125℃	1.21	1.25	1.29	
Line Regulation	Reg Line	2.8V ≦V_{IN} ≦12V, I_{OUT}=0.5A	-	5	20	mV
Load Regulation	Reg Load	V_{IN}=2.8V, 5mA ≦I_{OUT} ≦1A,	-	5	20	mV
Quiescent Current	I_B	2.8V ≦V_{IN} ≦12V, I_{OUT}=0A	-	0.8	1.8	mA
		2.8V ≦V_{IN} ≦12V, I_{OUT}=1A	-	10	20	
Starting Quiescent Current	I_{Bstart}	V_{IN}=2.1V, I_{OUT}=0A	-	0.7	5	mA
		V_{IN}=2.5V, I_{OUT}=1A	-	10	30	
Output Noise Voltage	V_{NO}	V_{IN}=2.8V, I_{OUT}=50mA, 10Hz ≦f ≦100kHz	-	110	-	μVrms
Ripple Rejection	R · R	2.8V ≦V_{IN} ≦12V, I_{OUT}=50mA, f=120Hz	53	65	-	dB
Dropout Voltage	V_D	I_{OUT}=0.5A	-	0.3	0.5	V
		I_{OUT}=1A	-	0.5	-	

ELECTRICAL CHARACTERISTICS

KIA78D015S/F (Unless otherwise specified, V_{IN}=3.8V, Tj=25℃)

CHARACTERISTIC	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Output Voltage	V_{OUT}	V_{IN}=3.8V, I_{OUT}=0.5A	1.45	1.5	1.55	V
		2.8V ≦V_{IN} ≦12V, 5mA ≦I_{OUT} ≦1A, 0℃ ≦Tj ≦125℃	1.434	1.5	1.566	
Line Regulation	Reg Line	2.8V ≦V_{IN} ≦12V, I_{OUT}=0.5A	-	5	20	mV
Load Regulation	Reg Load	V_{IN}=3.8V, 5mA ≦I_{OUT} ≦1A,	-	5	20	mV
Quiescent Current	I_B	2.8V ≦V_{IN} ≦12V, I_{OUT}=0A	-	0.8	1.8	mA
		2.8V ≦V_{IN} ≦12V, I_{OUT}=1A	-	10	20	
Starting Quiescent Current	I_{Bstart}	V_{IN}=2.1V, I_{OUT}=0A	-	0.7	5	mA
		V_{IN}=2.5V, I_{OUT}=1A	-	10	30	
Output Noise Voltage	V_{NO}	V_{IN}=3.8V, I_{OUT}=50mA, 10Hz ≦f ≦100kHz	-	75	-	μVrms
Ripple Rejection	R · R	2.8V ≦V_{IN} ≦12V, I_{OUT}=50mA, f=120Hz	53	65	-	dB
Dropout Voltage	V_D	I_{OUT}=0.5A	-	0.5	0.7	V
		I_{OUT}=1A	-	0.6	-	

ELECTRICAL CHARACTERISTICS

KIA78D018S/F (Unless otherwise specified, V_{IN}=3.8V, Tj=25℃)

CHARACTERISTIC	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Output Voltage	V_{OUT}	V_{IN}=3.8V, I_{OUT}=0.5A	1.75	1.8	1.85	V
		2.8V≦V_{IN}≦12V, 5mA≦I_{OUT}≦1A, 0℃≦Tj≦125℃	1.732	1.8	1.868	
Line Regulation	Reg Line	2.8V≦V_{IN}≦12V, I_{OUT}=0.5A	-	5	20	mV
Load Regulation	Reg Load	V_{IN}=3.8V, 5mA≦I_{OUT}≦1A,	-	5	20	mV
Quiescent Current	I_B	2.8V≦V_{IN}≦12V, I_{OUT}=0A	-	0.8	1.8	mA
		2.8V≦V_{IN}≦12V, I_{OUT}=1A	-	10	20	
Starting Quiescent Current	I_{Bstart}	V_{IN}=2.1V, I_{OUT}=0A	-	0.7	5	mA
		V_{IN}=2.5V, I_{OUT}=1A	-	10	30	
Output Noise Voltage	V_{NO}	V_{IN}=3.8V, I_{OUT}=50mA, 10Hz≦f≦100kHz	-	75	-	μVrms
Ripple Rejection	R · R	2.8V≦V_{IN}≦12V, I_{OUT}=50mA, f=120Hz	53	65	-	dB
Dropout Voltage	V_D	I_{OUT}=0.5A	-	0.3	0.5	V
		I_{OUT}=1A	-	0.5	-	

ELECTRICAL CHARACTERISTICS

KIA78D020S/F (Unless otherwise specified, V_{IN}=4V, Tj=25℃)

CHARACTERISTIC	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Output Voltage	V_{OUT}	V_{IN}=4V, I_{OUT}=0.5A	1.95	2.0	2.05	V
		3V≦V_{IN}≦12V, 5mA≦I_{OUT}≦1A, 0℃≦Tj≦125℃	1.93	2.0	2.07	
Line Regulation	Reg Line	3.0V≦V_{IN}≦12V, I_{OUT}=0.5A	-	5	20	mV
Load Regulation	Reg Load	V_{IN}=4V, 5mA≦I_{OUT}≦1A,	-	5	20	mV
Quiescent Current	I_B	3.0V≦V_{IN}≦12V, I_{OUT}=0A	-	0.8	1.8	mA
		3.0V≦V_{IN}≦12V, I_{OUT}=1A	-	10	20	
Starting Quiescent Current	I_{Bstart}	V_{IN}=2.1V, I_{OUT}=0A	-	0.7	5	mA
		V_{IN}=2.5V, I_{OUT}=1A	-	10	30	
Output Noise Voltage	V_{NO}	V_{IN}=4V, I_{OUT}=50mA, 10Hz≦f≦100kHz	-	80	-	μVrms
Ripple Rejection	R · R	3.0V≦V_{IN}≦12V, I_{OUT}=50mA, f=120Hz	52	65	-	dB
Dropout Voltage	V_D	I_{OUT}=0.5A	-	0.3	0.5	V
		I_{OUT}=1A	-	0.5	-	

ELECTRICAL CHARACTERISTICS

KIA78D025S/F (Unless otherwise specified, V_{IN}=4.5V, Tj=25℃)

CHARACTERISTIC	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Output Voltage	V_{OUT}	V_{IN}=4.5V, I_{OUT}=0.5A	2.438	2.5	2.562	V
		3.5V ≦V_{IN} ≦12V, 5mA ≦I_{OUT} ≦1A, 0℃ ≦Tj ≦125℃	2.412	2.5	2.588	
Line Regulation	Reg Line	3.5V ≦V_{IN} ≦12V, I_{OUT}=0.5A	-	5	20	mV
Load Regulation	Reg Load	V_{IN}=4.5V, 5mA ≦I_{OUT} ≦1A,	-	5	20	mV
Quiescent Current	I_B	3.5V ≦V_{IN} ≦12V, I_{OUT}=0A	-	0.8	1.8	mA
		3.5V ≦V_{IN} ≦12V, I_{OUT}=1A	-	10	20	
Starting Quiescent Current	I_{Bstart}	V_{IN}=2.1V, I_{OUT}=0A	-	0.9	5	mA
		V_{IN}=2.7V, I_{OUT}=1A	-	12	30	
Output Noise Voltage	V_{NO}	V_{IN}=4.5V, I_{OUT}=50mA, 10Hz ≦f≦100kHz	-	95	-	μVrms
Ripple Rejection	R · R	3.5V ≦V_{IN} ≦12V, I_{OUT}=50mA, f=120Hz	53	64	-	dB
Dropout Voltage	V_D	I_{OUT}=0.5A	-	0.3	0.5	V
		I_{OUT}=1A	-	0.5	-	

ELECTRICAL CHARACTERISTICS

KIA78D030S/F (Unless otherwise specified, V_{IN}=5V, Tj=25℃)

CHARACTERISTIC	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Output Voltage	V_{OUT}	V_{IN}=5.0V, I_{OUT}=0.5A	2.925	3.0	3.075	V
		4.0V ≦V_{IN} ≦12V, 5mA ≦I_{OUT} ≦1A, 0℃ ≦Tj ≦125℃	2.895	3.0	3.105	
Line Regulation	Reg Line	4.0V ≦V_{IN} ≦12V, I_{OUT}=0.5A	-	5	20	mV
Load Regulation	Reg Load	V_{IN}=5.0V, 5mA ≦I_{OUT} ≦1A,	-	5	20	mV
Quiescent Current	I_B	4.0V ≦V_{IN} ≦12V, I_{OUT}=0A	-	0.8	1.8	mA
		4.0V ≦V_{IN} ≦12V, I_{OUT}=1A	-	10	20	
Starting Quiescent Current	I_{Bstart}	V_{IN}=2.1V, I_{OUT}=0A	-	1.1	5	mA
		V_{IN}=2.8V, I_{OUT}=1A	-	13	30	
Output Noise Voltage	V_{NO}	V_{IN}=5.0V, I_{OUT}=50mA, 10Hz ≦f≦100kHz	-	110	-	μVrms
Ripple Rejection	R · R	4.0V ≦V_{IN} ≦12V, I_{OUT}=50mA, f=120Hz	50	63	-	dB
Dropout Voltage	V_D	I_{OUT}=0.5A	-	0.3	0.5	V
		I_{OUT}=1A	-	0.5	-	

ELECTRICAL CHARACTERISTICS

KIA78D033S/F (Unless otherwise specified, V_{IN}=5.3V, Tj=25℃)

CHARACTERISTIC	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Output Voltage	V_{OUT}	V_{IN}=5.3V, I_{OUT}=0.5A	3.218	3.3	3.382	V
		4.3V≦V_{IN}≦12V, 5mA≦I_{OUT}≦1A, 0℃≦Tj≦125℃	3.184	3.3	3.416	
Line Regulation	Reg Line	4.3V≦V_{IN}≦12V, I_{OUT}=0.5A	-	5	20	mV
Load Regulation	Reg Load	V_{IN}=5.3V, 5mA≦I_{OUT}≦1A,	-	5	20	mV
Quiescent Current	I_B	4.3V≦V_{IN}≦12V, I_{OUT}=0A	-	0.8	1.8	mA
		4.3V≦V_{IN}≦12V, I_{OUT}=1A	-	10	20	
Starting Quiescent Current	I_{Bstart}	V_{IN}=2.1V, I_{OUT}=0A	-	1.1	5	mA
		V_{IN}=2.9V, I_{OUT}=1A	-	13	30	
Output Noise Voltage	V_{NO}	V_{IN}=5.3V, I_{OUT}=50mA, 10Hz≦f≦100kHz	-	115	-	μVrms
Ripple Rejection	R · R	4.3V≦V_{IN}≦12V, I_{OUT}=50mA, f=120Hz	48	61	-	dB
Dropout Voltage	V_D	I_{OUT}=0.5A	-	0.3	0.5	V
		I_{OUT}=1A	-	0.5	-	

ELECTRICAL CHARACTERISTICS

KIA78D050S/F (Unless otherwise specified, V_{IN}=7V, Tj=25℃)

CHARACTERISTIC	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Output Voltage	V_{OUT}	V_{IN}=7V, I_{OUT}=0.5A	4.88	5.0	5.12	V
		6.0V≦V_{IN}≦12V, 5mA≦I_{OUT}≦1A, 0℃≦Tj≦125℃	4.83	5.0	5.17	
Line Regulation	Reg Line	6.0V≦V_{IN}≦12V, I_{OUT}=0.5A	-	5	20	mV
Load Regulation	Reg Load	V_{IN}=7.0V, 5mA≦I_{OUT}≦1A,	-	5	20	mV
Quiescent Current	I_B	6.0V≦V_{IN}≦12V, I_{OUT}=0A	-	0.8	1.8	mA
		6.0V≦V_{IN}≦12V, I_{OUT}=1A	-	10	20	
Starting Quiescent Current	I_{Bstart}	V_{IN}=2.1V, I_{OUT}=0A	-	1.3	5	mA
		V_{IN}=3.0V, I_{OUT}=1A	-	14	30	
Output Noise Voltage	V_{NO}	V_{IN}=7.0V, I_{OUT}=50mA, 10Hz≦f≦100kHz	-	150	-	μVrms
Ripple Rejection	R · R	6.0V≦V_{IN}≦12V, I_{OUT}=50mA, f=120Hz	48	60	-	dB
Dropout Voltage	V_D	I_{OUT}=0.5A	-	0.3	0.5	V
		I_{OUT}=1A	-	0.5	-	

Fig. 1 Standard Test Circuit

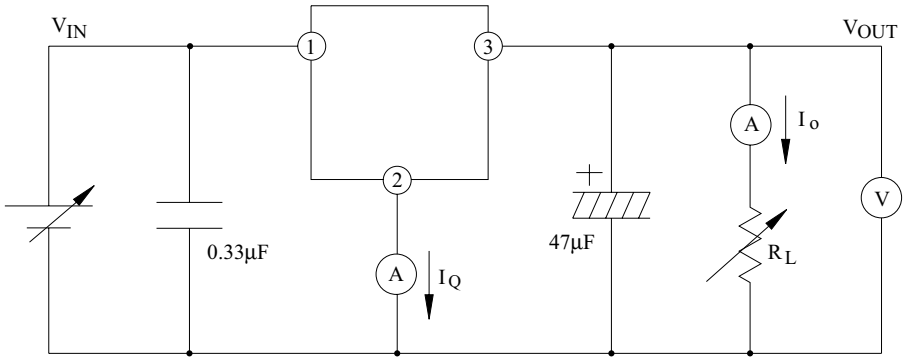


Fig. 2 Ripple Rejection Test Circuit

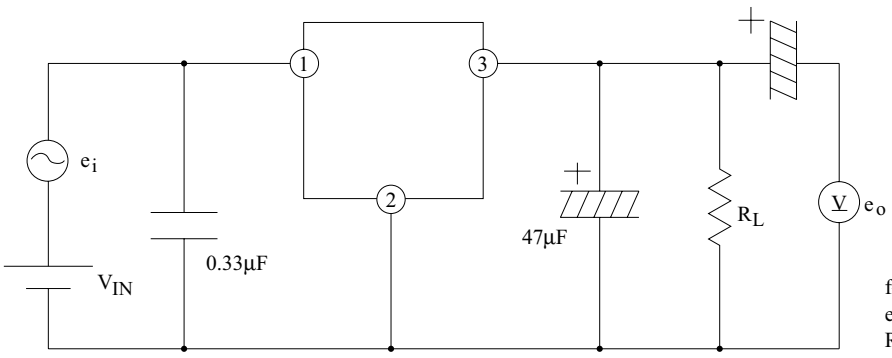


Fig. 3 Application Circuit for Standard

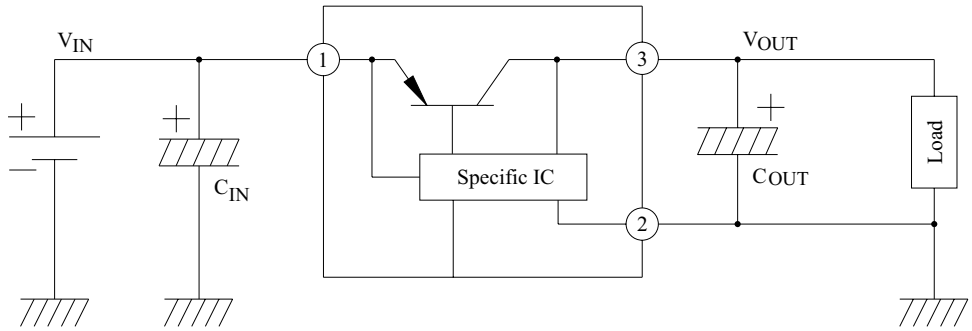


Fig. 4 V_{OUT} - T_j

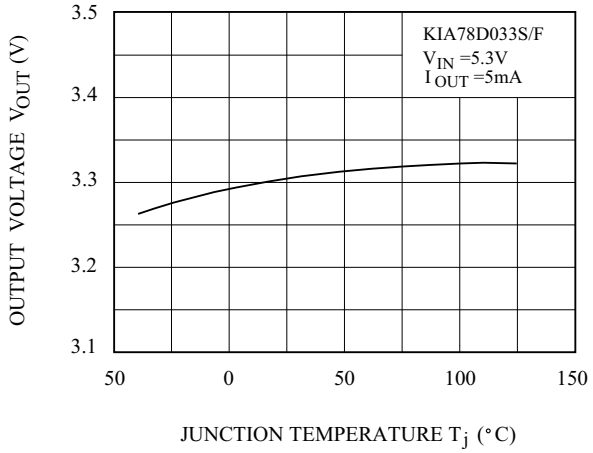


Fig. 5 V_{OUT} - V_{IN}

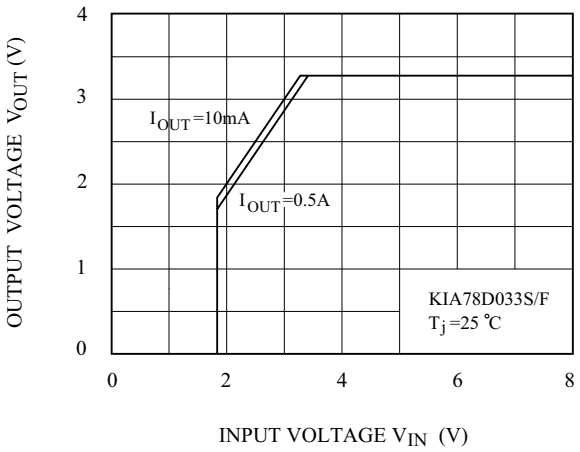


Fig. 6 I_B - V_{IN}

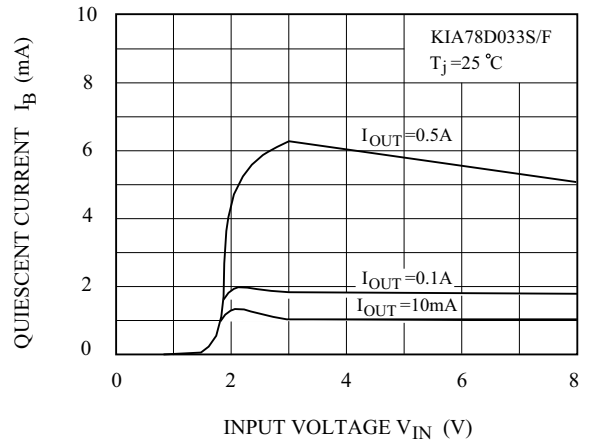


Fig. 7 I_B - T_j

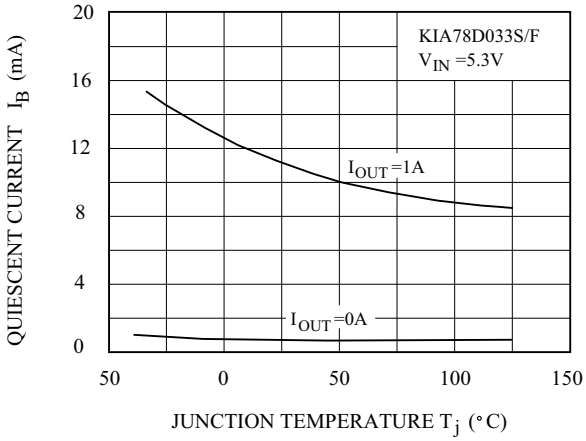


Fig. 8 I_B - I_{OUT}

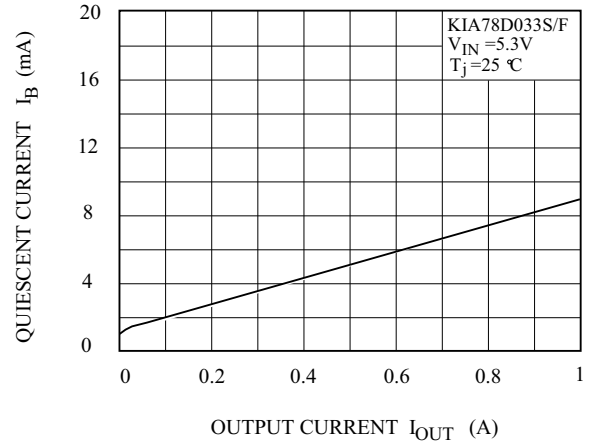


Fig. 9 V_{OUT}- I_{OUT}

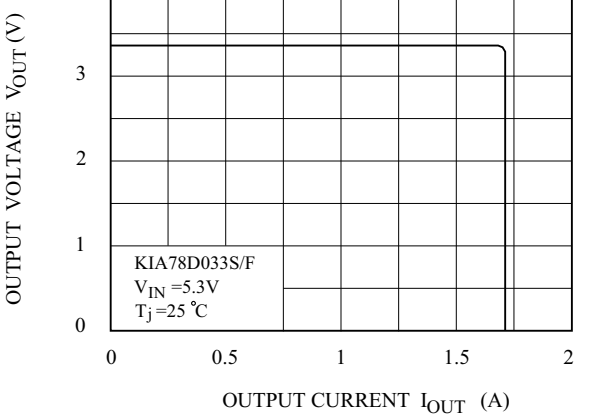


Fig.10 V_D - T_j

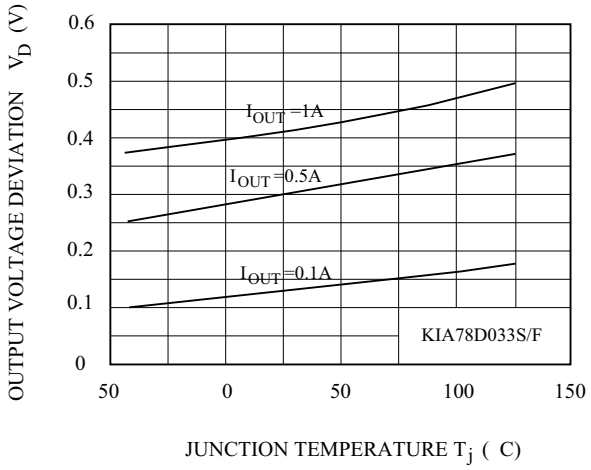


Fig.11 RR-f

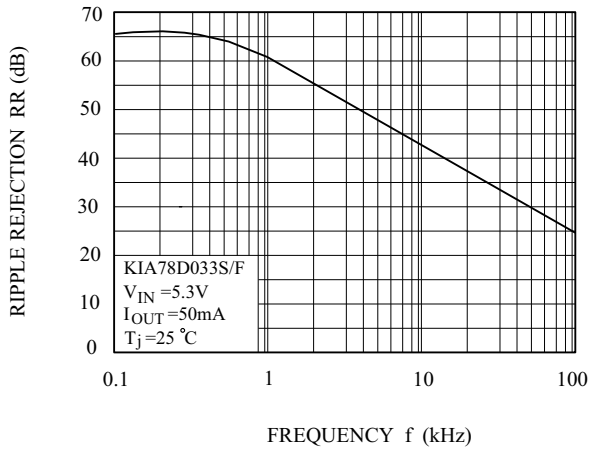


Fig.12 P_D - Ta (S-Type : SOT-223)

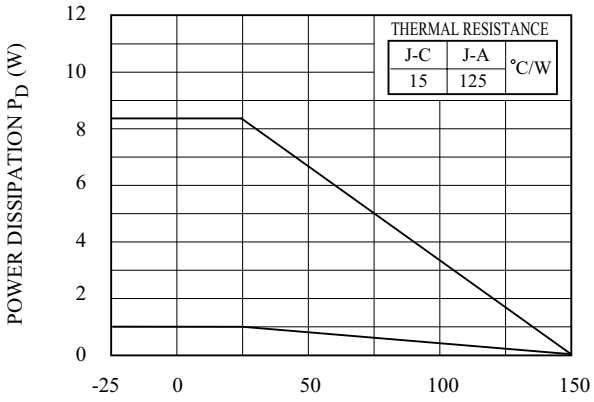


Fig.13 P_D - Ta (F-Type : DPAK)