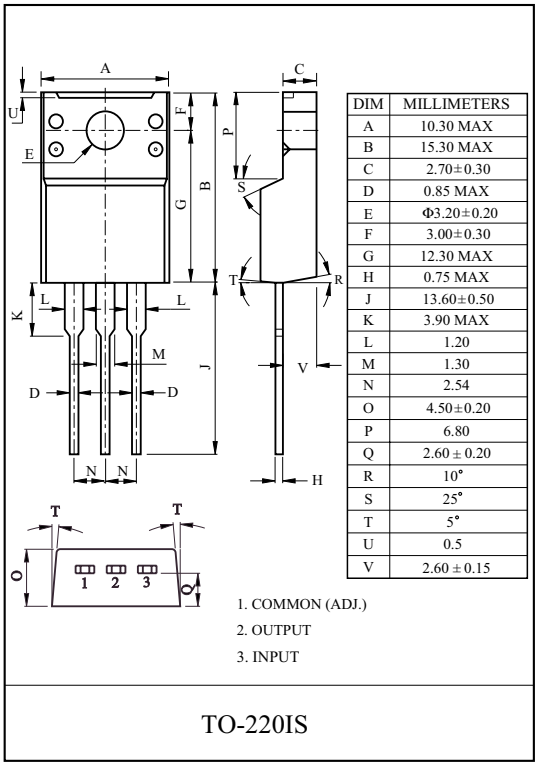
LOW DROP FIXED AND ADJUSTABLE
POSITIVE VOLTAGE REGULATOR

The KIA78Q × × ×PI is a Low Drop Voltage Regulator able to provide up to 0.8A of output current, available even in adjustable version (Vref=1.25V)



DIM	MILLIMETERS
A	10.30 MAX
B	15.30 MAX
C	2.70±0.30
D	0.85 MAX
E	Φ3.20±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. COMMON (ADJ.)
2. OUTPUT
3. INPUT

TO-220IS

FEATURES

· Low Dropout Voltage : 1.1V/Typ. (Iout=0.8A)
· Very Low Quiescent Current : 4.2㎃/Typ.
· Output Current up to 0.8A
· Fixed Output Voltage of 1.5V, 1.8V, 2.5V, 2.85V, 3.3V, 5.0V
· Adjustable Version Availability : Vref=1.25V
· Internal Current and Thermal Limit
· Only 10㎌ for stability
· Available in ±2%(at 25℃) and 4% in full Temperature range
· High Ripple Rejection : 80dB/Typ.
· Temperature Range : 0℃~125℃

LINE UP

ITEM	OUTPUT VOLTAGE (V)	PACKAGE
KIA78Q000PI	Adjustable (1.25~10V)	TO-220IS
KIA78Q015PI	1.5	
KIA78Q018PI	1.8	
KIA78Q025PI	2.5	
KIA78Q028PI	2.85	
KIA78Q033PI	3.3	
KIA78Q050PI	5.0	

MAXIMUM RATINGS (Ta=25℃)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Input Voltage	V_{IN}	10	V
Output Current	I_{OUT}	0.8	A
Power Dissipation 1 (No heatsink)	P_{D1}	2.0	W
Power Dissipation 2 (Without heatsink)	P_{D2}	20.8	W
Operating Temperature	T_{opr}	0~125	℃
Storage Temperature	T_{stg}	-55~150	℃

Fig.1 Application Circuit-1 (Fixed-Type)

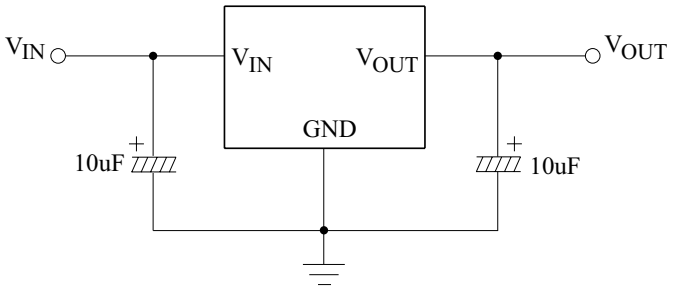
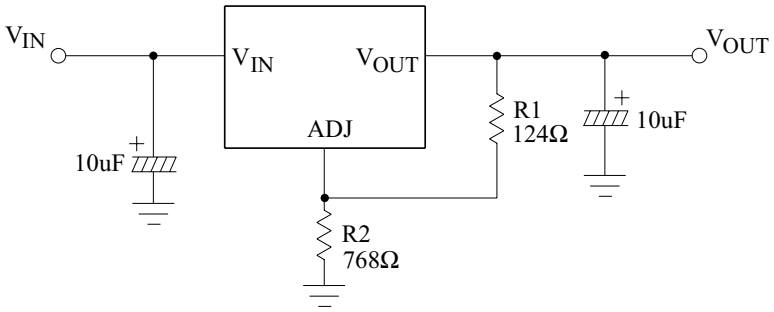


Fig.2 Application Circuit-2 (Adjustable-Type)



$V_{OUT}=V_{REF}\,(1+R2/R1)+I_{ADJ}\bullet R2$

ELECTRICAL CHARACTERISTICS

KIA78Q000PI (Unless otherwise specified, Tj=0~125℃)

CHARACTERISTIC	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Output Voltage	V_{OUT1}	$V_{IN}=V_{OUT}+1.5V$, $I_{OUT}=10mA$, Tj=25℃	1.225	1.25	1.275	V
	V_{OUT2}	$10mA \le I_{OUT} \le 0.8A$, $V_{OUT}+1.5V \le V_{IN} \le 10V$	1.20	1.25	1.30	
Line Regulation	Reg Line	$V_{OUT}+1.5V \le V_{IN} \le 10V$, $I_{OUT}=10mA$	-	1	10	mV
Load Regulation	Reg Load	$10mA \le I_{OUT} \le 0.8A$, $V_{IN}=V_{OUT}+2.0V$	-	15	30	mV
Quiescent Current	I_{B1}	$V_{IN}=V_{OUT}+1.25V$, $I_{OUT}=0A$	-	4.2	10	mA
	I_{B2}	$V_{IN}=10V$, $I_{OUT}=0A$	-	4.2	10	
Adjustable Pin Current	I_{ADJ}	$V_{IN}=V_{OUT}+1.5V$	-	35	-	μA
Minimum Load Current	I_{MIN}	$V_{IN}=V_{OUT}+1.5V$	10	-	-	mA
Output Noise Voltage	V_{NO}	$V_{IN}=V_{OUT}+1.25V$, $I_{OUT}=40mA$, $10Hz \le f \le 10kHz$	-	100	-	μVrms
Sort Circuit Current Limit	I_{SC}	$V_{IN}=V_{OUT}+2.0V$	1.1	-	-	A
Ripple Rejection	R · R	$I_{OUT}=40mA$, f=120Hz, Vripple=1Vp-p $V_{IN}=V_{OUT}+3V$	60	80	-	dB
Dropout Voltage	V_D	$I_{OUT}=0.8A$, $V_{IN}=0.95V_{OUT}$	-	1.1	1.2	V
Temperature Stability	TCV_O	$V_{IN}=V_{OUT}+1.5V$, $I_{OUT}=10mA$	-	0.5	-	%

ELECTRICAL CHARACTERISTICS

KIA78Q015PI (Unless otherwise specified, Tj=0~125℃)

CHARACTERISTIC	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Output Voltage	V_{OUT1}	$V_{IN}=V_{OUT}+1.5V$, $I_{OUT}=10mA$, Tj=25℃	1.47	1.5	1.53	V
	V_{OUT2}	$10mA \leq I_{OUT} \leq 0.8A$, $V_{OUT}+1.5V \leq V_{IN} \leq 10V$	1.44	1.5	1.56	
Line Regulation	Reg Line	$V_{OUT}+1.5V \leq V_{IN} \leq 10V$, $I_{OUT}=10mA$	-	1	10	mV
Load Regulation	Reg Load	$10mA \leq I_{OUT} \leq 0.8A$, $V_{IN}=V_{OUT}+2.0V$	-	15	30	mV
Quiescent Current	I_{B1}	$V_{IN}=V_{OUT}+1.25V$, $I_{OUT}=0A$	-	4.2	10	mA
	I_{B2}	$V_{IN}=10V$, $I_{OUT}=0A$	-	4.2	10	
Output Noise Voltage	V_{NO}	$V_{IN}=V_{OUT}+1.25V$, $I_{OUT}=40mA$, $10Hz \leq f \leq 10kHz$	-	100	-	μVrms
Sort Circuit Current Limit	I_{SC}	$V_{IN}=V_{OUT}+2.0V$	1.1	-	-	A
Ripple Rejection	R · R	$I_{OUT}=40mA$, f=120Hz, Vripple=1Vp-p $V_{IN}=V_{OUT}+3V$	60	80	-	dB
Dropout Voltage	V_D	$I_{OUT}=0.8A$, $V_{IN}=0.95V_{OUT}$	-	1.1	1.2	V
Temperature Stability	TCV_O	$V_{IN}=V_{OUT}+1.5V$, $I_{OUT}=10mA$	-	0.5	-	%

ELECTRICAL CHARACTERISTICS

KIA78Q018PI (Unless otherwise specified, Tj=0~125℃)

CHARACTERISTIC	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Output Voltage	V_{OUT1}	$V_{IN}=V_{OUT}+1.5V$, $I_{OUT}=10mA$, Tj=25℃	1.764	1.8	1.836	V
	V_{OUT2}	$10mA \leq I_{OUT} \leq 0.8A$, $V_{OUT}+1.5V \leq V_{IN} \leq 10V$	1.728	1.8	1.872	
Line Regulation	Reg Line	$V_{OUT}+1.5V \leq V_{IN} \leq 10V$, $I_{OUT}=10mA$	-	1	10	mV
Load Regulation	Reg Load	$10mA \leq I_{OUT} \leq 0.8A$, $V_{IN}=V_{OUT}+2.0V$	-	15	30	mV
Quiescent Current	I_{B1}	$V_{IN}=V_{OUT}+1.25V$, $I_{OUT}=0A$	-	4.2	10	mA
	I_{B2}	$V_{IN}=10V$, $I_{OUT}=0A$	-	4.2	10	
Output Noise Voltage	V_{NO}	$V_{IN}=V_{OUT}+1.25V$, $I_{OUT}=40mA$, $10Hz \leq f \leq 10kHz$	-	100	-	μVrms
Sort Circuit Current Limit	I_{SC}	$V_{IN}=V_{OUT}+2.0V$	1.1	-	-	A
Ripple Rejection	R · R	$I_{OUT}=40mA$, f=120Hz, Vripple=1Vp-p $V_{IN}=V_{OUT}+3V$	60	80	-	dB
Dropout Voltage	V_D	$I_{OUT}=0.8A$, $V_{IN}=0.95V_{OUT}$	-	1.1	1.2	V
Temperature Stability	TCV_O	$V_{IN}=V_{OUT}+1.5V$, $I_{OUT}=10mA$	-	0.5	-	%

ELECTRICAL CHARACTERISTICS

KIA78Q025PI (Unless otherwise specified, Tj=0~125℃)

CHARACTERISTIC	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Output Voltage	V_{OUT1}	$V_{IN}=V_{OUT}+1.5V$, $I_{OUT}=10mA$, Tj=25℃	2.45	2.5	2.55	V
	V_{OUT2}	$10mA \leq I_{OUT} \leq 0.8A$, $V_{OUT}+1.5V \leq V_{IN} \leq 10V$	2.4	2.5	2.6	
Line Regulation	Reg Line	$V_{OUT}+1.5V \leq V_{IN} \leq 10V$, $I_{OUT}=10mA$	-	1	10	mV
Load Regulation	Reg Load	$10mA \leq I_{OUT} \leq 0.8A$, $V_{IN}=V_{OUT}+2.0V$	-	15	30	mV
Quiescent Current	I_{B1}	$V_{IN}=V_{OUT}+1.25V$, $I_{OUT}=0A$	-	4.2	10	mA
	I_{B2}	$V_{IN}=10V$, $I_{OUT}=0A$	-	4.2	10	
Output Noise Voltage	V_{NO}	$V_{IN}=V_{OUT}+1.25V$, $I_{OUT}=40mA$, $10Hz \leq f \leq 10kHz$	-	100	-	μVrms
Sort Circuit Current Limit	I_{SC}	$V_{IN}=V_{OUT}+2.0V$	1.1	-	-	A
Ripple Rejection	R · R	$I_{OUT}=40mA$, f=120Hz, Vripple=1Vp-p $V_{IN}=V_{OUT}+3V$	60	80	-	dB
Dropout Voltage	V_D	$I_{OUT}=0.8A$, $V_{IN}=0.95V_{OUT}$	-	1.1	1.2	V
Temperature Stability	TCV_O	$V_{IN}=V_{OUT}+1.5V$, $I_{OUT}=10mA$	-	0.5	-	%

ELECTRICAL CHARACTERISTICS

KIA78Q028PI (Unless otherwise specified, Tj=0~125℃)

CHARACTERISTIC	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Output Voltage	V_{OUT1}	$V_{IN}=V_{OUT}+1.5V$, $I_{OUT}=10mA$, Tj=25℃	2.793	2.85	2.907	V
	V_{OUT2}	$10mA \leq I_{OUT} \leq 0.8A$, $V_{OUT}+1.5V \leq V_{IN} \leq 10V$	2.736	2.85	2.964	
Line Regulation	Reg Line	$V_{OUT}+1.5V \leq V_{IN} \leq 10V$, $I_{OUT}=10mA$	-	1	10	mV
Load Regulation	Reg Load	$10mA \leq I_{OUT} \leq 0.8A$, $V_{IN}=V_{OUT}+2.0V$	-	15	30	mV
Quiescent Current	I_{B1}	$V_{IN}=V_{OUT}+1.25V$, $I_{OUT}=0A$	-	4.2	10	mA
	I_{B2}	$V_{IN}=10V$, $I_{OUT}=0A$	-	4.2	10	
Output Noise Voltage	V_{NO}	$V_{IN}=V_{OUT}+1.25V$, $I_{OUT}=40mA$, $10Hz \leq f \leq 10kHz$	-	100	-	μVrms
Sort Circuit Current Limit	I_{SC}	$V_{IN}=V_{OUT}+2.0V$	1.1	-	-	A
Ripple Rejection	R · R	$I_{OUT}=40mA$, f=120Hz, Vripple=1Vp-p $V_{IN}=V_{OUT}+3V$	60	80	-	dB
Dropout Voltage	V_D	$I_{OUT}=0.8A$, $V_{IN}=0.95V_{OUT}$	-	1.1	1.2	V
Temperature Stability	TCV_O	$V_{IN}=V_{OUT}+1.5V$, $I_{OUT}=10mA$	-	0.5	-	%

ELECTRICAL CHARACTERISTICS

KIA78Q033PI (Unless otherwise specified, Tj=0~125℃)

CHARACTERISTIC	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Output Voltage	V_{OUT1}	V_{IN}=V_{OUT}+1.5V, I_{OUT}=10mA, Tj=25℃	3.234	3.3	3.366	V
	V_{OUT2}	10mA≤I_{OUT}≤0.8A, V_{OUT}+1.5V≤V_{IN}≤10V	3.168	3.3	3.432	
Line Regulation	Reg Line	V_{OUT}+1.5V≤V_{IN}≤10V, I_{OUT}=10mA	-	1	10	mV
Load Regulation	Reg Load	10mA≤I_{OUT}≤0.8A, V_{IN}=V_{OUT}+2.0V	-	15	30	mV
Quiescent Current	I_{B1}	V_{IN}=V_{OUT}+1.25V, I_{OUT}=0A	-	4.2	10	mA
	I_{B2}	V_{IN}=10V, I_{OUT}=0A	-	4.2	10	
Output Noise Voltage	V_{NO}	V_{IN}=V_{OUT}+1.25V, I_{OUT}=40mA, 10Hz≤f≤10kHz	-	100	-	μVrms
Sort Circuit Current Limit	I_{SC}	V_{IN}=V_{OUT}+2.0V	1.1	-	-	A
Ripple Rejection	R · R	I_{OUT}=40mA, f=120Hz, Vripple=1Vp-p V_{IN}=V_{OUT}+3V	60	80	-	dB
Dropout Voltage	V_D	I_{OUT}=0.8A, V_{IN}=0.95V_{OUT}	-	1.1	1.2	V
Temperature Stability	TCV_O	V_{IN}=V_{OUT}+1.5V, I_{OUT}=10mA	-	0.5	-	%

ELECTRICAL CHARACTERISTICS

KIA78Q050PI (Unless otherwise specified, Tj=0~125℃)

CHARACTERISTIC	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Output Voltage	V_{OUT1}	V_{IN}=V_{OUT}+1.5V, I_{OUT}=10mA, Tj=25℃	4.9	5	5.1	V
	V_{OUT2}	10mA≤I_{OUT}≤0.8A, V_{OUT}+1.5V≤V_{IN}≤10V	4.8	5	5.2	
Line Regulation	Reg Line	V_{OUT}+1.5V≤V_{IN}≤10V, I_{OUT}=10mA	-	1	10	mV
Load Regulation	Reg Load	10mA≤I_{OUT}≤0.8A, V_{IN}=V_{OUT}+2.0V	-	15	30	mV
Quiescent Current	I_{B1}	V_{IN}=V_{OUT}+1.25V, I_{OUT}=0A	-	4.2	10	mA
	I_{B2}	V_{IN}=10V, I_{OUT}=0A	-	4.2	10	
Output Noise Voltage	V_{NO}	V_{IN}=V_{OUT}+1.25V, I_{OUT}=40mA, 10Hz≤f≤10kHz	-	100	-	μVrms
Sort Circuit Current Limit	I_{SC}	V_{IN}=V_{OUT}+2.0V	1.1	-	-	A
Ripple Rejection	R · R	I_{OUT}=40mA, f=120Hz, Vripple=1Vp-p V_{IN}=V_{OUT}+3V	60	80	-	dB
Dropout Voltage	V_D	I_{OUT}=0.8A, V_{IN}=0.95V_{OUT}	-	1.1	1.2	V
Temperature Stability	TCV_O	V_{IN}=V_{OUT}+1.5V, I_{OUT}=10mA	-	0.5	-	%

Fig. 3 V_D - I_{OUT}

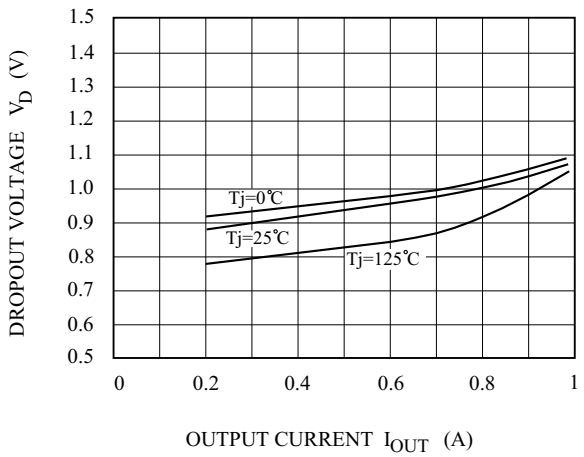


Fig. 4 V_{REF} - T_j

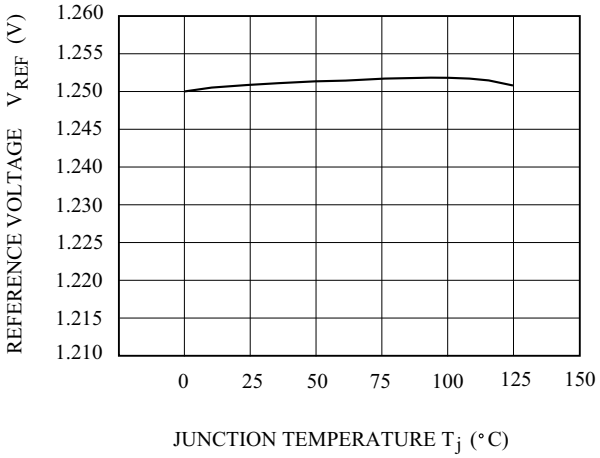


Fig.5 $I_{OUT(MIN)}$ - T_j

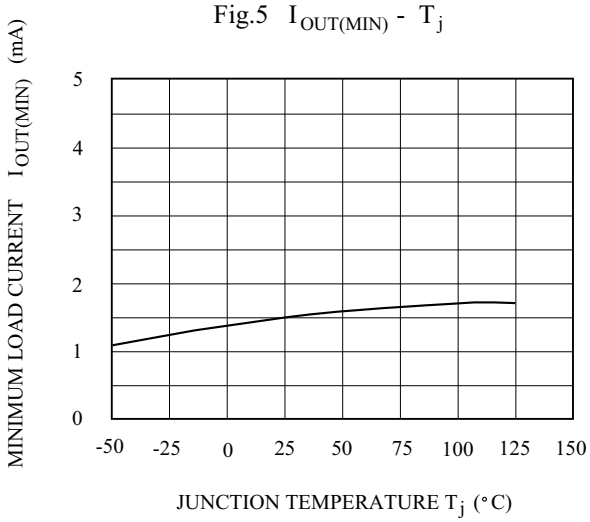


Fig.6 I_{ADJ} - T_j

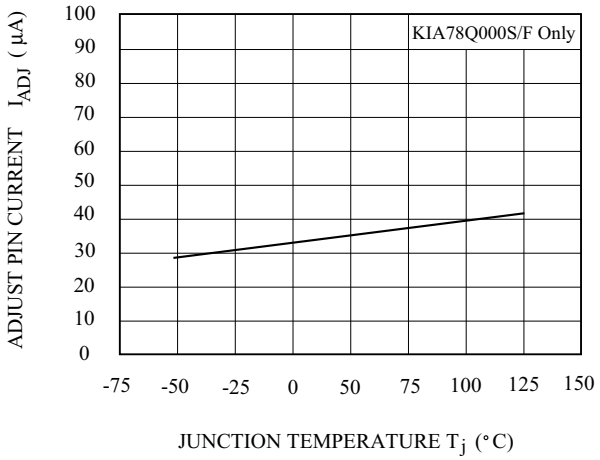


Fig.7 I_{SC} - T_j

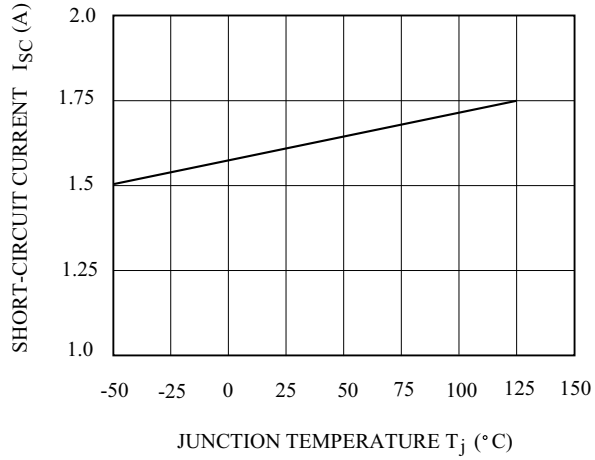


Fig.8 R.R-f

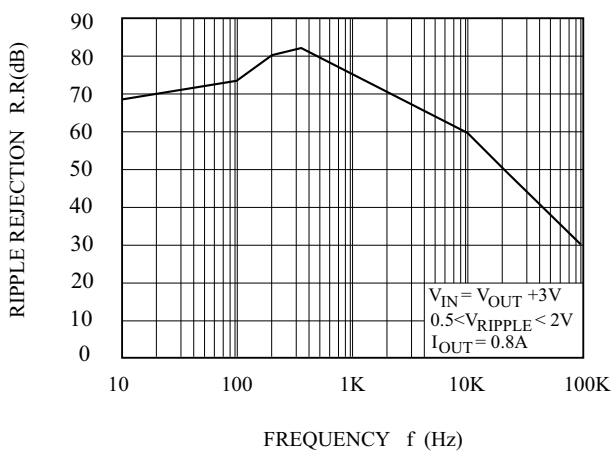
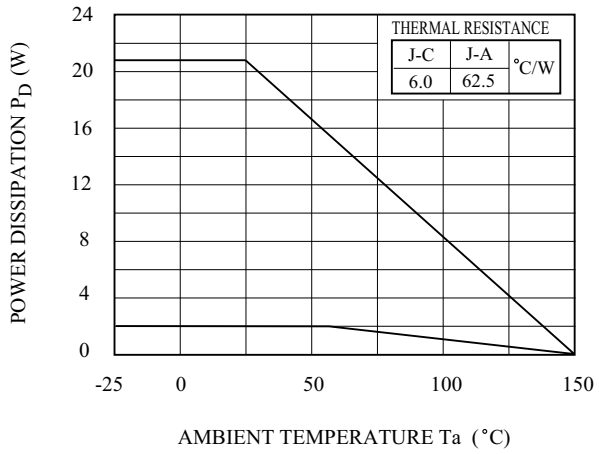


Fig.9 P_D - Ta


THERMAL RESISTANCE
J-C
J-A
°C/W
6.0
62.5
POWER DISSIPATION P_D (W)
24
20
16
12
8
4
0
-25
0
50
100
150
AMBIENT TEMPERATURE Ta (°C)