

1.5A LOW DROP FIXED AND ADJUSTABLE POSITIVE POSITIVE VOLTAGE REGULATOR.

The KIA1578Q*** is a Low Drop Voltage Regulator able to provide up to 1A of output current, available even in adjustable version. (Vref=1.25V)

FEATURES

- Low Dropout Voltage : 1.3V/Typ. (Iout=1.5A)
- Very Low Quiescent Current : 4.2 mA/Typ.
- Output Current up to 1.5A.
- 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 Terminal Limit.
- High Ripple Rejection : 80 dB/Typ.
- Temperature Range : 0 °C~125 °C.

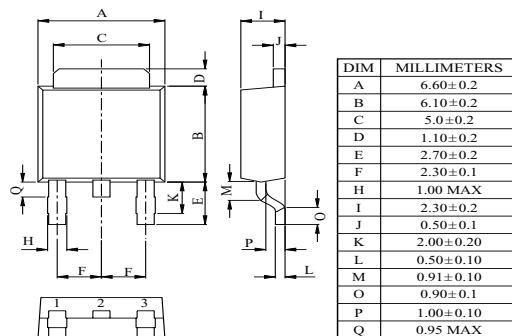
LINE UP

ITEM	OUTPUT VOLTAGE (V)	PACKAGE
* KIA1578Q000F/FP/PI	Adjustable (1.25~10V)	F : DPAK FP : D ² PAK PI : TO-220IS
* KIA1578Q015F/FP/PI	1.5	
KIA1578Q018F/FP/PI	1.8	
KIA1578Q025F/FP/PI	2.5	
* KIA1578Q028F/FP/PI	2.8	
KIA1578Q033F/FP/PI	3.3	
* KIA1578Q050F/FP/PI	5.0	

Note) * : Under development.

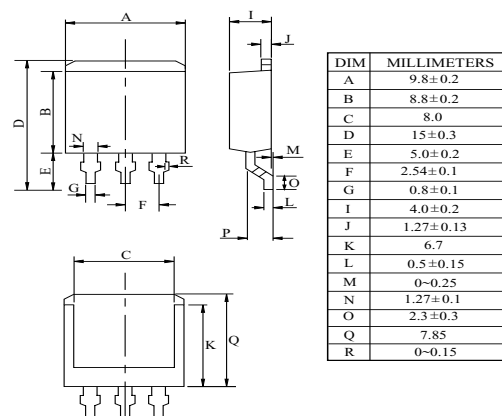
MAXIMUM RATINGS (Ta=25 °C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Input Voltage	V _{IN}	10	V
Output Current	I _{OUT}	1.5	A
Power Dissipation -1 (No Heatsink)	F	1.3	W
	FP	2.0	
	PI	2.0	
Power Dissipation -2 (Infinite Heatsink)	F	13	W
	FP	35	
	PI	20.8	
Operating Junction Temperature	T _{opr}	0~125	°C
Storage Temperature	T _{stg}	-50~150	°C



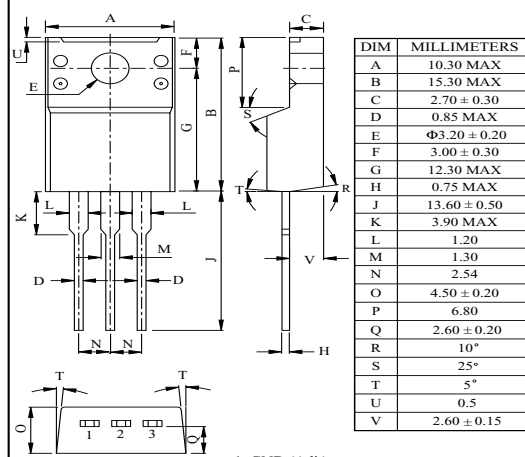
1. GND (Adj.)
2. OUTPUT
3. INPUT
Heat Sink is common to Ⓞ(OUTPUT)

DPAK



1. GND (Adj.)
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D²PAK

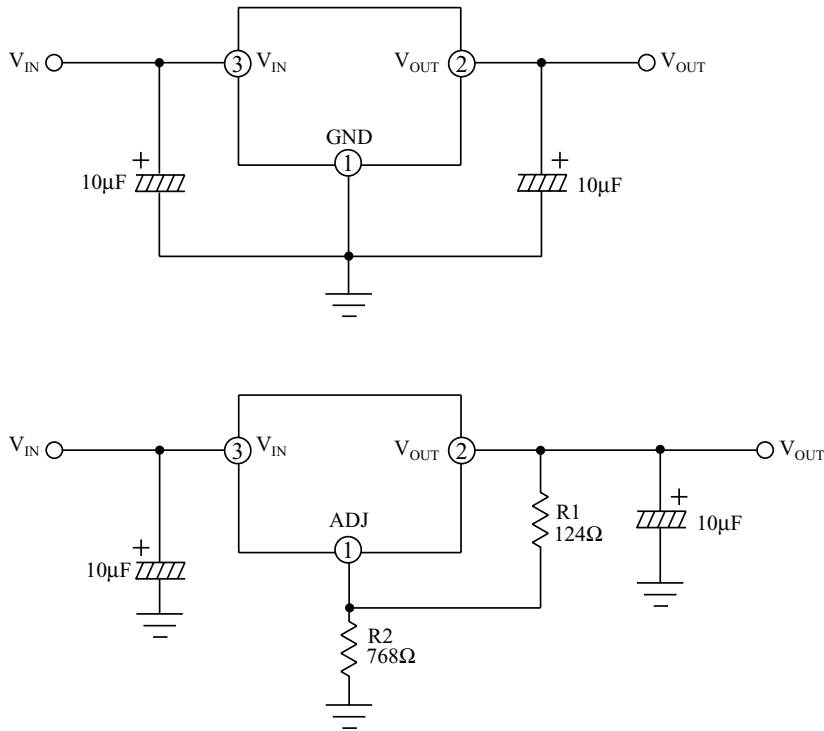


1. GND (Adj.)
2. OUTPUT
3. INPUT

TO-220IS

KIA1578Q000F/FP/PI~ KIA1578Q050F/FP/PI

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



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

ELECTRICAL CHARACTERISTICS

KIA1578Q000 (Unless otherwise specified, $T_j = 0 \sim 125^\circ\text{C}$)

CHARACTERISTIC	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Output Voltage	V_{OUT1}	$V_{IN} = V_{OUT} + 1.5\text{V}$, $I_{OUT} = 10\text{mA}$, $T_j = 25^\circ\text{C}$	1.225	1.25	1.275	V
Line Regulation	Reg Line	$V_{OUT} + 1.5\text{V} \leq V_{IN} \leq 10\text{V}$, $I_{OUT} = 10\text{mA}$	-	1	10	mV
Load Regulation	Reg Load	$10\text{mA} \leq I_{OUT} \leq 1.5\text{A}$, $V_{IN} = V_{OUT} + 2.0\text{V}$	-	15	60	mV
Quiescent Current	I_{B1}	$V_{IN} = V_{OUT} + 1.25\text{V}$, $I_{OUT} = 0\text{A}$	-	4.2	10	mA
	I_{B2}	$V_{IN} = 10\text{V}$, $I_{OUT} = 0\text{A}$	-	4.2	10	mA
Adjustable Pin Current	I_{ADJ}	$V_{IN} = V_{OUT} + 1.5\text{V}$	-	35	-	μA
Minimum Load Current	I_{MIN}	$V_{IN} = V_{OUT} + 1.5\text{V}$	10	-	-	mA
Output Noise Voltage	V_{NO}	$V_{IN} = V_{OUT} + 1.25\text{V}$, $I_{OUT} = 40\text{mA}$, $10\text{Hz} \leq f \leq 10\text{kHz}$	-	100	-	μV_{rms}
Sort Circuit Current Limit	I_{SC}	$V_{IN} = V_{OUT} + 2.0\text{V}$	1.6	-	-	A
Ripple Rejection	$R \cdot R$	$I_{OUT} = 40\text{mA}$, $f = 120\text{Hz}$, $V_{ripple} = 1\text{Vp-p}$, $V_{IN} = V_{OUT} + 3\text{V}$	60	80	-	dB
Dropoout Voltage	V_D	$I_{OUT} = 1.5\text{A}$, $V_{IN} = 0.95V_{OUT}$	-	1.3	1.5	V
Temperature Stability	TCV_O	$V_{IN} = V_{OUT} + 1.5\text{V}$, $I_{OUT} = 10\text{mA}$, $T_a = 0 \sim 125^\circ\text{C}$	-	0.5	-	%

KIA1578Q000F/FP/PI~ KIA1578Q050F/FP/PI

ELECTRICAL CHARACTERISTICS

KIA1578Q015 (Unless otherwise specified, Tj=0~125 °C)

CHARACTERISTIC	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Output Voltage	V _{OUT1}	V _{IN} =V _{OUT} +1.5V, I _{OUT} =10mA, Tj=25 °C	1.47	1.5	1.53	V
Line Regulation	Reg Line	V _{OUT} +1.5V ≤ V _{IN} ≤ 10V, I _{OUT} =10mA	-	1	10	mV
Load Regulation	Reg Load	10mA ≤ I _{OUT} ≤ 1.5A, V _{IN} =V _{OUT} +2.0V	-	15	60	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	mA
Output Noise Voltage	V _{NO}	V _{IN} =V _{OUT} +1.25V, I _{OUT} =40mA, 10Hz ≤ f ≤ 10kHz	-	100	-	μV _{rms}
Sort Circuit Current Limit	I _{SC}	V _{IN} =V _{OUT} +2.0V	1.6	-	-	A
Ripple Rejection	R · R	I _{OUT} =40mA, f=120Hz, V _{ripple} =1Vp-p, V _{IN} =V _{OUT} +3V	60	80	-	dB
Droopout Voltage	V _D	I _{OUT} =1.5A, V _{IN} =0.95V _{OUT}	-	1.3	1.5	V
Temperature Stability	TCV _O	V _{IN} =V _{OUT} +1.5V, I _{OUT} =10mA, Ta=0~125 °C	-	0.5	-	%

ELECTRICAL CHARACTERISTICS

KIA1578Q018 (Unless otherwise specified, Tj=0~125 °C)

CHARACTERISTIC	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Output Voltage	V _{OUT1}	V _{IN} =V _{OUT} +1.5V, I _{OUT} =10mA, Tj=25 °C	1.764	1.8	1.836	V
Line Regulation	Reg Line	V _{OUT} +1.5V ≤ V _{IN} ≤ 10V, I _{OUT} =10mA	-	1	10	mV
Load Regulation	Reg Load	10mA ≤ I _{OUT} ≤ 1.5A, V _{IN} =V _{OUT} +2.0V	-	15	60	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	mA
Output Noise Voltage	V _{NO}	V _{IN} =V _{OUT} +1.25V, I _{OUT} =40mA, 10Hz ≤ f ≤ 10kHz	-	100	-	μV _{rms}
Sort Circuit Current Limit	I _{SC}	V _{IN} =V _{OUT} +2.0V	1.6	-	-	A
Ripple Rejection	R · R	I _{OUT} =40mA, f=120Hz, V _{ripple} =1Vp-p, V _{IN} =V _{OUT} +3V	60	80	-	dB
Droopout Voltage	V _D	I _{OUT} =1.5A, V _{IN} =0.95V _{OUT}	-	1.3	1.5	V
Temperature Stability	TCV _O	V _{IN} =V _{OUT} +1.5V, I _{OUT} =10mA, Ta=0~125 °C	-	0.5	-	%

KIA1578Q000F/FP/PI~ KIA1578Q050F/FP/PI

ELECTRICAL CHARACTERISTICS

KIA1578Q025 (Unless otherwise specified, Tj=0~125 °C)

CHARACTERISTIC	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Output Voltage	V _{OUT1}	V _{IN} =V _{OUT} +1.5V, I _{OUT} =10mA, Tj=25 °C	2.45	2.5	2.55	V
Line Regulation	Reg Line	V _{OUT} +1.5V ≤ V _{IN} ≤ 10V, I _{OUT} =10mA	-	1	10	mV
Load Regulation	Reg Load	10mA ≤ I _{OUT} ≤ 1.5A, V _{IN} =V _{OUT} +2.0V	-	15	60	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	mA
Output Noise Voltage	V _{NO}	V _{IN} =V _{OUT} +1.25V, I _{OUT} =40mA, 10Hz ≤ f ≤ 10kHz	-	100	-	μV _{rms}
Sort Circuit Current Limit	I _{SC}	V _{IN} =V _{OUT} +2.0V	1.6	-	-	A
Ripple Rejection	R · R	I _{OUT} =40mA, f=120Hz, V _{ripple} =1Vp-p, V _{IN} =V _{OUT} +3V	60	80	-	dB
Droopout Voltage	V _D	I _{OUT} =1.5A, V _{IN} =0.95V _{OUT}	-	1.3	1.5	V
Temperature Stability	TCV _O	V _{IN} =V _{OUT} +1.5V, I _{OUT} =10mA, Ta=0~125 °C	-	0.5	-	%

ELECTRICAL CHARACTERISTICS

KIA1578Q028 (Unless otherwise specified, Tj=0~125 °C)

CHARACTERISTIC	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Output Voltage	V _{OUT1}	V _{IN} =V _{OUT} +1.5V, I _{OUT} =10mA, Tj=25 °C	2.793	2.85	2.907	V
Line Regulation	Reg Line	V _{OUT} +1.5V ≤ V _{IN} ≤ 10V, I _{OUT} =10mA	-	1	10	mV
Load Regulation	Reg Load	10mA ≤ I _{OUT} ≤ 1.5A, V _{IN} =V _{OUT} +2.0V	-	15	60	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	mA
Output Noise Voltage	V _{NO}	V _{IN} =V _{OUT} +1.25V, I _{OUT} =40mA, 10Hz ≤ f ≤ 10kHz	-	100	-	μV _{rms}
Sort Circuit Current Limit	I _{SC}	V _{IN} =V _{OUT} +2.0V	1.6	-	-	A
Ripple Rejection	R · R	I _{OUT} =40mA, f=120Hz, V _{ripple} =1Vp-p, V _{IN} =V _{OUT} +3V	60	80	-	dB
Droopout Voltage	V _D	I _{OUT} =1.5A, V _{IN} =0.95V _{OUT}	-	1.3	1.5	V
Temperature Stability	TCV _O	V _{IN} =V _{OUT} +1.5V, I _{OUT} =10mA, Ta=0~125 °C	-	0.5	-	%

KIA1578Q000F/FP/PI~ KIA1578Q050F/FP/PI

ELECTRICAL CHARACTERISTICS

KIA1578Q033 (Unless otherwise specified, $T_j=0\sim 125\text{ }^\circ\text{C}$)

CHARACTERISTIC	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Output Voltage	V_{OUT1}	$V_{IN}=V_{OUT}+1.5V$, $I_{OUT}=10\text{mA}$, $T_j=25\text{ }^\circ\text{C}$	3.234	3.3	3.366	V
Line Regulation	Reg Line	$V_{OUT}+1.5V \leq V_{IN} \leq 10V$, $I_{OUT}=10\text{mA}$	-	1	10	mV
Load Regulation	Reg Load	$10\text{mA} \leq I_{OUT} \leq 1.5A$, $V_{IN}=V_{OUT}+2.0V$	-	15	60	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	mA
Output Noise Voltage	V_{NO}	$V_{IN}=V_{OUT}+1.25V$, $I_{OUT}=40\text{mA}$, $10\text{Hz} \leq f \leq 10\text{kHz}$	-	100	-	μV_{rms}
Sort Circuit Current Limit	I_{SC}	$V_{IN}=V_{OUT}+2.0V$	1.6	-	-	A
Ripple Rejection	$R \cdot R$	$I_{OUT}=40\text{mA}$, $f=120\text{Hz}$, $V_{\text{ripple}}=1\text{Vp-p}$, $V_{IN}=V_{OUT}+3V$	60	80	-	dB
Dropoout Voltage	V_D	$I_{OUT}=1.5A$, $V_{IN}=0.95V_{OUT}$	-	1.3	1.5	V
Temperature Stability	TCV_O	$V_{IN}=V_{OUT}+1.5V$, $I_{OUT}=10\text{mA}$, $T_a=0\sim 125\text{ }^\circ\text{C}$	-	0.5	-	%

ELECTRICAL CHARACTERISTICS

KIA1578Q050 (Unless otherwise specified, $T_j=0\sim 125\text{ }^\circ\text{C}$)

CHARACTERISTIC	SYMBOL	CONDITIONS	MIN.	TYP.	MAX.	UNIT
Output Voltage	V_{OUT1}	$V_{IN}=V_{OUT}+1.5V$, $I_{OUT}=10\text{mA}$, $T_j=25\text{ }^\circ\text{C}$	4.9	5	5.1	V
Line Regulation	Reg Line	$V_{OUT}+1.5V \leq V_{IN} \leq 10V$, $I_{OUT}=10\text{mA}$	-	1	10	mV
Load Regulation	Reg Load	$10\text{mA} \leq I_{OUT} \leq 1.5A$, $V_{IN}=V_{OUT}+2.0V$	-	15	60	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	mA
Output Noise Voltage	V_{NO}	$V_{IN}=V_{OUT}+1.25V$, $I_{OUT}=40\text{mA}$, $10\text{Hz} \leq f \leq 10\text{kHz}$	-	100	-	μV_{rms}
Sort Circuit Current Limit	I_{SC}	$V_{IN}=V_{OUT}+2.0V$	1.6	-	-	A
Ripple Rejection	$R \cdot R$	$I_{OUT}=40\text{mA}$, $f=120\text{Hz}$, $V_{\text{ripple}}=1\text{Vp-p}$, $V_{IN}=V_{OUT}+3V$	60	80	-	dB
Dropoout Voltage	V_D	$I_{OUT}=1.5A$, $V_{IN}=0.95V_{OUT}$	-	1.3	1.5	V
Temperature Stability	TCV_O	$V_{IN}=V_{OUT}+1.5V$, $I_{OUT}=10\text{mA}$, $T_a=0\sim 125\text{ }^\circ\text{C}$	-	0.5	-	%

KIA1578Q000F/FP/PI~ KIA1578Q050F/FP/PI

Fig. 3 $V_D - I_{OUT}$

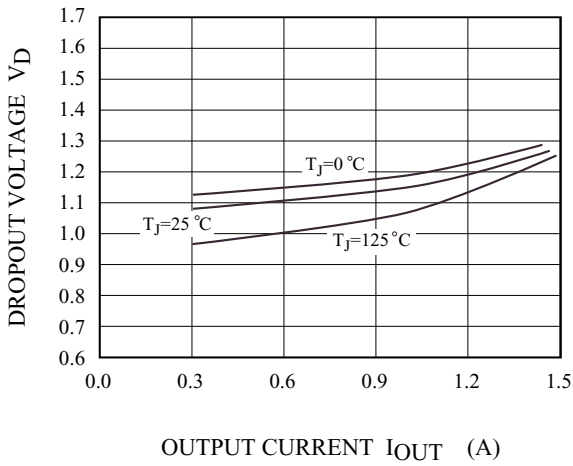


Fig. 4 $V_{REF} - T_J$

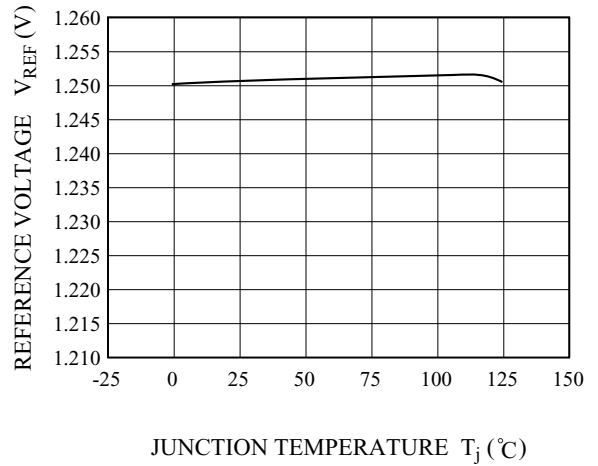


Fig. 5 $I_{OUT(MIN)} - T_J$

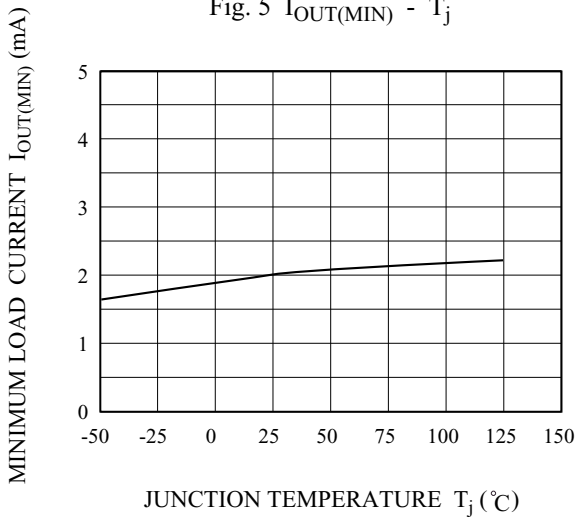


Fig. 6 $I_{ADJ} - T_J$

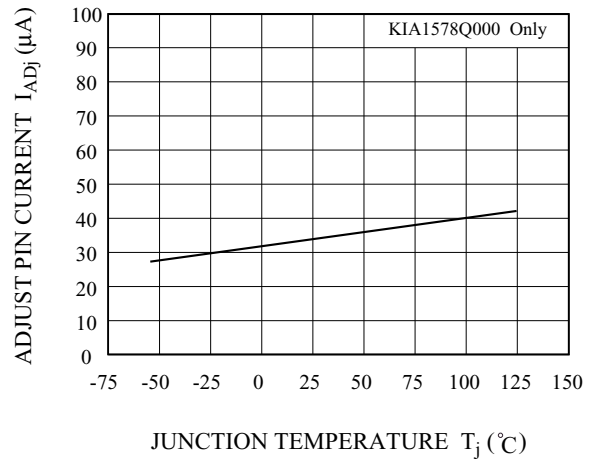


Fig.7 $I_{SC} - T_J$

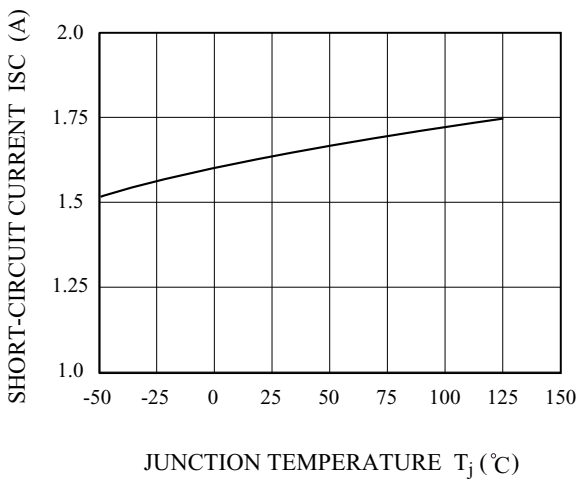
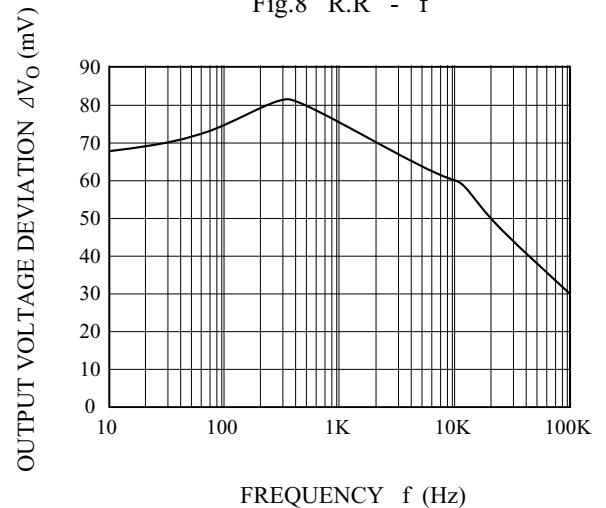


Fig.8 R.R - f



KIA1578Q000F/FP/PI~ KIA1578Q050F/FP/PI

Fig. 9 $P_D - T_a$ (F-Type : DPAK)

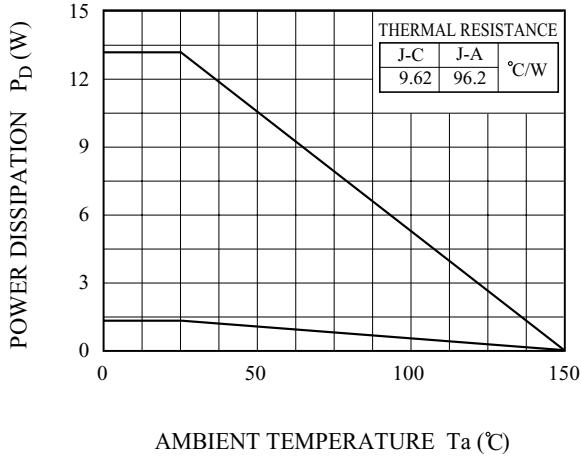


Fig. 10 $P_D - T_a$ (FP-Type : D²PAK)

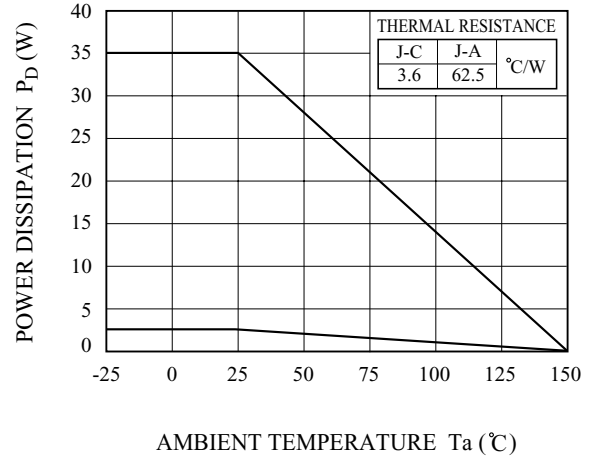


Fig. 11 $P_D - T_a$ (PI-Type : TO-220IS)

