

52kHz 3A Step-Down DC/DC Converter.

The KIA2576 series are monolithic IC that design for a step-down DC/DC converter, and own the ability of driving a 3A load without additional transistor component. Due to reducing the number of external component, the board space can be saved easily.

The external shutdown function can be controlled by logic level and then come into standby mode.

The internal compensation makes feedback control have good line and load regulation without external design. Regarding protected function, thermal shutdown is to prevent over temperature operating from damage, and current limit is against over current operating of the output switch. The KIA2576 series operates at a switching frequency of 52kHz thus allowing smaller sized filter components than what would be needed with lower frequency switching regulators.

FEATURES

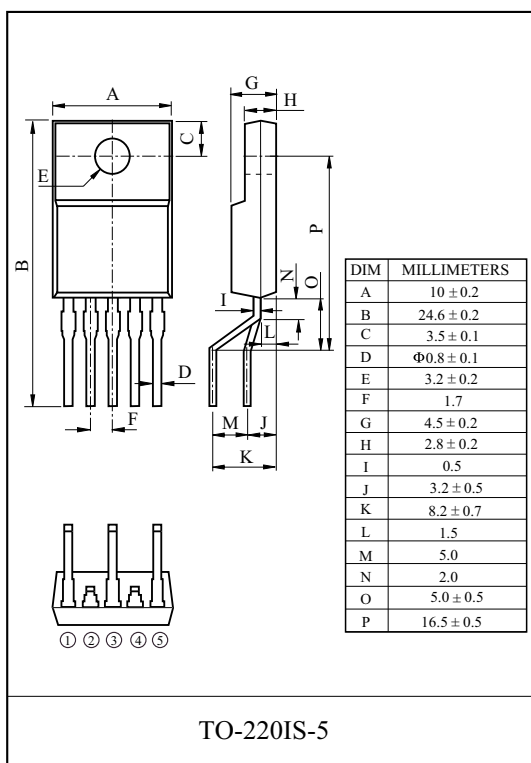
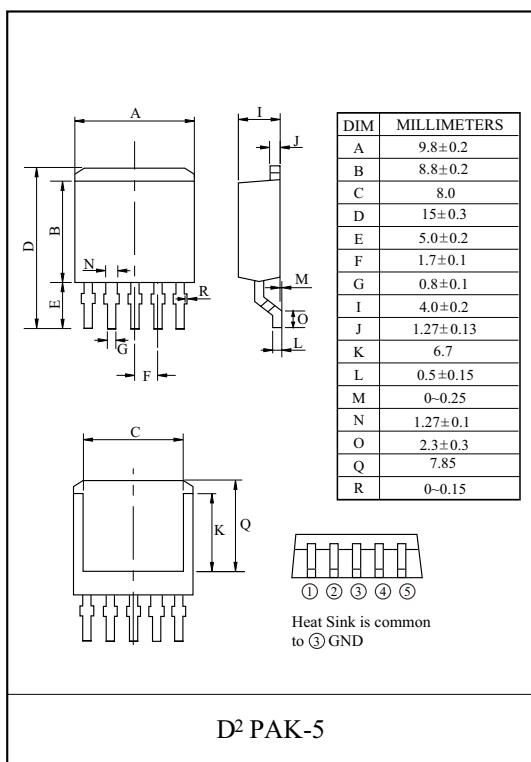
- Output voltage : 3.3V, 5V, 12V and adjustable output version.
- Adjustable version output voltage range, 1.23V to 37V
- 52 KHz fixed switching frequency.
- Voltage mode non-synchronous PWM control.
- Thermal-shutdown and current-limit protection.
- ON/OFF shutdown control input.
- Operating voltage can be up to 40V.
- Output load current. : 3A
- TO-220-5 and D²PAK-5 packages.
- Low power standby mode.

APPLICATION

- Simple High-efficiency step-down regulator.
- On-card switching regulators.
- Positive to negative converter.

LINE UP

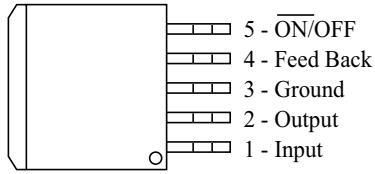
ITEM	OUTPUT VOLTAGE (V)	PACKAGE
KIA2576FP/PI00	Adjustable (1.23~37V)	FP : D ² PAK-5 PI : TO-220IS-5
KIA2576FP/PI33	3.3	
KIA2576FP/PI50	5.0	
KIA2576FP/PI12	12.0	



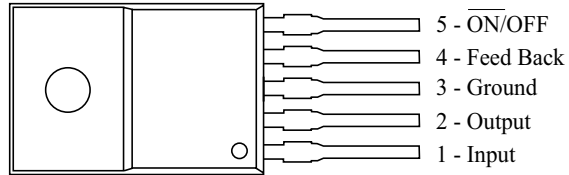
KIA2576FP/PI00 ~ KIA2576FP/PI12

CONNECTION (TOPVIEW)

D²PAK-5 package

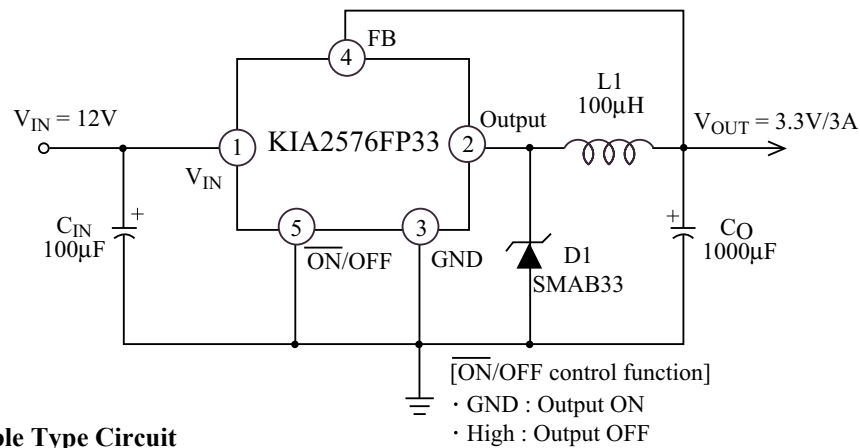


TO-220IS-5 package

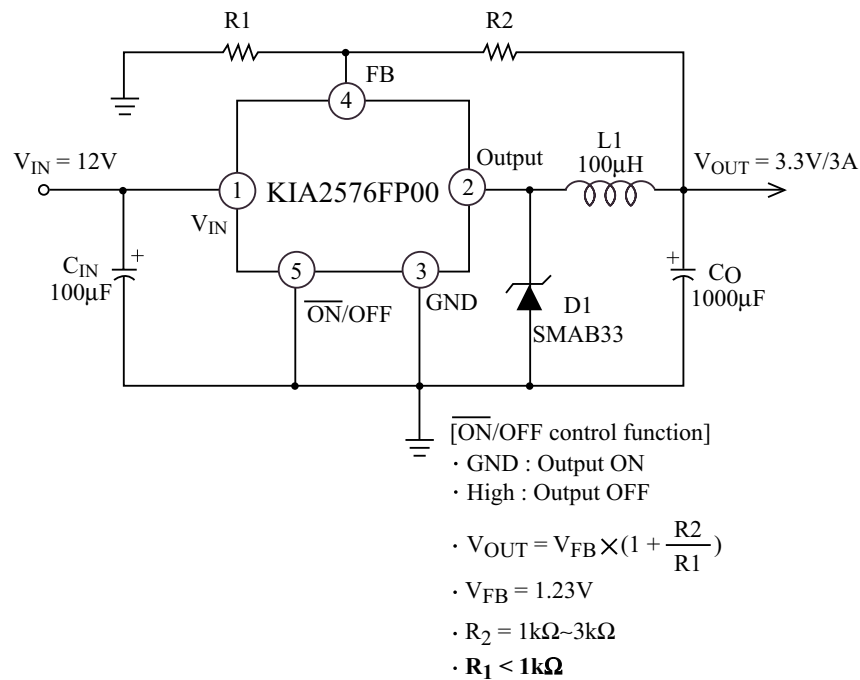


APPLICATION CIRCUIT

(1) Fixed Type Circuit



(2) Adjustable Type Circuit



KIA2576FP/PI00 ~ KIA2576FP/PI12

ABSOLUTE MAXIMUM RATINGS

CHARACTERISTIC		SYMBOL	RATING	UNIT
Supply Voltage		V_{IN}	45	V
ON/OFF Pin input Voltage		$V_{ON/OFF}$	-0.3 ~ +25	V
Feedback Pin Voltage		V_{FB}	-0.3 ~ +25	V
Output Voltage to Ground		V_{OUT}	-1	V
Power Dissipation 1	PI	P_{D1}	1.5	W
	FP		2.0	
Power Dissipation 2	PI	P_{D2}	15	W
	FP		35	
Storage Temperature		T_{stg}	-65 ~ +150	°C
Operating Temperature		T_{opr}	-40 ~ +125	°C
Operating Voltage		V_{opr}	+5 ~ +40	V

ELECTRICAL CHARACTERISTICS

Unless otherwise specified, V_{IN} =12V for 3.3V, 5V, adjustable version and V_{IN} =24V for the 12V version. I_{LOAD} = 0.5A

CHARACTERISTIC		SYMBOL	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Feedback Bias Current		I _{FB}	V _{FB} =1.3V (Adjustable version only)	-	40	60 100	nA
Oscillator Frequency		F _{OSC}	-	47	52	58	kHz
Saturation Voltage		V _{SAT}	I _{OUT} =3A, no outside circuit V _{FB} =0V force driver on	-	1.3	1.4 1.5	V
Max. Duty Cycle (ON)		DC	V _{FB} =0V force driver on	-	100	-	%
Max. Duty Cycle (OFF)			V _{FB} =12V force driver off	-	0	-	
Current Limit		I _{limit}	peak current no outside circuit V _{FB} =0V force driver on	3.6	4.5	6.9	A
Output = 0	Output Leakage Current	I _L	no outside circuit, V _{FB} =12V force driver off	-	-	50	μA
Output = -1			V _{IN} =40V	-	2	30	mA
Quiescent Current		I _Q	V _{FB} =12V force driver off	-	5	10	mA
Standby Quiescent Current		I _{STBY}	ON/OFF pin=5V V _{IN} =40V	-	300	500 600	μA
ON/OFF pin Logic Input Threshold Voltage		V _{IL}	Low (regulator ON)	-	1.3	0.6	V
		V _{IH}	High (regulator OFF)	2.0		-	
ON/OFF Pin Logic Input Current		I _H	V _{LOGIC} =2.5V (OFF)	-	5	15	μA
ON/OFF Pin Input Current		I _L	V _{LOGIC} =0.5V (ON)	-	0.02	5	

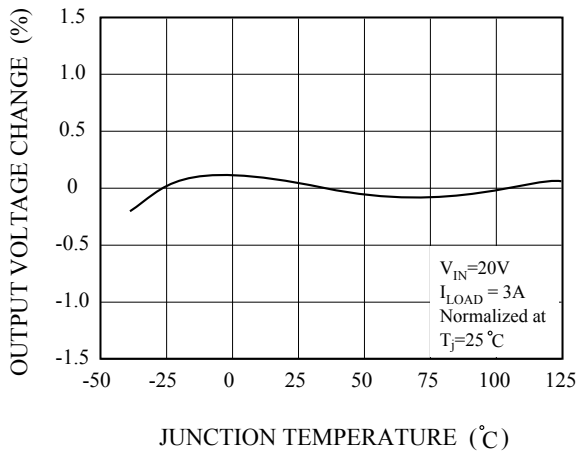
ELECTRICAL CHARACTERISTICS

CHARACTERISTIC		SYMBOL	TEST CONDITION	TYP.	LIMIT	UNIT
Output Feedback	KIA2576FP/PI00	V_{FB}	$5V < V_{IN} < 40V$, $0.2A \leq I_{LOAD} \leq 3A$ V_{OUT} programmed for 3V	1.23	1.193/1.18 1.267/1.28	V V_{MIN} V_{MAX}
Efficiency		η	V_{IN} = 12V, I_{LOAD} =3A	73	-	%
Output Voltage	KIA2576FP/PI33	V_{OUT}	$5V < V_{IN} < 40V$, $0.2A \leq I_{LOAD} \leq 3A$	3.3	3.168/3.135 3.432/3.465	V V_{MIN} V_{MAX}
Efficiency		η	V_{IN} = 12V, I_{LOAD} =3A	73	-	%
Output Voltage	KIA2576FP/PI50	V_{OUT}	$7.5V < V_{IN} < 40V$, $0.2A \leq I_{LOAD} \leq 3A$	5	4.8/4.75 5.2/5.25	V V_{MIN} V_{MAX}
Efficiency		η	V_{IN} =12V, I_{LOAD} =3A	80	-	%
Output Voltage	KIA2576FP/PI12	V_{OUT}	$15V < V_{IN} < 40V$, $0.2A \leq I_{LOAD} \leq 3A$	12	11.52/11.4 12.48/12.6	V V_{MIN} V_{MAX}
Efficiency		η	V_{IN} =15V, I_{LOAD} =3A	90	-	%

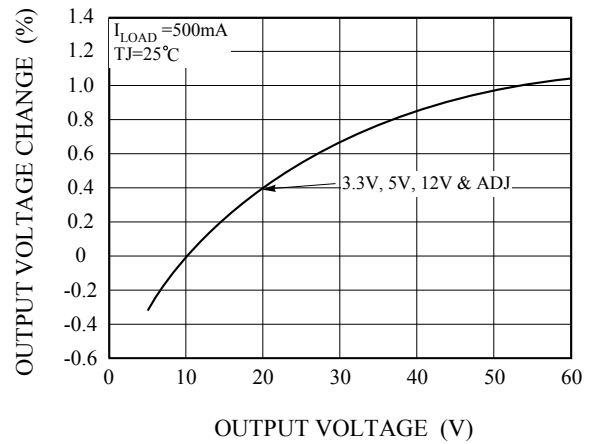
Specifications with boldface type are for full operating temperature range, the other type are for T_j =25 °C

KIA2576FP/PI00 ~ KIA2576FP/PI12

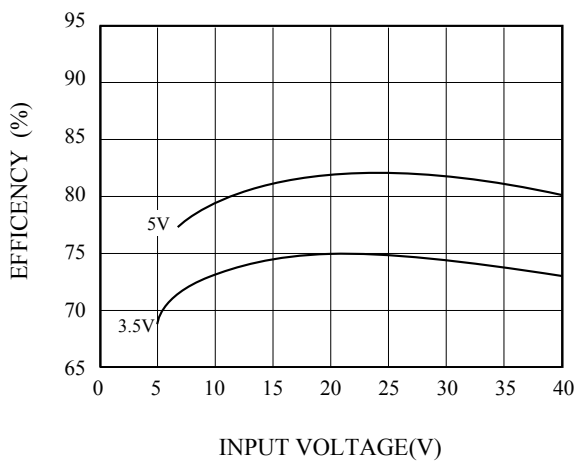
NORMALIZED OUTPUT VOLTAGE



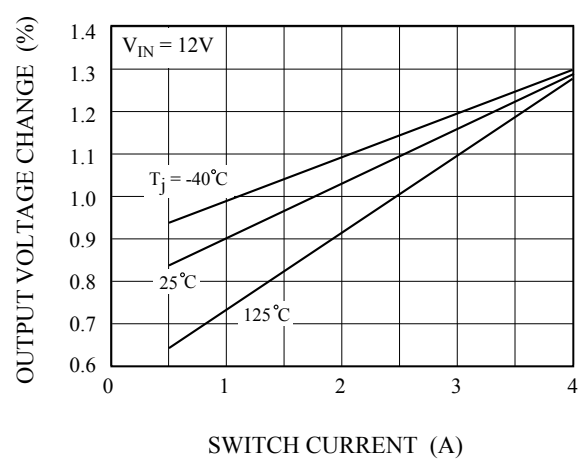
LINE REGULATION



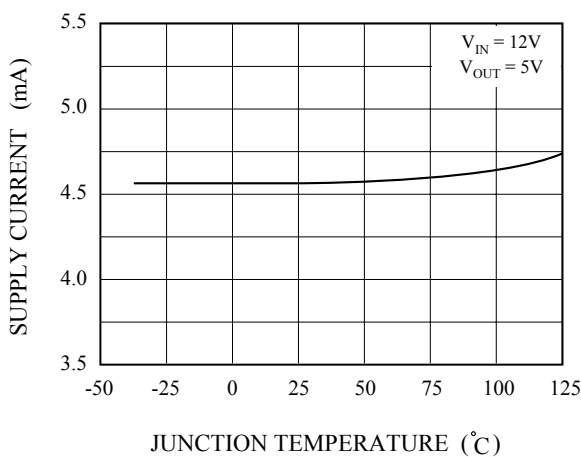
EFFICIENCY



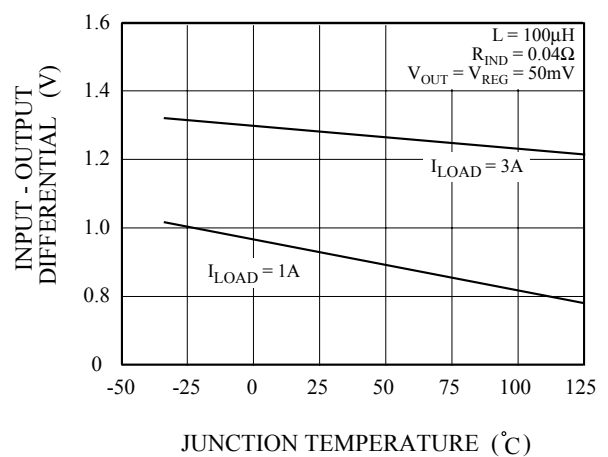
SWITCH SATURATION VOLTAGE



SWITCH CURRENT LIMIT

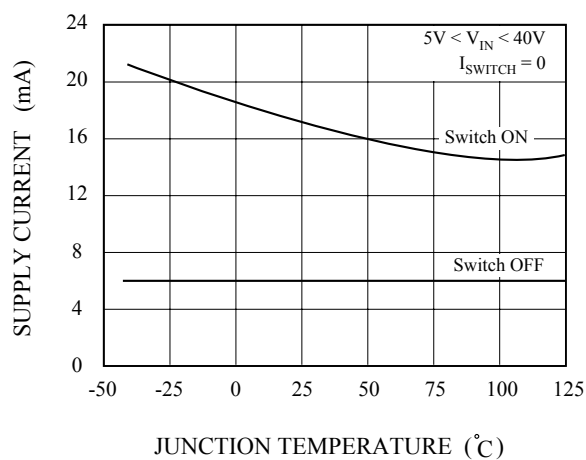


DROPOUT VOLTAGE

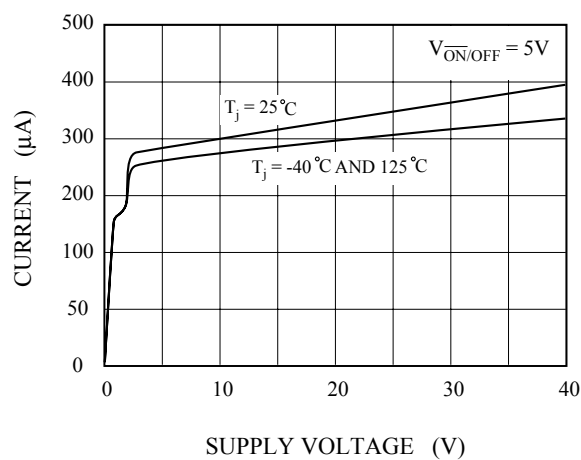


KIA2576FP/PI00 ~ KIA2576FP/PI12

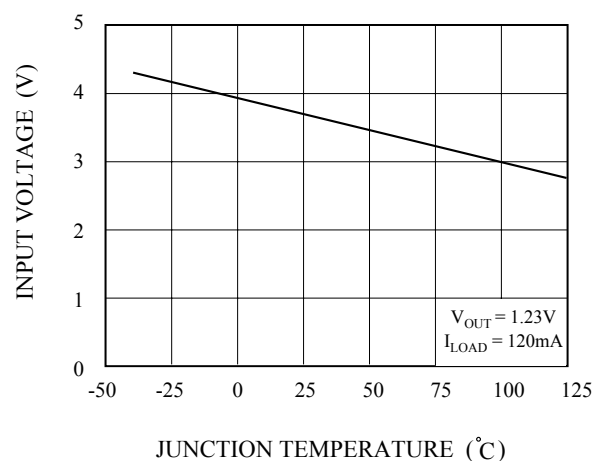
OPERATING QUIESCENT CURRENT



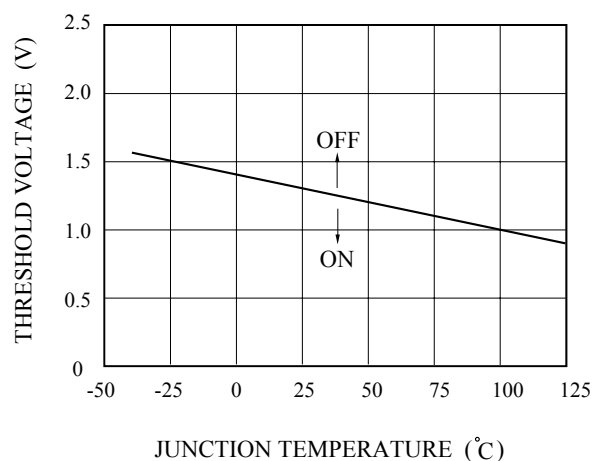
SHUTDOWN QUIESCENT CURRENT



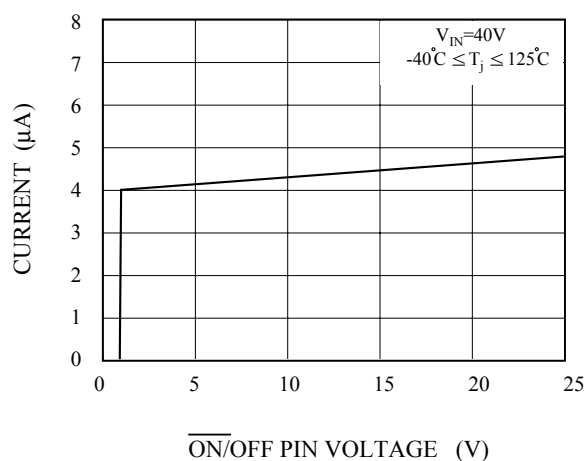
MINIMUM OPERATING VOLTAGE



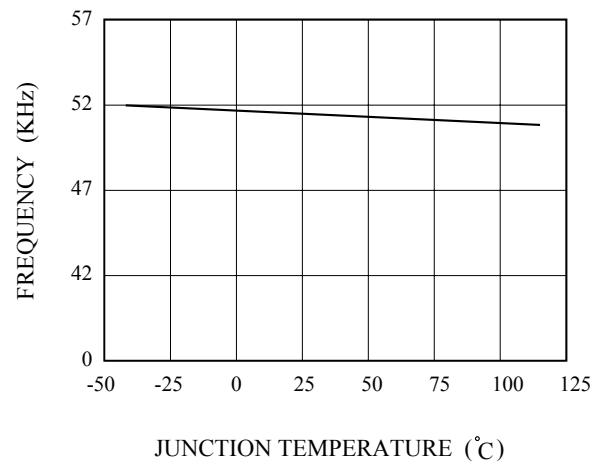
ON/OFF THRESHOLD VOLTAGE



ON/OFF PIN CURRENT (SINKING)

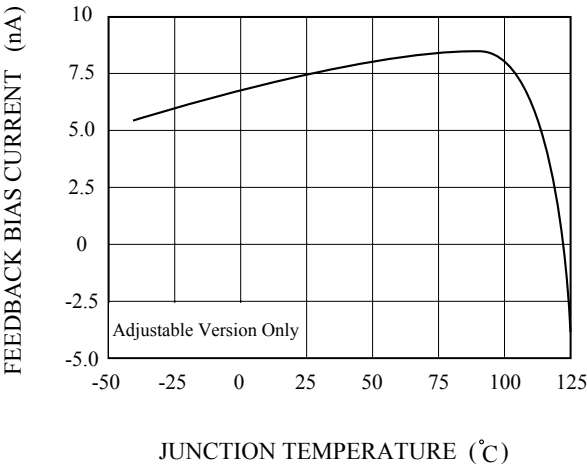


SWITCHING FREQUENCY

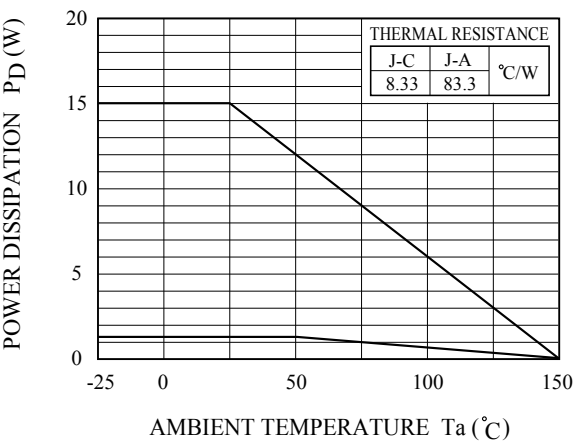


KIA2576FP/PI00 ~ KIA2576FP/PI12

FEEDBACK PIN BIAS CURRENT



POWER DISSIPATION-1 (TO-220IS-5)



POWER DISSIPATION-2 (D²PAK-5)

