

5A LOW DROPOUT POSITIVE REGULATOR

Features

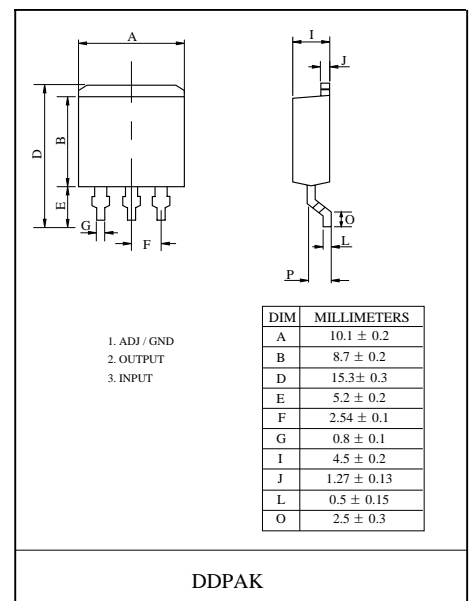
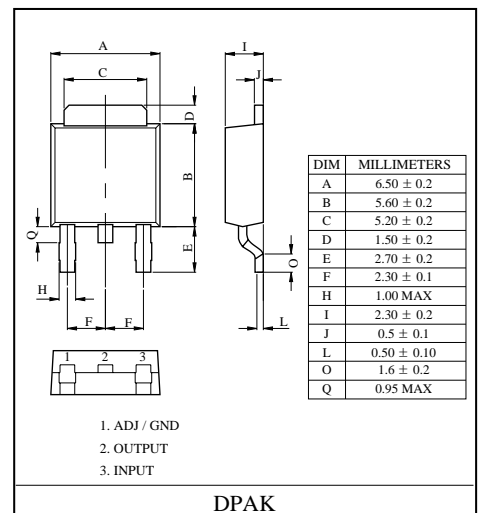
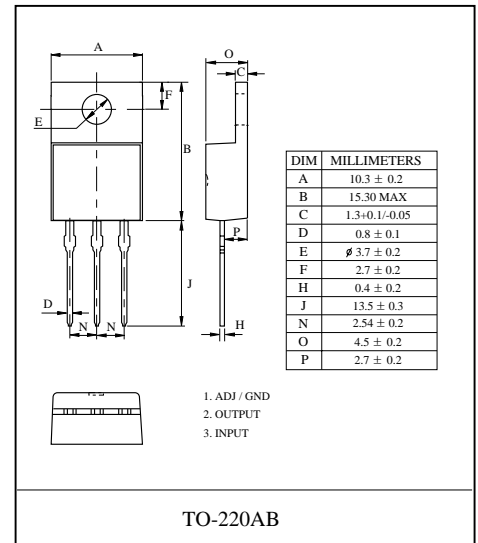
- Output Current : 5A
- Maximum Input Voltage : 12V
- Adjustable Output Voltage or Fixed
- 1.5V, 1.8V, 2.5V, 2.85V, 3.3V, 3.6V, 5.0V
- Current Limiting and Thermal Protection
- Standard 3-Pin Power Packages

Application

- Post Regulator for Switching DC/DC Converter
- High Efficiency Linear Regulators
- Battery Charger

Absolute Maximum Ratings

CHARACTERISTIC	SYMBOL	RATING	UNIT
DC Input Voltage	VI	12	V
Storage Temperature Range	T _{stg}	-65 to +150	°C
Operating Junction Temperature Range (Note 3)	Top	-10 to +125	°C
Thermal Resistance	TO-220AB	50	°C/W
	DDPAK	62.5	
	DPAK	100	





FR1084P/D/DD-XX

ELECTRICAL CHARACTERISTICS

Typicals and limits appearing in normal type apply for $T_j = +25^\circ\text{C}$.

Limits appearing in **Boldface** type apply over the entire junction temperature range for operation.

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN. (Note 5)	TYP. (Note 4)	MAX. (Note 5)	UNIT	
Line Regulation (Note 7)	ΔV_{OUT}	FR1084-Adj	$I_{OUT} = 10\text{mA}, 2.75\text{V} \leq V_{IN} \leq 10\text{V}$	-	-	0.3 0.4	%
		FR1084-1.5	$I_{OUT} = 10\text{mA}, 3.0\text{V} \leq V_{IN} \leq 10\text{V}$	-	-	6 10	mV
		FR1084-1.8	$I_{OUT} = 10\text{mA}, 3.3\text{V} \leq V_{IN} \leq 10\text{V}$	-	-	6 10	
		FR1084-2.5	$I_{OUT} = 10\text{mA}, 4.0\text{V} \leq V_{IN} \leq 10\text{V}$	-	-	6 10	
		FR1084-2.85	$I_{OUT} = 10\text{mA}, 4.35\text{V} \leq V_{IN} \leq 10\text{V}$	-	-	6 10	
		FR1084-3.3	$I_{OUT} = 10\text{mA}, 4.8\text{V} \leq V_{IN} \leq 10\text{V}$	-	-	6 10	
		FR1084-3.6	$I_{OUT} = 10\text{mA}, 5.1\text{V} \leq V_{IN} \leq 10\text{V}$	-	-	6 10	
		FR1084-5.0	$I_{OUT} = 10\text{mA}, 6.5\text{V} \leq V_{IN} \leq 10\text{V}$	-	-	6 10	
Load Regulation (Note 7)	ΔV_{OUT}	FR1084-Adj	$V_{IN} = 4.25\text{V}, 0 \leq I_{OUT} \leq I_{FULL\ LOAD}$	-	-	0.3 0.4	%
		FR1084-1.5 FR1084-1.8 FR1084-2.5 FR1084-2.85	$V_{IN} = 5.0\text{V}, 0 \leq I_{OUT} \leq I_{FULL\ LOAD}$	-	-	12 20	mV
		FR1084-3.3	$V_{IN} = 5.0\text{V}, 0 \leq I_{OUT} \leq I_{FULL\ LOAD}$	-	-	15 20	
		FR1084-3.6	$V_{IN} = 5.3\text{V}, 0 \leq I_{OUT} \leq I_{FULL\ LOAD}$	-	-	15 25	
		FR1084-5.0	$V_{IN} = 8.0\text{V}, 0 \leq I_{OUT} \leq I_{FULL\ LOAD}$	-	-	20 35	
Dropout Voltage (Note 8)	ΔV		$\Delta V_{REF} = 1\%, I_{OUT} = 5\text{A}$	-	-	1.5	V
Minimum Load Current	$I_{O(MIN)}$		$V_{IN} = 10\text{V}$	-	-	10	mA
Current Limit	I_{LIMIT}		$V_{IN} = 6.25\text{V}$	5.5	-	-	A
Adjust Pin Current	I_{ADJ}		$V_{IN} = 2.75 \sim 10\text{V}, I_{OUT} = 10\text{mA}$	-	-	120	μA
Adjust Pin Current Change	ΔI_{ADJ}		$I_{OUT} = 10\text{mA} \sim 5\text{A}, V_{IN} = 2.75 \div 10\text{V}$	-	-	5	μA
Ripple Rejection	RR		$f_{RIPPLE} = 120\text{Hz}, C_{OUT} = 25\mu\text{F}$ Tantalum, $I_{OUT} = 5\text{A}; V_{IN} = 4.25\text{V}$	60	-	-	dB
Temperature Stability	S			-	0.5	-	%

NOTES 1 : Rating indicate conditions for which the device is intended to functional, but specific performance is not Guaranteed.

For guaranteed specification and the test conditions, see the Electrical Characteristics.

NOTES 2 : Power dissipations is kept in a safe range by current limiting circuitry. Refer to Overload Recovery in Application Notes.

NOTES 3 : The maximum power dissipation is a function of $T_{j(MAX)}$, θ_{ja} and T_A . The maximum allowable power dissipation at ambient Temperature is $P_D = (T_{j(MAX)} - T_A) \theta_{ja}$.

NOTES 4 : Typical Values represent the most likely parametric norm.

NOTES 5 : All limits are guaranteed by testing or statistical analysis.

NOTES 6 : $I_{FULL\ LOAD}$ is define in the current limit curves. The $I_{FULL\ LOAD}$ curve defines the current limit as function.

NOTES 7 : Load and Line regulation are measured at constant junction temperature, and are guaranteed up to the maximum power dissipation of 30W. Power dissipation is determined by the input/output differential and the output current. Guaranteed maximum power dissipation will not be available over the full input/output range.

NOTES 8 : Dropout voltage is specified over the full output current range of the device.

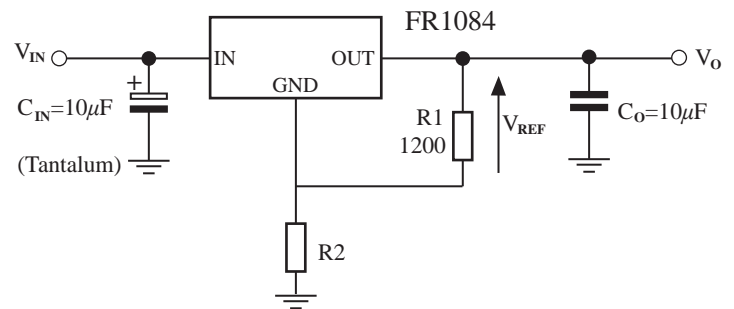
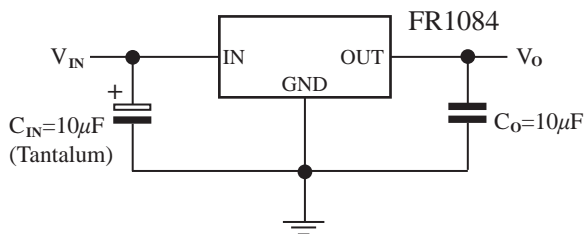
ELECTRICAL CHARACTERISTICS

Typicals and limits appearing in normal type apply for $T_j = +25^\circ\text{C}$.

Limits appearing in **Boldface** type apply over the entire junction temperature range for operation.

CHARACTERISTIC	SYMBOL	TEST CONDITION	MIN. (Note 5)	TYP. (Note 4)	MAX. (Note 5)	UNIT
Output Voltage	V_{OUT}	FR1084-Adj $I_{\text{OUT}} = 10\text{mA}, V_{\text{IN}} = 4.25\text{V}$ $0 \leq I_{\text{OUT}} \leq I_{\text{FULL LOAD}}, 2.75\text{V} \leq V_{\text{IN}} \leq 10\text{V}$	1.237	1.250	1.263	V
			1.232	1.250	1.268	
			1.225	1.250	1.275	
		FR1084-1.5 $I_{\text{OUT}} = 10\text{mA}, V_{\text{IN}} = 4.5\text{V}$ $0 \leq I_{\text{OUT}} \leq I_{\text{FULL LOAD}}, 3.0\text{V} \leq V_{\text{IN}} \leq 10\text{V}$	1.485	1.500	1.515	
			1.478	1.500	1.522	
			1.470	1.500	1.530	
		FR1084-1.8 $I_{\text{OUT}} = 10\text{mA}, V_{\text{IN}} = 4.8\text{V}$ $0 \leq I_{\text{OUT}} \leq I_{\text{FULL LOAD}}, 3.3\text{V} \leq V_{\text{IN}} \leq 10\text{V}$	1.782	1.800	1.818	
			1.773	1.800	1.827	
1.764	1.800		1.836			
FR1084-2.5 $I_{\text{OUT}} = 10\text{mA}, V_{\text{IN}} = 5.5\text{V}$ $0 \leq I_{\text{OUT}} \leq I_{\text{FULL LOAD}}, 4.0\text{V} \leq V_{\text{IN}} \leq 10\text{V}$	2.475	2.500	2.525			
	2.463	2.500	2.537			
	2.450	2.500	2.550			
FR1084-2.85 $I_{\text{OUT}} = 10\text{mA}, V_{\text{IN}} = 5.85\text{V}$ $0 \leq I_{\text{OUT}} \leq I_{\text{FULL LOAD}}, 4.35\text{V} \leq V_{\text{IN}} \leq 10\text{V}$	2.820	2.850	2.880			
	2.805	2.850	2.895			
	2.790	2.850	2.910			
FR1084-3.3 $I_{\text{OUT}} = 10\text{mA}, V_{\text{IN}} = 6.3\text{V}$ $0 \leq I_{\text{OUT}} \leq I_{\text{FULL LOAD}}, 4.8\text{V} \leq V_{\text{IN}} \leq 10\text{V}$	3.270	3.300	3.330			
	3.250	3.300	3.350			
	3.235	3.300	3.365			
FR1084-3.6 $I_{\text{OUT}} = 10\text{mA}, V_{\text{IN}} = 6.6\text{V}$ $0 \leq I_{\text{OUT}} \leq I_{\text{FULL LOAD}}, 5.1\text{V} \leq V_{\text{IN}} \leq 10\text{V}$	3.564	3.600	3.636			
	3.546	3.600	3.654			
	3.528	3.600	3.672			
FR1084-5.0 $I_{\text{OUT}} = 10\text{mA}, V_{\text{IN}} = 8.0\text{V}$ $0 \leq I_{\text{OUT}} \leq I_{\text{FULL LOAD}}, 6.5\text{V} \leq V_{\text{IN}} \leq 10\text{V}$	4.950	5.000	5.050			
	4.925	5.000	5.075			
	4.900	5.000	5.100			

Application Circuit

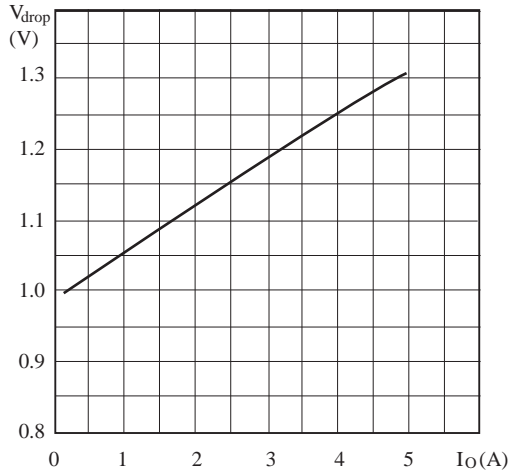


$$V_{\text{O}} = V_{\text{REF}} \left(1 + \frac{R_2}{R_1} \right)$$

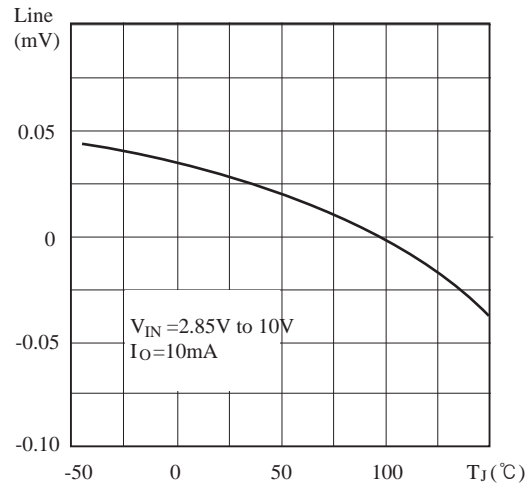
TYPICAL CHARACTERISTICS

(unless otherwise specified $T_J = 25^\circ\text{C}$, $C_1 = 10\mu\text{F}$ (tant.), $C_0 = 10\mu\text{F}$ (tant.))

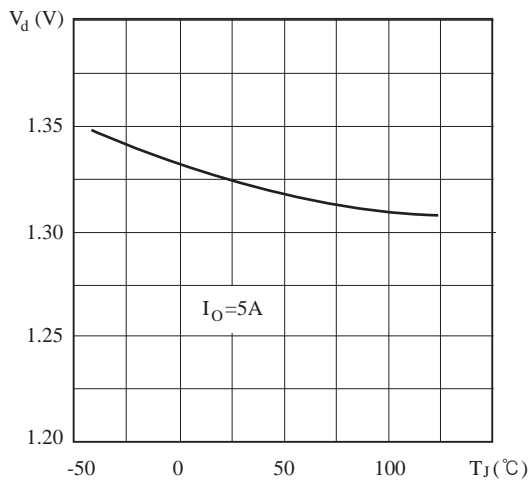
Dropout Voltage vs Output Current



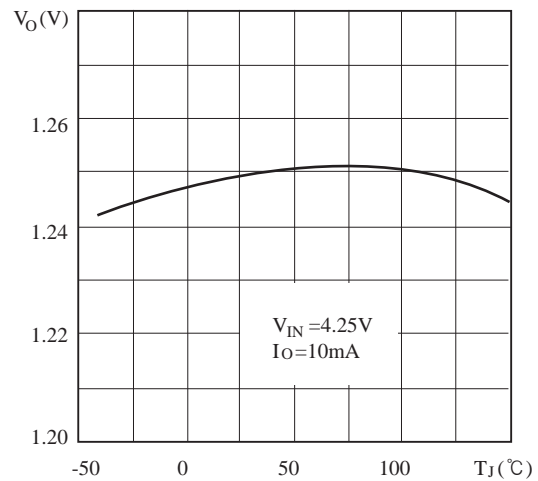
Line Regulation vs Temperature



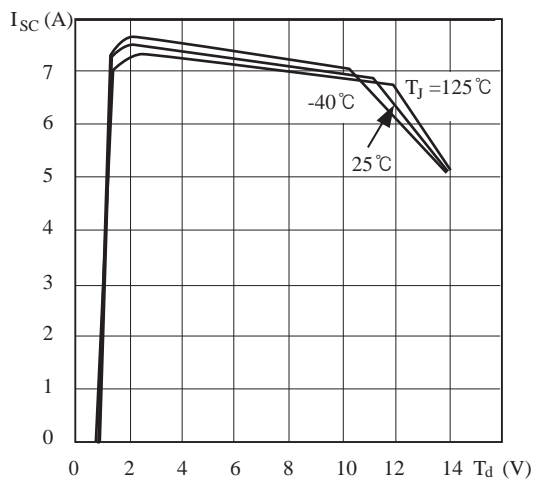
Dropout Voltage vs Temperature



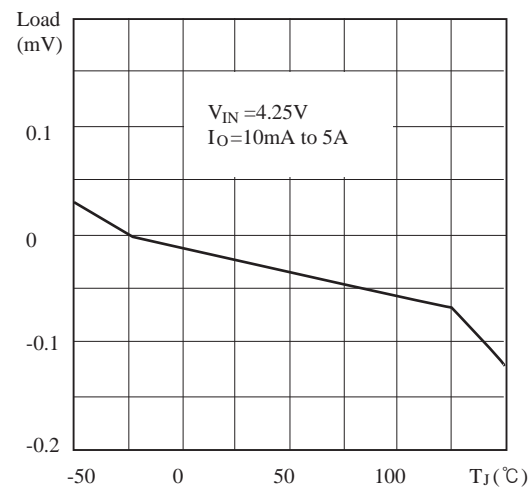
Output Voltage vs Temperature



Short Circuit Current vs Dropout Voltage



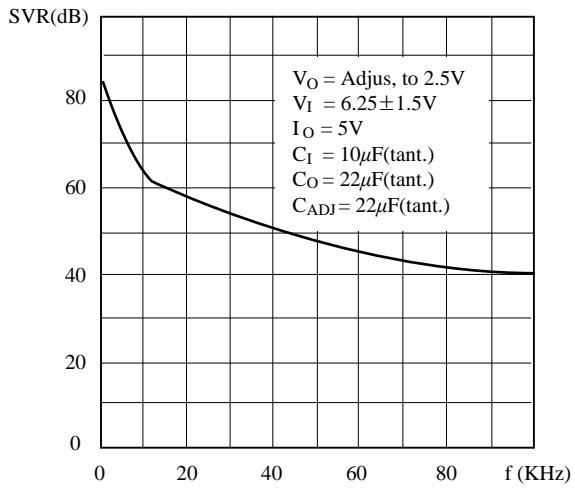
Load Regulation vs Temperature





TYPICAL CHARACTERISTICS

Supply Voltage Rejection vs Frequency



Adjust Pin Current vs Output Current

