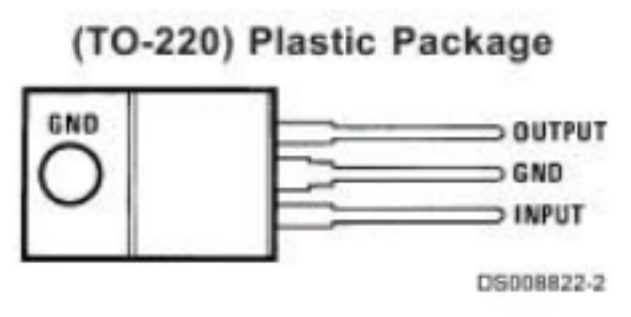
LM2940-5.0 低压差三端稳压芯片（国产）

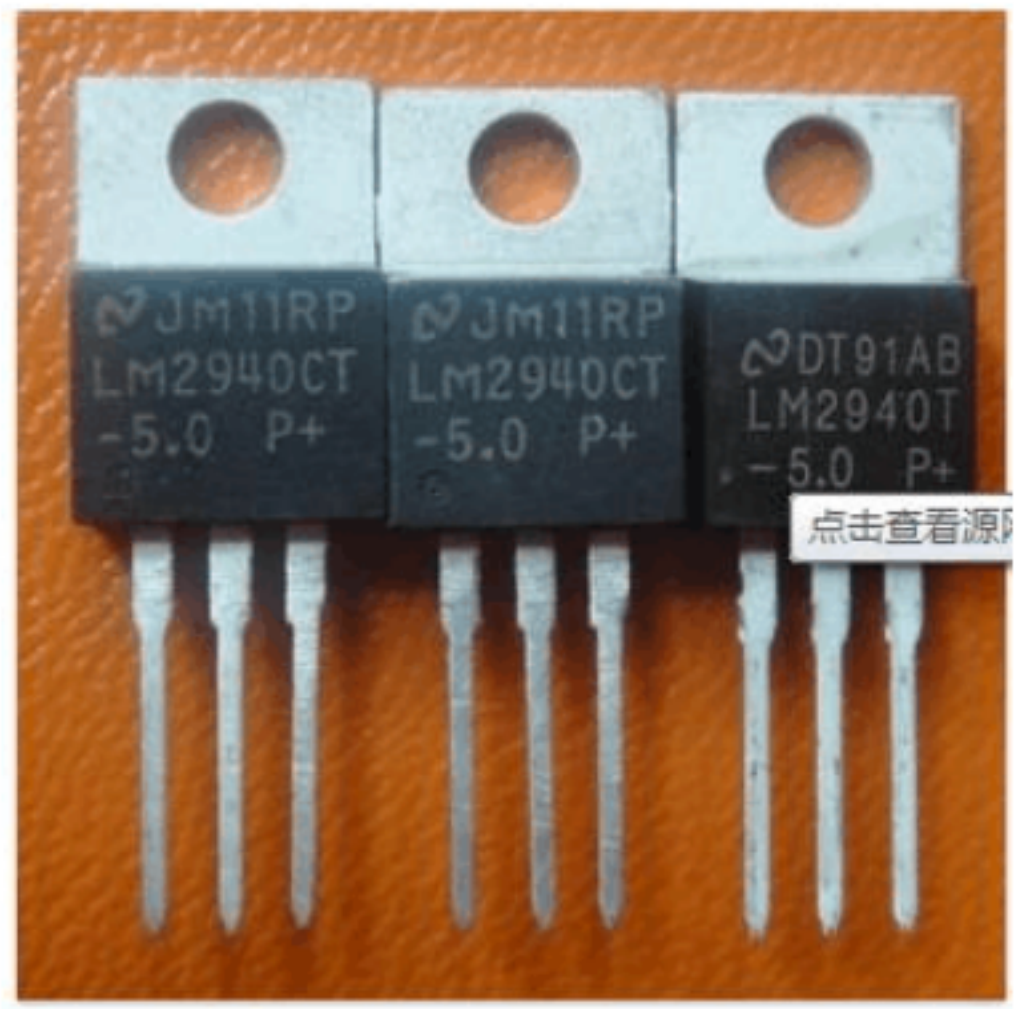
型号： LM2940-5.0P+

封装： TO-220

输出电压固定的低压差三端稳压器；输出电压 5V；输出电流 1A；输出电流 1A 时， 最小输入输出电压差小于 0.8V ；最大输入电压 26V；工作温度 -40 ～+125℃；内含静态电流降低电路、电流限制、过热保护、电池反接和反插入保护电路。

当把一个高些的电压接入芯片时，从 input 接入，从 gnd 接出。 Output 就能输出 5V 电压





LM2940引脚图

For LM2940-5.0V

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	6.25V ≤ V_{IN} ≤ 26V, 5mA ≤ I_{OUT} ≤ 1A	4.85	5.00	5.15	V
Line Regulation	⊥ V_{OUT}	V_{OUT}+2V ≤ V_{IN} ≤ 26V, I_{OUT}=5mA		20	50	mV
Load Regulation	⊥ V_{OUT}	50mA ≤ I_{OUT} ≤ 1A		35	50	mV
Output Impedance	Ro	100 mA DC and 20mArms, fo=120Hz		35		mΩ
Quiescent Current	I_Q	V_{OUT}+2V ≤ V_{IN} ≤ 26V, I_{OUT}=5mA		10	15	mA
Output Noise Voltage	eN	10Hz-100kHz, I_{OUT}=5mA		150		μVrms
Ripple Rejection	RR	fo=120Hz, 1Vrms, I_{OUT}=100mA	60	72		dB
Long Term Stability				20		mV/ 1000Hr
Dropout Voltage	V_D	I_{OUT}=1A		0.5	0.8	V
		I_{OUT}=100mA		0.11	0.15	
Short Circuit Current	I_{SC}	(Note)	1.6	1.9		A
Maximum Line Transient	T_{IN}	Ro=100Ω, T ≤ 100ms	60	75		V
Reverse Polarity DC Input Voltage	V_{RIN}	Ro=100Ω	-15	-30		V
Reverse Polarity Transient Input Voltage	V_{TRRI}	Ro=100Ω, T ≤ 100ms	-50	-75		V

LM2940-5.0 的参数介绍：

首先是基本介绍也就是 general description ，从这可以了解到 2940 最大输出电流有 1A, 典型的输入输出电压压降为 0.5V ，还有就是过流保护，过压保护这样一般电源芯片都有的东西

General Description

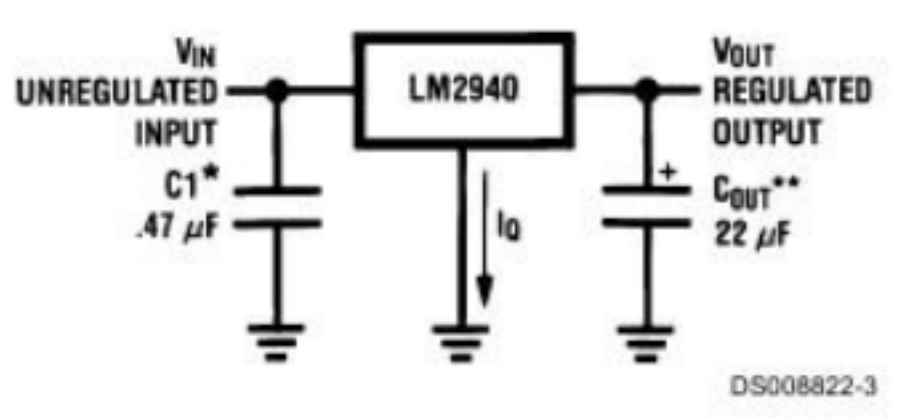
The LM2940/LM2940C positive voltage regulator features the ability to source 1A of output current with a dropout voltage of typically 0.5V and a maximum of 1V over the entire temperature range. Furthermore, a quiescent current reduction circuit has been included which reduces the ground current when the differential between the input voltage and the output voltage exceeds approximately 3V. The quiescent current with 1A of output current and an input-output differential of 5V is therefore only 30 mA. Higher quiescent currents only exist when the regulator is in the dropout mode ($V_{IN} - V_{OUT} \leq 3V$).

Designed also for vehicular applications, the LM2940/ LM2940C and all regulated circuitry are protected from reverse battery installations or 2-battery jumps. During line transients, such as load dump when the input voltage can momentarily exceed the specified maximum operating voltage, the regulator will automatically shut down to protect both the internal circuits and the load. The LM2940/ LM2940C cannot be harmed by temporary mirror-image insertion. Familiar regulator features such as short circuit and thermal overload protection are also provided.

Features

- Dropout voltage typically 0.5V @I_O = 1A
- Output current in excess of 1A
- Output voltage trimmed before assembly
- Reverse battery protection
- Internal short circuit current limit
- Mirror image insertion protection
- P+ Product Enhancement tested

接着就是典型电路图，一般接发直接按照典型电路图来接就 OK了，同样上图



LM2940 典型应用

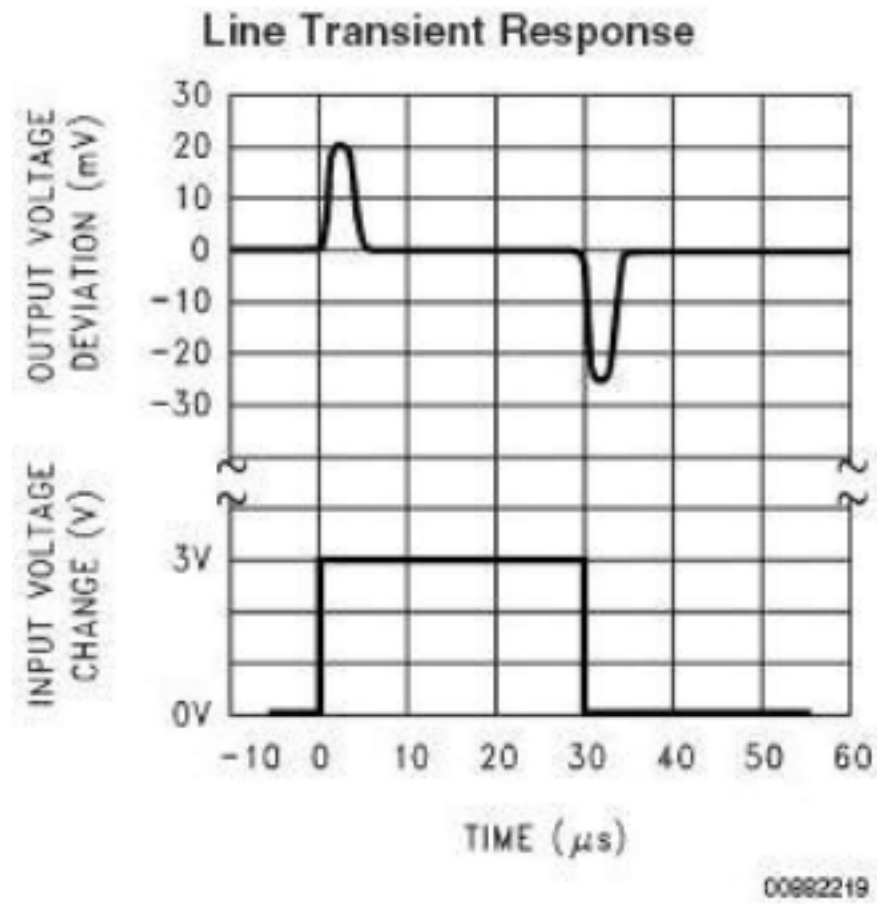
由图可见， 2940 的电路接发极其简单。

接着比较重要的参数就是 dropout voltage ，也就是输入输出压降

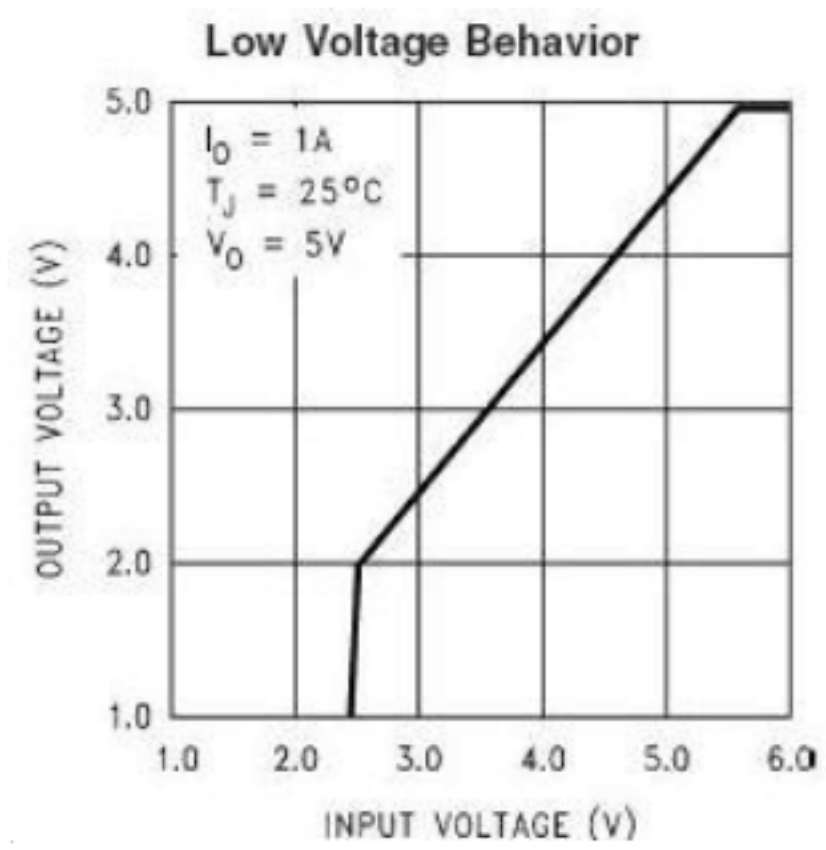
Output Voltage (V_O)		5V		
Parameter	Conditions	Typ	LM2940 Limit (Note 4)	LM2940/883 Limit (Note 5)
Dropout Voltage	I_O = 1A	0.5	0.8/**1.0**	0.7/**1.0**
	I_O = 100 mA	110	150/**200**	150/**200**

由表可知， LM2940-5.0 在输出电流为 1A时 dropout voltage 典型值为 0.5V，即输入电压要 > 输出电压 +0.5V=5.5V ；同样输出电流为 100mA时 dropout voltage 典型值为 110mV，输入电压大于 5.1V 即可

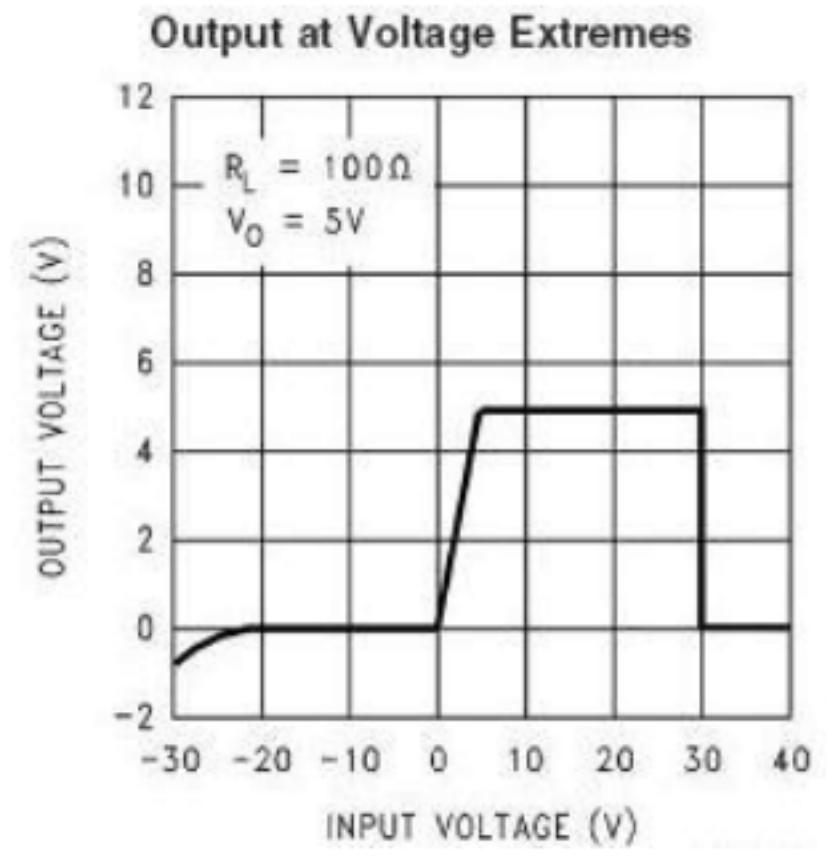
接下去的就是比较重要的一些图，依次介绍下



这个图表示 2940 的输入电压瞬间改变时输出电压的变化情况，由图可知输出电压在 10uS 内即可恢复正常



上图为输入电压低于正常值时，输入电压与输出电压间的关系（输出电流均保持在 1A 时）



上图为输入电压大于限定值时输出电压的情况，由图可得，输入电压大于 30V 时芯片启动了过压保护功能，输出电压在此刻变为 0V

LM2940 和 7805 的区别：

LM2940 比 7805 的转换效率高。7805 直接输入不接输出的情况下，其内部还会有 3mA的电流消耗（静态电流）。而 LDO元件的静态电流就比它远远小得多了。具体请看 LDO的解释。LM2940 就是一个 LDO