

1 HYBRID POWER ICs (Refer to individual specification for measurement requirements of electrical characteristics)

HYBRID IC REGULATORS (SWITCHING TYPE • 2 PACK TYPE)

Combination line-up		
Control section (SI-8020 series)	Power section (STR7000, 7100series)	
	Iout=6A	Iout=12A
SI-8020 (Vout=5V)	STR7001	STR7101
SI-8021 (Vout=12V)	STR7002	STR7102
SI-8022 (Vout=15V)	STR7002	STR7102
SI-8023 (Vout=24V)	STR7003	STR7103

Parts No.	Power section Maximum ratings (Ta=25°C)					Fig. No.
	Power transistor with-stand voltage V _{4-r} (V)	Collector current I _c (A)	Allowable loss (T _c =25°C) P _c (W)	Operating temperature (T _c) Top (°C)	Storage temperature T _{stg} (°C)	
STR7001	60	6(Peak7.5)	100	-30~+125	-30~+125	1
7002						
7003						
STR7101	60	12(Peak15)	125	-30~+125	-30~+125	1
7102						
7103						

Parts No.	Control section Maximum ratings (Ta=25°C)				Fig. No.
	DC input voltage V _{IN} (V)	Allowable loss P _c (W)	Operating temperature Top (°C)	Storage temperature T _{stg} (°C)	
SI-8020	55	1	-20~+85	-20~+100	2
8021					
8022					
8023					

Combined parts No.	Electrical characteristics (Ta=25°C)					
	DC input voltage range V _{IN} (V)	Output voltage setting V _o (V)	Output current I _o (A)	Output voltage regulation (against input voltage) ΔV _{LINE} (mV)max	Output voltage regulation (against output current) ΔV _{LOAD} (mV)max	Efficiency η (%typ)
SI-8020 -STR7001	11~40	5.1±0.1	6	80	30	72
SI-8021 -STR7002	18~50	12±0.2		120	40	84
SI-8022 -STR7002	21~50	15±0.2		150	40	86
SI-8023 -STR7003	30~50	24±0.3		200	50	90
SI-8020 -STR7101	11~40	5.1±0.1		80	30	70
SI-8021 -STR7102	18~50	12±0.2	12	120	40	82
SI-8022 -STR7102	21~50	15±0.2		150	40	84
SI-8023 -STR7103	30~50	24±0.3		200	50	87

HYBRID IC REGULATORS (SWITCHING TYPE WITH COIL)

Parts No.	Maximum ratings (Ta=25°C)			Integrated characteristics (Ta=25°C)						Fig. No.	Remarks
	DC input voltage V _{IN} (V)	Operating temperature Top (°C)	Storage temperature T _{stg} (°C)	DC input voltage V _{IN} (V)	Output voltage V _{out} (V)	Output current I _{out} (A)	Efficiency η (%typ)	Oscillation frequency f(kHz)	Switching ripple ΔV _r (mVp-p)		
SI-8201L	45	-10~+65	-25~+85	10~40	5.0±0.1	0.02~0.4	73	25min	60max	3	
-8202L				11~40	6.0±0.1	0.02~0.35	74		30typ		
-8203L				16~40	12.0±0.2		79		100max		
-8204L				10~40	5.2±0.1	73	30typ				
-8211L				60	-20~+85	15~55	5.0±0.1		0.02~0.3		63
-8301L	45	8~40		5.1±0.1		1max	73	25typ	45typ	5	
-8811L	35	-10~+70		12~30		5.0±0.25	0.05~0.45	72	50typ	50typ	6
-8911L	60	-10~+60		24~55	5.0±0.25	0~ -0.05	65		68typ	50typ	
					5.0±0.25	0.02~0.3		50typ			
					-5.0±0.25	0~-0.1		60typ			

HYBRID POWER IC REGULATORS (SWITCHING TYPE)

Parts No.	Maximum ratings (Ta=25°C)					Electrical characteristics (Ta=25°C)							Fig. No.	Remarks
	Input voltage VIN(V)	Output current Iout(A)	Power consumption (Tc=25°C) Pd(W)	Operating temperature Top(°C)	Storage temperature Tstg(°C)	Input voltage VIN(V)	Output voltage Vout(V)	Output voltage regulation (against input voltage) (mV)max	Output voltage regulation (against output current) (mV)max	Efficiency η (%)typ	Oscillation frequency f(kHz) typ	Ripple damping ratio (dB)typ		
STR2005	45	2.0	75	-20~+100	-20~+125	11~40	5.1±0.1	50	100	72	25	45	1	
2012						18~45	12±0.2	60						
2013						19~45	13±0.2							
2016						21~45	15±0.2							
2024						30~50	24±0.3							
20005						8~40	5.1±0.1			50				

HYBRID POWER IC REGULATORS (SWITCHING TYPE)

Parts No.	Maximum ratings (Ta=25°C)										Channel section temperature Tch(°C)
	Voltage between drain and source Voss(V)	Drain current (single pulse) Ib(A)	Voltage between gate and drain Vgs(V)	Avalanche energy resistance Eas(mJ)	Out put power Pout(W)	Control power source voltage VIN(V)	Drive terminal source current IsOURCE(A)	Drive terminal sink current IsINK(A)	Operating temperature Top(°C)		
STR-S6401 -S6401F	500	±40	±20	500	250	35	0.7	1.5	-20~+125	+150	

Thermal resistance θch-F (°C/W)	Electrical characteristics (Ta=25°C)																			
	Starting voltage VINON(V)			Stopping voltage VINOFF(V)			Circuit current during operation IINON(mA)	Circuit current non-operation IINOFF(μA)	Oscillation frequency fosc(kHz)			Maximum ON time TON(μs)			los terminal threshold voltage Vds(mV)			los terminal outflow current Ios(μA)		
	min	typ	max	min	typ	max	typ	max	min	typ	max	min	typ	max	min	typ	max	min	typ	max
0.7	14.4	16	17.6	8.4	9.4	10.4	23	500	93	100	107	5.1	5.7	6.5	160	200	240	250	400	550

Amp terminal outflow current Iamp. (mA)	SS terminal threshold voltage Vss(V)	SS terminal outflow current Iss(μA)	Com terminal outflow current Icom. (A)	Electrical characteristic (Ta=25°C)								Fig. No.	Remarks
				FET ON resistance Rds(ON)(Ω)		Forward conduction admittance yfs (S)	Source grounding input capacity Ciss(pF)	Switching time ton(ns)	Switching time toff(ns)				
				typ	max					typ	max		
1.8	0.4	100	1.0	1.5	0.5	0.6	9.2	1800	60	140	8	Built-in MOSFET	

HYBRID POWER IC REGULATORS (DROPPER TYPE)

Parts No.	Maximum ratings (Ta=25°C)					Electrical characteristics (Ta=25°C)					Fig. No.	Remarks	
	Input voltage VIN(V)	Output current Iout(A)	Allowable loss (Tc=25°C) Pd(W)	Operating temperature Top(°C)	Storage temperature Tstg(°C)	Input voltage VIN(V)	Output voltage Vo(V)		Input-output differential voltage Vdif(V)max	Temperature coefficient (mV/°C)typ			Ripple damping ratio (dB)typ
SI-3050C	35	1.5	18	-30~+100	-40~+125	6~30	3000C*	3000CA	1.0	±0.5	54	9	Low loss type Remote sensing possible Built-in overcurrent, overvoltage, overheating protections
-3090C						10~30	9±0.36	9±0.18		±1.0			
-3120C						13~30	12±0.48	12±0.24		±1.5			
-3150C						16~30	15±0.6	15±0.3		±2.5			
-3240C						25~40	24±0.96	24±0.48					

* "A" may be stamped at the right of marking.

Parts No.	Maximum ratings (Ta=25°C)					Electrical characteristics (Ta=25°C)					Fig. No.	Remarks	
	Input voltage VIN(V)	Output current Iout(A)	Power consumption (Tc=25°C) Pd(W)	Operating temperature Top(°C)	Storage temperature Tstg(°C)	Output voltage Vout(V)	Minimum input/output differential voltage Vdif(V)max	Temperature coefficient (mV/°C)typ	Output voltage regulation (against input voltage) (mV)typ	Output voltage regulation (against output current) (mV)typ			Ripple damping ratio (dB)typ
SI-3052V	25	2.0	50	-20~+100 (Tc)	-30~+125	5±0.1	1.0	±0.5	10	40	54	10	Low loss type Built-in overcurrent protection
-3122V	30					12±0.2		±1.5	20	80			
-3152V						15±0.2							
SI-3052P	45	20	50	-20~+80	-30~+125	5±0.1	3.0	±0.5	2	40	60	10	Built-in overcurrent protection
-3122P						12±0.2		±1.5	10	80			
-3152P						15±0.2		±2.5	25	120			
-3242P						24±0.2							
STR9005	25	4.0	75	-20~+100 (Tc)	-30~+125	5±0.1	1.0	±0.5	10	40	54	1	Low loss type Built-in overcurrent protection Output ON/OFF control Output voltage fine tuning possible
9012	30					12±0.2		±1.5	30	80			
9015	30					15±0.2		50	100				

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VOLTAGE DOUBLER, BRIDGE RECTIFIER AUTOMATIC SWITCHING ICs

Parts No.	Maximum ratings (Ta=25°C)					Electrical characteristics (Ta=25°C)					Fig. No.
	Peak repeated OFF voltage V _{DRM} (V)	Effective ON current I _T (RMS)(A)	Surge ON current I _{TSM} (A)	Operating temperature T _{OP} (°C)	Storage temperature T _{STG} (°C)	Voltage doubler startup voltage V _S (V _{AC})	Settling switch voltage		OFF voltage I _{DRM} (μA)	ON voltage V _{TH} (V)	
							V _{C1} (V)	V _{C2} (V _{AC})			
STR80145A	500	5.0	50	-10~	-30~	80max	196±5	145	100max	1.8max	11
81145A		10.0	100	+100(T _C)	+125		215±5	159			
81159A											

STEPPING MOTOR DRIVE ICs

Parts No.	Maximum ratings (Ta=25°C)					Electrical characteristics (Ta=25°C)						Fig. No.	Remarks	
	Power Source voltage V _{CC} (V)	Output current I _O (A)	Junction temperature T _J (°C)	Operating temperature T _{OP} (°C)	Storage temperature T _{STG} (°C)	Power source V _{CC} (V)			Output current I _O (A)max	Exciting signal input current I _I (mA)max	V _{CC2} input current I _{CC2} (mA)max			
						min	typ	max						
SI-7115B	40	1.7	+125	-20~ +80	-30~ +100	20	24	30	1.5	5	—	12	For unipolar drive	
-7300A	48(V _{CC1}) 7(V _{CC2})	1.7				15(V _{CC1}) 4.5(V _{CC2})	30(V _{CC1}) 5(V _{CC2})	42(V _{CC1}) 5.5(V _{CC2})	1.5	10	45	13		
	42(V _{CC1}) 7(V _{CC2})	3.2				15(V _{CC1}) 4.5(V _{CC2})	30(V _{CC1}) 5(V _{CC2})	35(V _{CC1}) 5.5(V _{CC2})	3.0	100	45	14		
-7500A	40(V _{CC1}) 8(V _{CC2})	1.2				17(V _{CC1}) 4.5(V _{CC2})	24(V _{CC1}) 5(V _{CC2})	30(V _{CC1}) 5.5(V _{CC2})	1.0	0.21	15	14		
-7200M	50(V _{CC1}) 10(V _{CC2})	1.2				15(V _{CC1}) 4.5(V _{CC2})	30(V _{CC1}) 5(V _{CC2})	40(V _{CC1}) 5.5(V _{CC2})	1.0	1.6	45	13		For bipolar drive
	50(V _{CC1}) 7(V _{CC2})	3.2				15(V _{CC1}) 4.5(V _{CC2})	30(V _{CC1}) 5(V _{CC2})	45(V _{CC1}) 5.5(V _{CC2})	3.0	1.6	150	14		

Full view (Unit:mm)

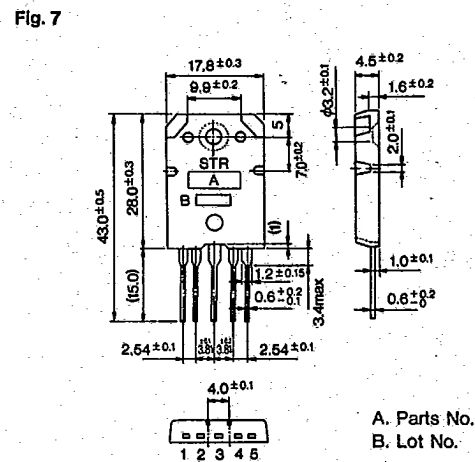
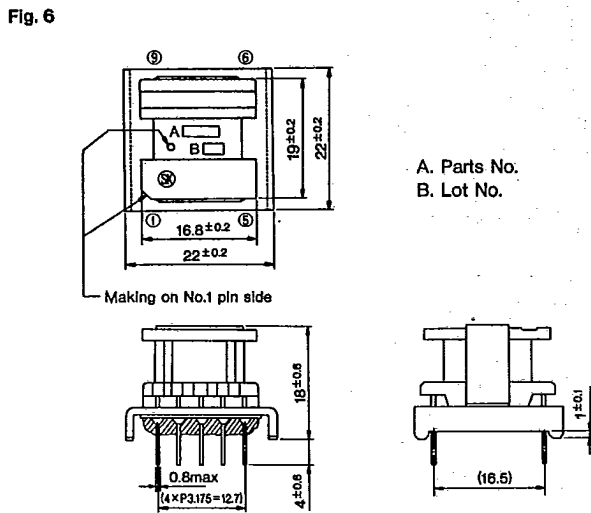
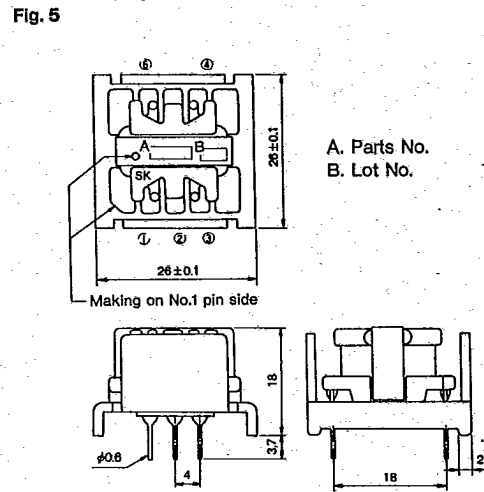
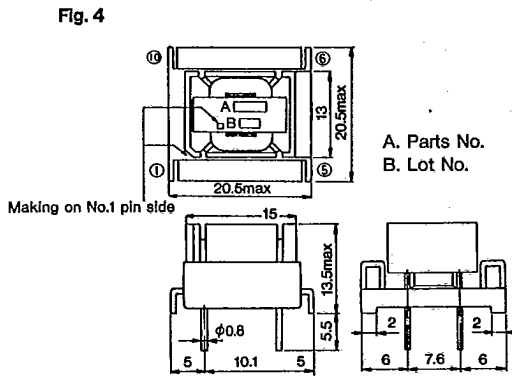
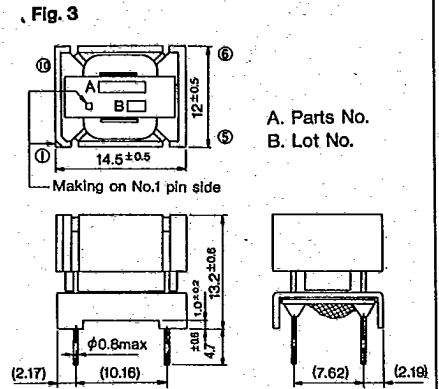
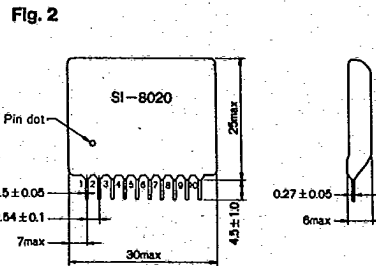
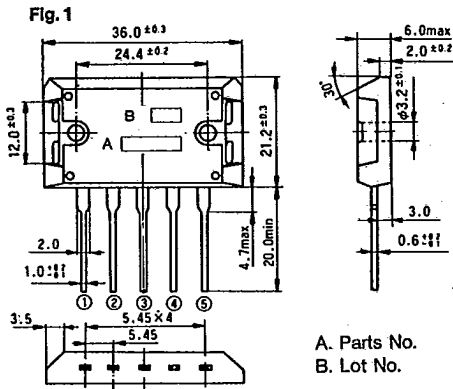


Fig. 8

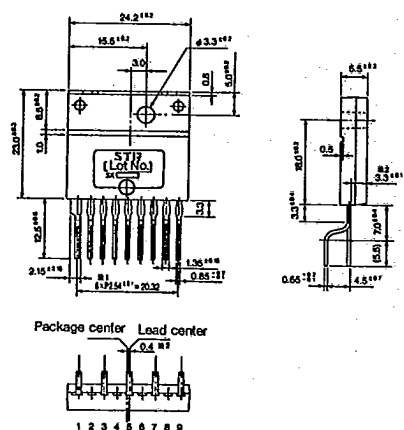


Fig. 9

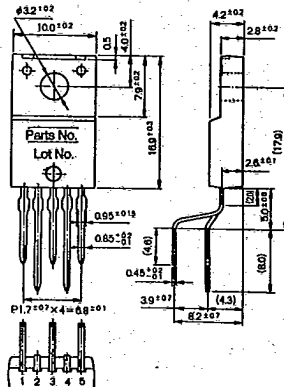
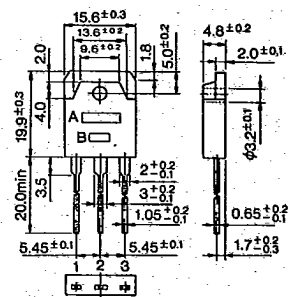


Fig. 10 MT-100(TO-3P)



A. Parts No.
B. Lot No.

Fig. 11

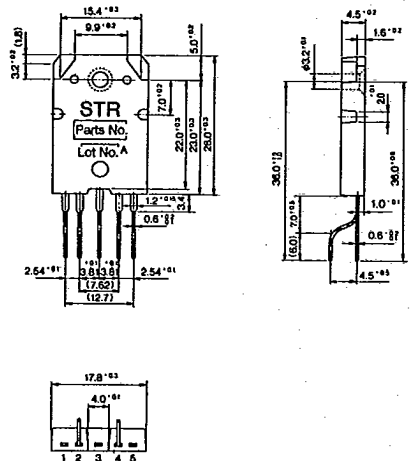
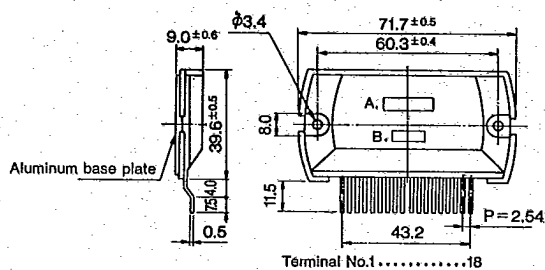
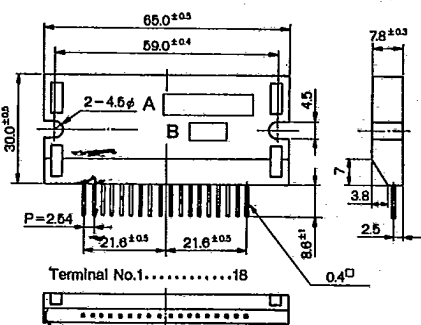


Fig. 12



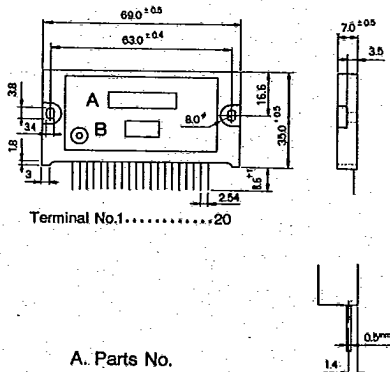
A. Parts No.
B. Lot No.

Fig. 13



A. Parts No.
B. Lot No.

Fig. 14

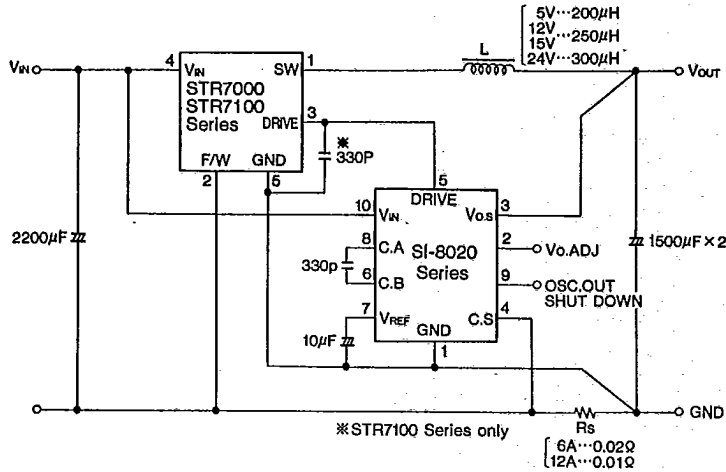


A. Parts No.
B. Lot No.

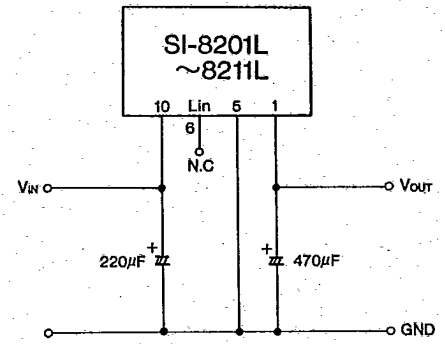
Standard connection diagram

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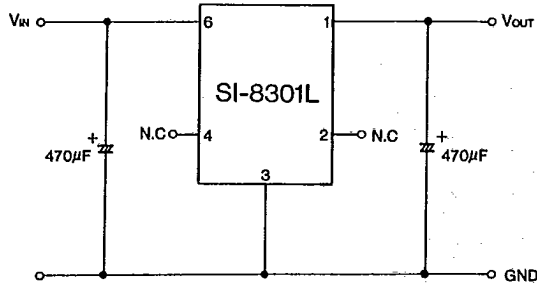
STR7000,7100/SI-8020 Series



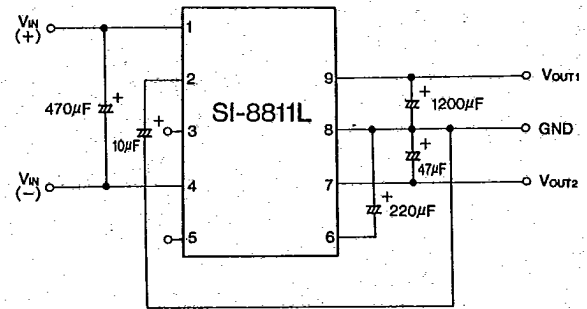
SI-8000L Series



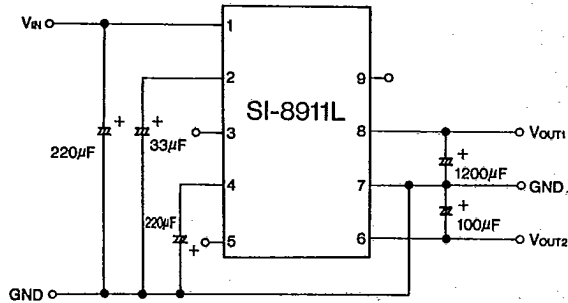
SI-8301L



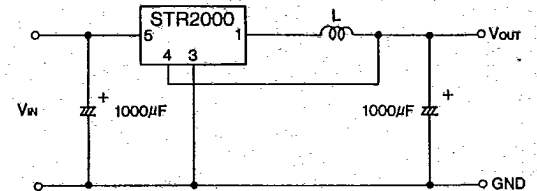
SI-8811L



SI-8911L

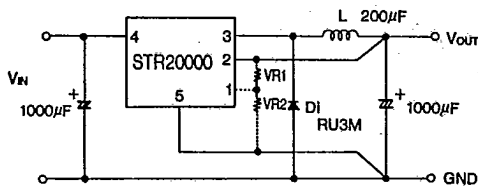


STR2005~2024

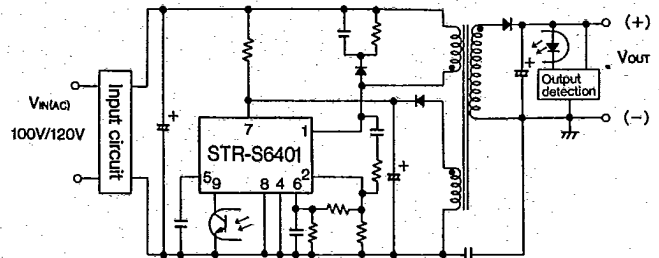


Parts No.	Coil (L) capacity
STR2005	200µH
STR2012	300µH
STR2013	300µH
STR2015	350µH
STR2024	400µH

STR20005



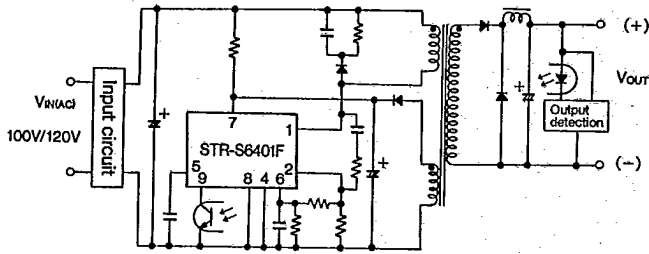
STR-S6401 Example of application circuit



Flyback converter

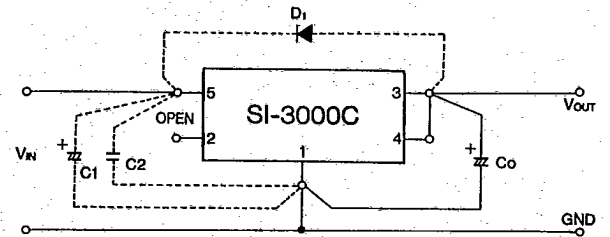
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STR-S6401F Example of application circuit



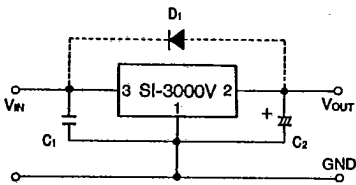
Forward converter

SI-3000C



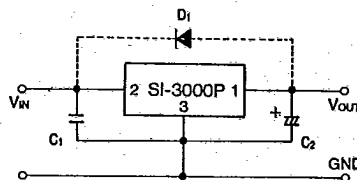
C₀ : 47~100μF
 C₁ C₂ : Oscillation prevention capacitor (C₁ : Approx. 47μF, C₂ : Approx. 0.33μF)
 D₁ : Protection diodes
 Required in case reversely biased between input and output

SI-3000V



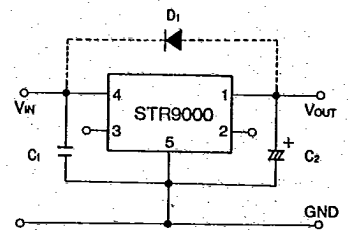
C₁ : Oscillation prevention capacitor (0.33μF)
 C₂ : 47~100μF
 D₁ : Protection diodes
 Required in case reversely biased between input and output

SI-3000P



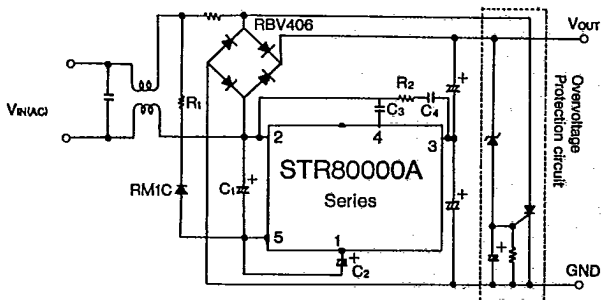
C₁ : Oscillation prevention capacitor (0.33μF)
 C₂ : 47~100μF
 D₁ : Protection diodes
 Required in case reversely biased between input and output

STR9000



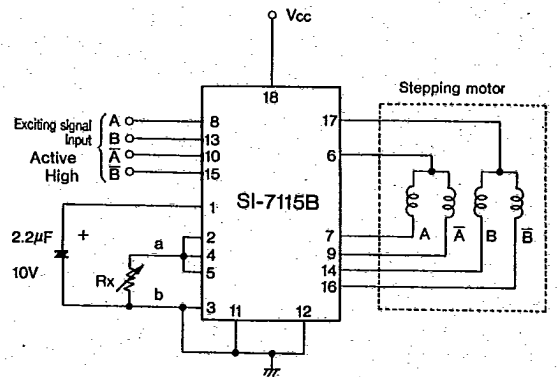
C₁ : Oscillation prevention capacitor (0.33μF)
 C₂ : 47~100μF
 D₁ : Protection diodes
 Required in case reversely biased between input and output

STR80000A Example of application circuit

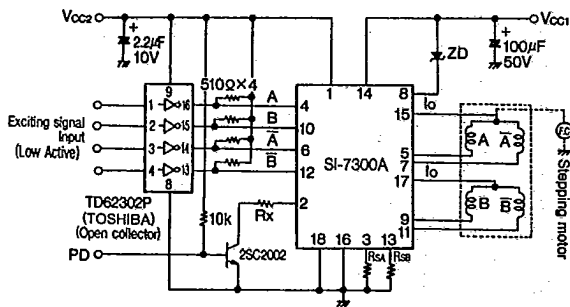


R₁ : 2.2Ω R₂ : 4.7Ω
 C₁ : 2.2μF/400V C₂ : 100μF/10V C₃ : 0.1μF
 C₄ : 0.047μF

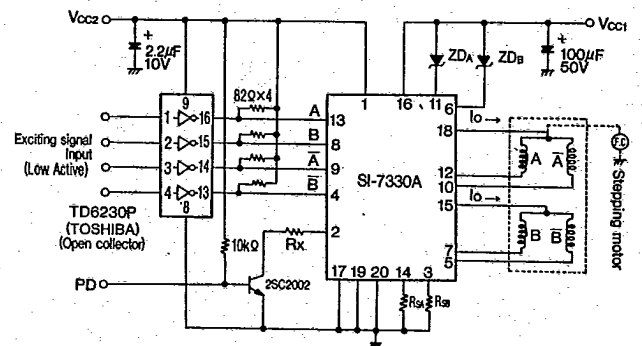
SI-7115B



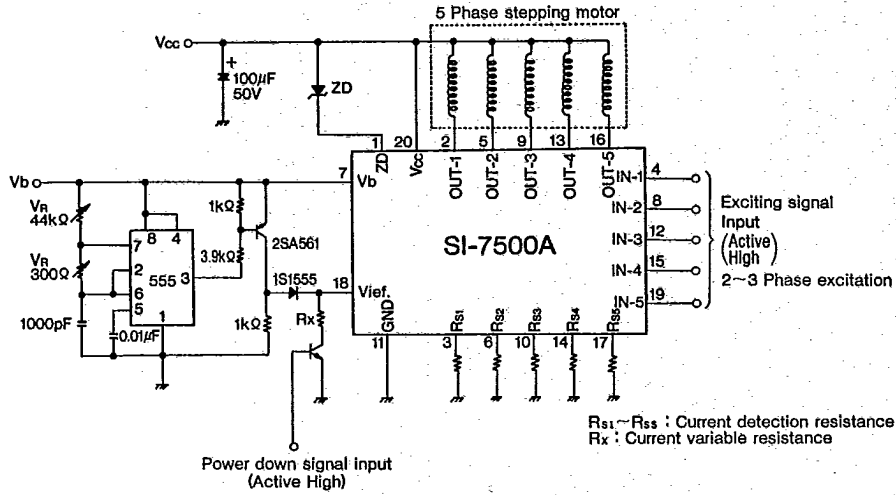
SI-7300A



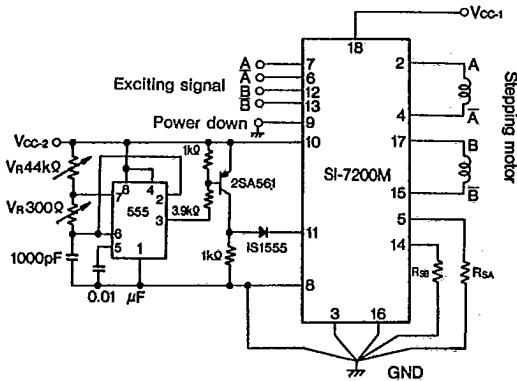
SI-7330A



SI-7500A

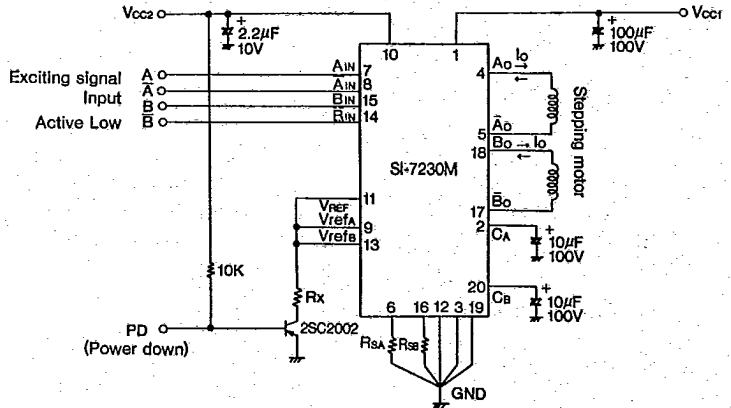


SI-7200M

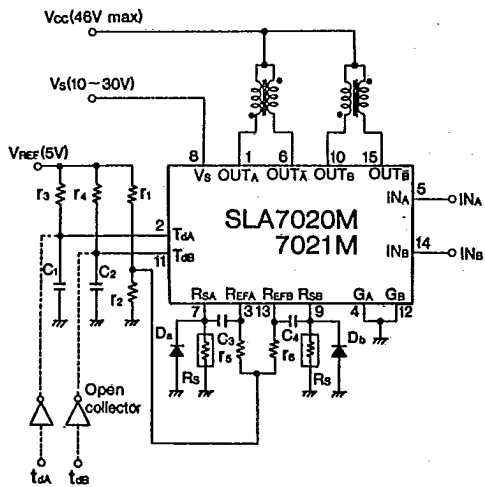


Power down Exciting signal : Active High
Exciting signal Input : Active Low

SI-7230M

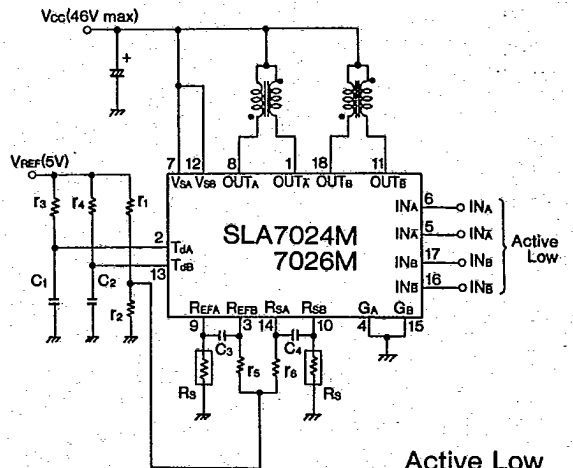


SLA7020M•SLA7021M



- | | |
|-------------------------|---|
| f ₁ 510Ω | C ₁ 470PF |
| f ₂ 100Ω(VR) | C ₂ 470PF |
| f ₃ 47kΩ | C ₃ 2200PF |
| f ₄ 47kΩ | C ₄ 2200PF |
| f ₅ 2.4kΩ | D _a , D _b EK03(7020M) RK34(7021M) |
| f ₆ 2.4kΩ | R _s 1Ω typ(7020M) 0.68Ω typ(7021M) |

SLA7024M•SLA7026M



- | | |
|-------------------------|-------------------------------------|
| f ₁ 510Ω | C ₁ 470pF |
| f ₂ 100Ω(VR) | C ₂ 470pF |
| f ₃ 47kΩ | C ₃ 220pF |
| f ₄ 47kΩ | C ₄ 220pF |
| f ₅ 2.4kΩ | R _s 1Ω (typ) ~ 2W(7024M) |
| f ₆ 2.4kΩ | 0.68Ω (typ) ~ 2W(7026M) |

Active Low
(Also possible to cope with Active High)