

2-HEAD PLAYBACK AND RECORD AMPLIFIER FOR VCR

- ONE 5V POWER SUPPLY
- PLAYBACK/RECORD MODE SELECTION THROUGH A LOGIC INPUT
- PINNING COMPATIBLE WITH STV5725 AND STV5728
- SO14 PACKAGE

PLAYBACK MODE

- LOW NOISE AND WIDE BAND AMPLIFIERS
- AUTOMATIC OFFSET CANCELLATION
- ONE PLAYBACK OUTPUT WITH AGC
- ONE PLAYBACK OUTPUT (CONSTANT GAIN)
- ONE OUTPUT FOR AUTOMATIC TRACKING WITH GAIN SWITCH

RECORD MODE

- TRANSCONDUCTANCE AMPLIFIER

DESCRIPTION

STV5727 is intended for 2 heads VCR applications. It includes all the electrical functions necessary to achieve play-back and record processing for VHS applications.

Record or Playback Mode can be selected through SWR Pin.

Playback Mode

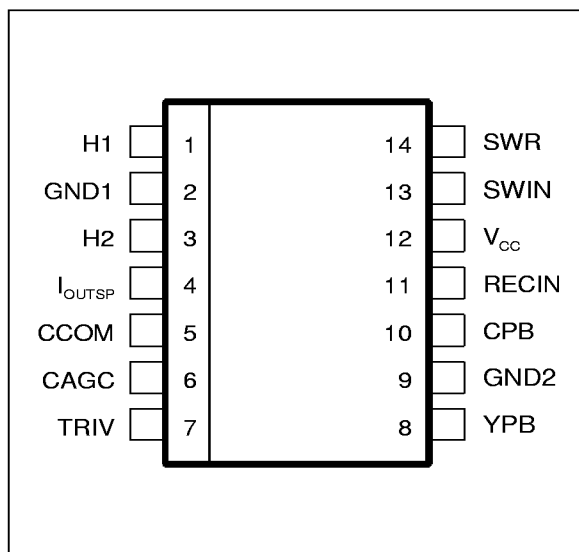
Signals applied on H1 and H2 input pins will be amplified by 60dB voltage gain. I_{OUTSP} Pin is AC short-circuited to ground by CCOM. The input signal can be selected through SWIN Pin and the corresponding output signal will be available on Pin CPB. The offset voltage between the two heads is automatically cancelled after 32 switching head cycles. A constant output signal will be available on Pin YPB thanks to an AGC function (Automatic Gain Control). The time constant of the AGC is determined by the capacitor value connected to CAGC Pin. For Automatic Tracking, a signal which is a function of the selected input signal amplitude is present on Pin TRIV. According to the voltage level on SWIN Pin, the triv gain can be change.

Record Mode

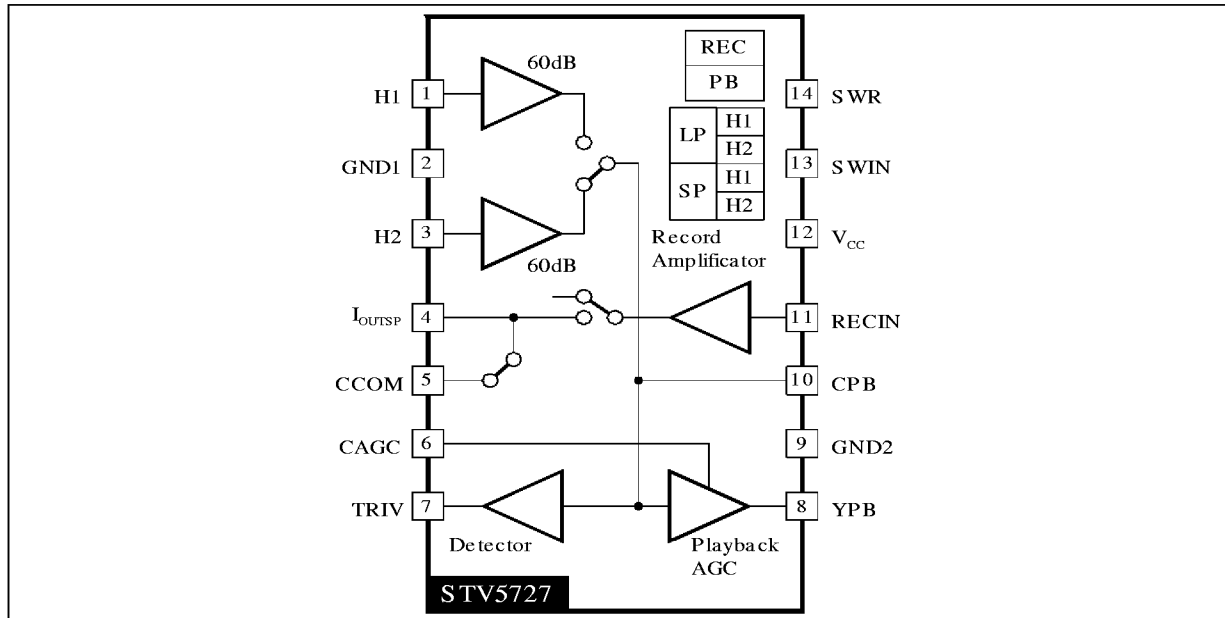
The current input applied on RECIN Pin is amplified through a transconductance amplifier. Special care has been taken to speed up commutation from Playback to Record and from Record to Playback, avoiding spikes through the loads (the rotary transformers).



PIN CONNECTIONS



BLOCK DIAGRAM



5727-02.EPS

ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V _{CC}	Power Supply Voltage	6	V
T _j	Junction Temperature	150	°C
T _{oper}	Operating Temperature	0, +70	°C

5727-01.TBL

THERMAL DATA

Symbol	Parameter	Value	Unit
R _{th(j-a)}	Junction-ambient Thermal Resistance	120	°C/W

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RECOMMENDED OPERATING CHARACTERISTICS

Symbol	Parameter	Min.	Typ.	Max.	Unit
V _{CC}	Power Supply	4.75	5	5.25	V
CAGC	Capacitance on Pin CAGCREC	4.7	22		nF
CCOM	Decoupling Capacitor	4.7	470		nF

5727-03.TBL

ELECTRICAL CHARACTERISTICS ($T_{amb} = 25^{\circ}\text{C}$, unless otherwise specified)**Playback Mode**

$V_{CC} = 5\text{V}$, no load on YPB and CPB Pins, after 32 SWH (Switching Head) cycles.

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
PLAYBACK AMPLIFIER						
I _{CC1}	Supply Current		26	33	40	mA
GPB	Playback Gain	Sinewave 600kHz, 0.4mV _{PP} on inputs	58	60	62	dB
EN	Equivalent Voltage Noise	Input grounded via I _{OUT} Pin @ 600kHz, BW = 10kHz	0.5	0.6	0.7	$\frac{\text{nV}}{\sqrt{\text{Hz}}}$
IN	Equivalent Input Current	Input open @ 6MHz, BW = 10kHz	1.4	2	2.6	$\frac{\text{pA}}{\sqrt{\text{Hz}}}$
CRT1	Crosstalk	Sinewave @ 4MHz, 0.4mV _{PP}		-35	-30	dB
RPBSW	Playback Switch on Resistor	@ 6MHz	0.8	2.5	18	Ω
BWLCF	Attenuation @ 100kHz	Reference level @ 600kHz	-1	0	1	dB
BWHCF	Attenuation @ 8MHz	Reference level @ 4MHz	-3	-1	1	dB
C _{IN}	Input Capacitance	@ 6MHz	22	27	32	pF
R _{IN}	Input Resistance	@ 6MHz	500	730	950	Ω
ZCPB	Output Resistance	DC	5	14	50	Ω
VDCPB1	DC Level on Pin YCPB		1.35	1.75	2.15	V
DVDC	Head Switch Offset		-200	0	200	mV
SHPB1	2nd Harmonic	Sinewave @ 4MHz, 0.4mV _{PP}		-43	-37	dB

PLAYBACK AGC FUNCTION

ZYPB	Output Impedance @ YPB		5	14	50	Ω
VDCPB2	DC Level @ YPB		1.15	1.45	1.85	V
BWLCF2	Attenuation @ 100kHz	Reference @ 4MHz, PB AGC locked	-1	0	1	dB
BWHCF2	Attenuation @ 8MHz	Reference @ 4MHz, PB AGC locked	-3	-1	1	dB
VLPB	Output Amplitude	Sinuswave @ 4MHz, 0.4mV _{PP} on input	160	200	250	mV _{PP}
SHPB2	Second Harmonic	Sinuswave @ 4MHz, 0.4mV _{PP} on input		-44	-40	dB
IPB+	CAGC Sink Current		50	100	150	μA
IPB-	CAGC Source Current		-150	-100	-50	μA
DVLP	AGC Sensitivity	Sinuswave @ 4MHz, 0.2mV _{PP} on input, -5dB and +6dB	-1	0	1	dB

TRIV FUNCTION

VTRIV0	Output Level (1)	SP mode, V _{cpb} = 0mV _{PP} @ 4MHz	0.05	0.28	0.7	V
VTRIV4	Output Level (4)	LP mode, V _{cpb} = 600mV _{PP} @ 4MHz	3.8	4.1	4.5	V
VTRIV5	Output Level (5)	SP mode, V _{cpb} = 100mV _{PP} @ 4MHz		1.33		V
VTRIV6	Output Level (6)	SP mode, V _{cpb} = 200mV _{PP} @ 4MHz		2.27		V
VTRIV7	Output Level (7)	LP mode, V _{cpb} = 100mV _{PP} @ 4MHz	1.4	1.8	2.2	V
VTRIV8	Output Level (8)	LP mode, V _{cpb} = 200mV _{PP} @ 4MHz		3.11		V
VTRIV9	Output Level (9)	SP mode, V _{cpb} = 300mV _{PP} @ 4MHz		2.95		V
VTRIV10	Output Level (10)	SP mode, V _{cpb} = 600mV _{PP} @ 4MHz	3.45	3.85	4.25	V
FTRIV1	Response Lower Frequency, Attenuation @ 1MHz	Reference : SP mode, V _{cpb} = 100mV _{PP} @ 4MHz		-6		dB
FTRIV2	Response Higher Frequency, Attenuation @ 8MHz	Reference : SP mode, V _{cpb} = 100mV _{PP} @ 4MHz		-1		dB

5727-04.TBL

ELECTRICAL CHARACTERISTICS ($T_{amb} = 25^{\circ}C$, unless otherwise specified) (continued)

Record Mode

$V_{CC} = 5V$, $SWR = 5V$, $RRCY = 2.2k\Omega$, $RRCC = 8.2k\Omega$, $CCOM = 470nF$.

Load $10\mu H//1k\Omega$ for each simulated head.

Damping network of $1nF/620\Omega$ connected between I_{OUTSP} and Ground.

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
RECORD AMPLIFIER						
I_{CC2}	Current Supply		42	55	70	mA
IHA0	DC Current through I_{OUTSP}		25	35	45	mA
IHA2	2nd Harmonic	$VRCY = 300mV_{PP} @ 4MHz$		-49	-40	dB
IMAX	Maximum Current	@ 4MHz, 2nd harmonic < 35dB	35			mA_{PP}
BWRECL	Attenuation at 100kHz	Reference level @ 600kHz	-1	0	1	dB
BWRECH	Attenuation at 8MHz	Reference level @ 4MHz	-2	0	1	dB
TRSP	Transconductance SP	$V_{IN} = 300mV_{PP} @ 4MHz$	64	69	74	mA/V
RSAT	Output Stage Resistance	$I = 10mA$	5	11	20	Ω
RIOUT	Impedance on I_{OUTSP}	$\Delta V = 1V$	40	100	300	$k\Omega$

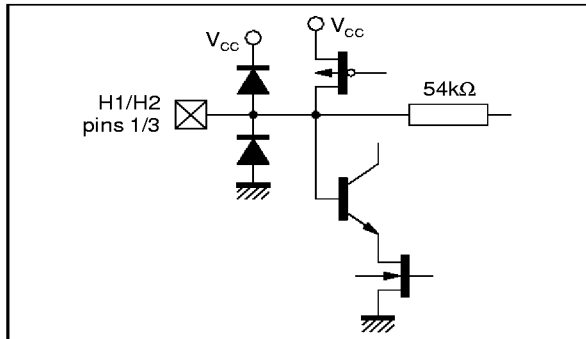
SWITCHING LEVELS

VSWIN1	SWIN Input Threshold	Selects head H2, SP mode	0		0.4	V
VSWIN2	SWIN Input Threshold	Selects head H1, SP mode	1		2.2	V
VSWIN3	SWIN Input Threshold	Selects head H2, LP mode	2.8		4	V
VSWIN4	SWIN Input Threshold	Selects head H1, LP mode	4.6		5	V
ISWIN1	VSWIN = 0V	Input Current	-1	-0.5	-0.1	μA
ISWIN2	VSWIN = 1.5V	Input Current	0.1	0.4	2	μA
ISWIN3	VSWIN = 3.5V	Input Current	0.1	0.4	2	μA
ISWIN4	VSWIN = 5V	Input Current	0.1	0.5	2	μA
VSWRH	SWR Input Threshold	Selects record mode	3.5		5	V
VSWRL	SWR Input Threshold	Selects playback mode	0		1.5	V
ISWRH	VSWR = 5V	Input current	0	0.1	5	μA
ISWRL	VSWR = 0V	Input current	-10	-5	-0.5	μA
T_{ON}	Switching Delay	Signal appears on CPB			500	ns
T1	Delay from Playback to Record : Signal Disappears on Pin CPB			1		μs
T2	Delay from Record to Playback : Signal Appears on Pin CPB			800		μs
T3	Delay from Playback to Record : Signal Appears on Pin I_{OUTSP}			20		μs
T4	Delay from Record to Playback : Signal Disappears on Pin I_{OUTSP}			1		μs

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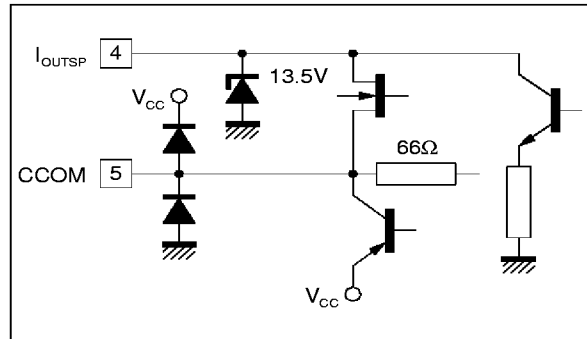
INPUTS/OUTPUTS EQUIVALENT INTERNAL DIAGRAMS

Figure 1



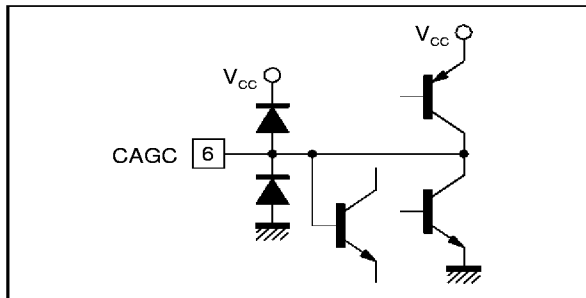
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Figure 2



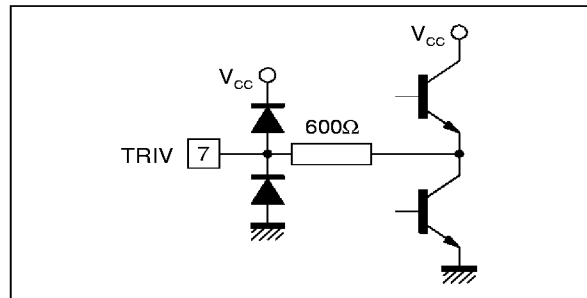
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Figure 3



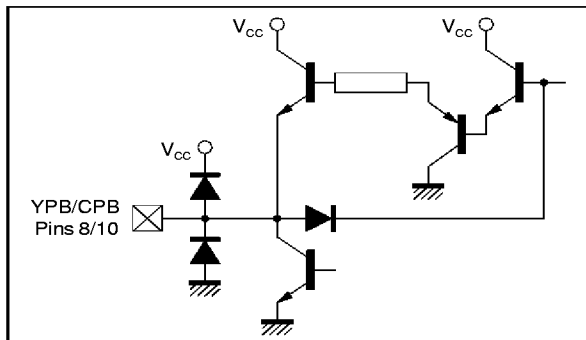
5727-10.EPS

Figure 4



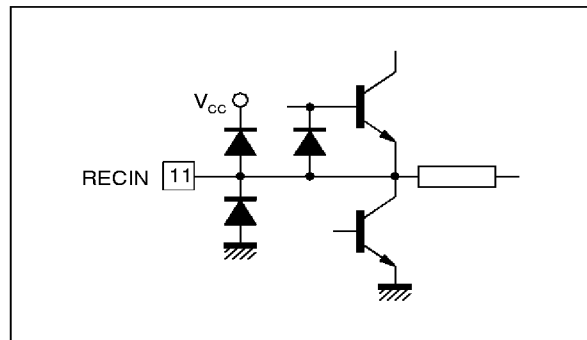
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Figure 5



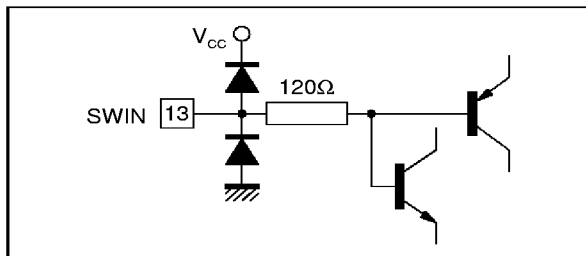
5727-07.EPS

Figure 6



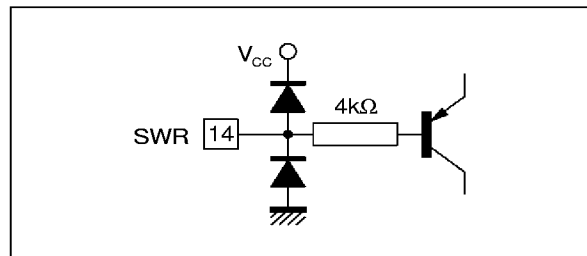
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Figure 7



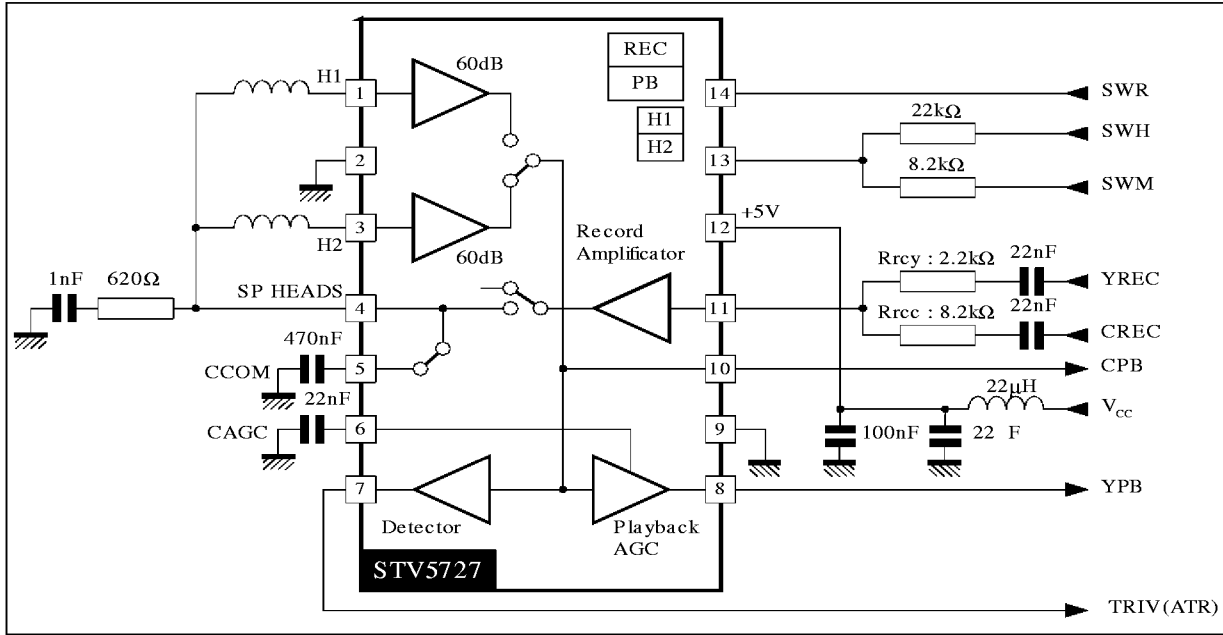
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Figure 8



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TYPICAL APPLICATION



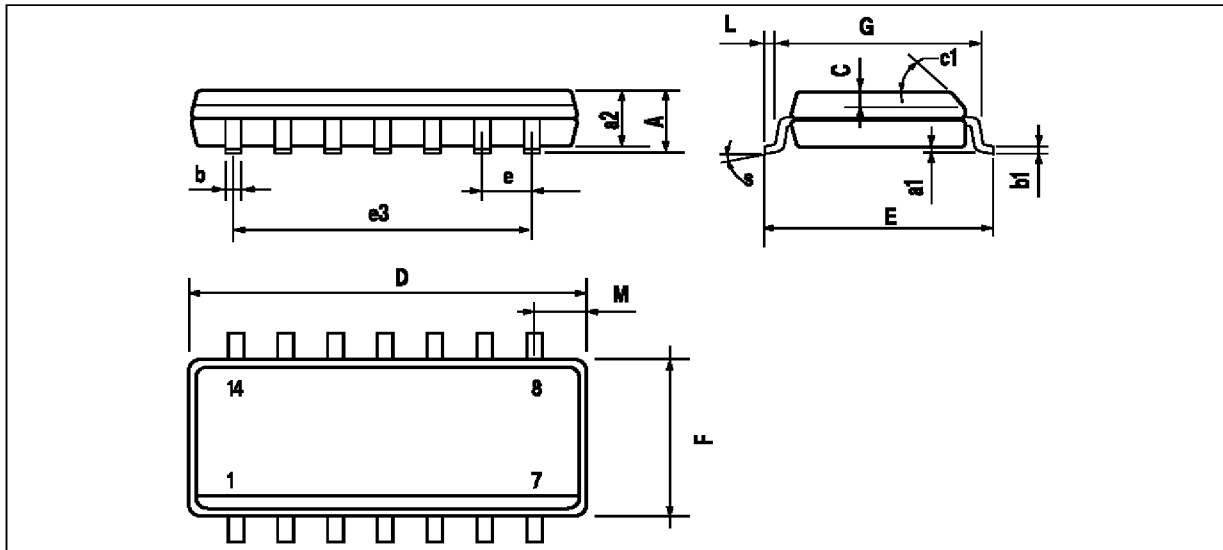
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SWITCH TABLE

SWR	SWH	SWM	Channel
L (PB)	L	L	H2
	H		H1
	L	H	H2
	H		H1
H (REC)	X	X	

5727-06.TBL

PACKAGE MECHANICAL DATA
 14 PINS - PLASTIC MICROPACKAGE (SO)



PM-SO14.EPS

Dimensions	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A			1.75			0.069
a1	0.1		0.25	0.004		0.009
a2			1.6			0.063
b	0.35		0.46	0.014		0.018
b1	0.19		0.25	0.007		0.010
C		0.5			0.020	
c1	45° (typ.)					
D	8.55		8.75	0.336		0.344
E	5.8		6.2	0.228		0.244
e		1.27			0.050	
e3		7.62			0.300	
F	3.8		4.0	0.15		0.157
L	0.4		1.27	0.016		0.050
M			0.68			0.027
S	8° (Max.)					

SO14.TBL

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