

HIGH EFFICIENCY QUAD BRIDGE CAR RADIO POWER AMPLIFIER

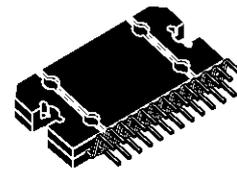
PRODUCT PREVIEW

- HIGH OUTPUT POWER CAPABILITY
4 x 22W/4Ω @ 14.4V, 1KHz, 10%
- DUAL MODE OPERATING EXTERNALLY PRESETTABLE: CONVENTIONAL CLASS A-B MODE, HIGH EFFICIENCY MODE
- LOW EXTERNAL COMPONENTS COUNT:
 - NO BOOTSTRAP CAPACITORS
 - NO EXTERNAL COMPENSATION
 - INTERNALLY FIXED GAIN (26dB)
- CLIPPING DETECTOR
- ST-BY FUNCTION (CMOS COMPATIBLE)
- MUTE FUNCTION (CMOS COMPATIBLE)
- AUTOMUTE AT MINIMUM SUPPLY VOLTAGE DETECTION
- LOW RADIATION

Protections:

- OUPUT SHORT CIRCUIT TO GND; TO Vs; ACROSS THE LOAD
- 3 STEPS OVERRATING CHIP TEMPERATURE
- LOAD DUMP VOLTAGE
- FORTUITOUS OPEN GND
- LOUDSPEAKER DC CURRENT
- ESD

MULTIPOWER BCD TECHNOLOGY



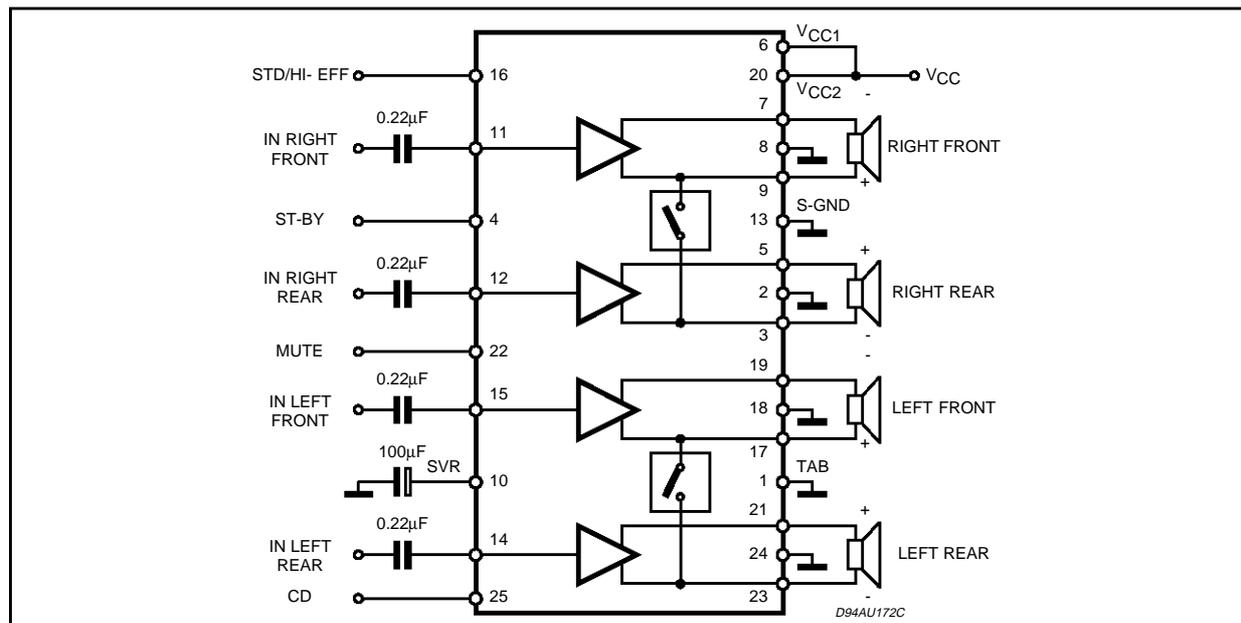
Flexiwatt 25

DESCRIPTION

The TDA7454 is a new BCD technology QUAD BRIDGE type of car radio amplifier in Flexiwatt25 package specially intended for car radio applications.

Among the features, its superior efficiency performance coming from the internal exclusive structure, makes it the most suitable device to simplify the thermal management in high power sets. The dissipated output power under average listening condition is in fact reduced up to 50% when compared to the level provided by conventional class AB solutions.

BLOCK & APPLICATION DIAGRAM



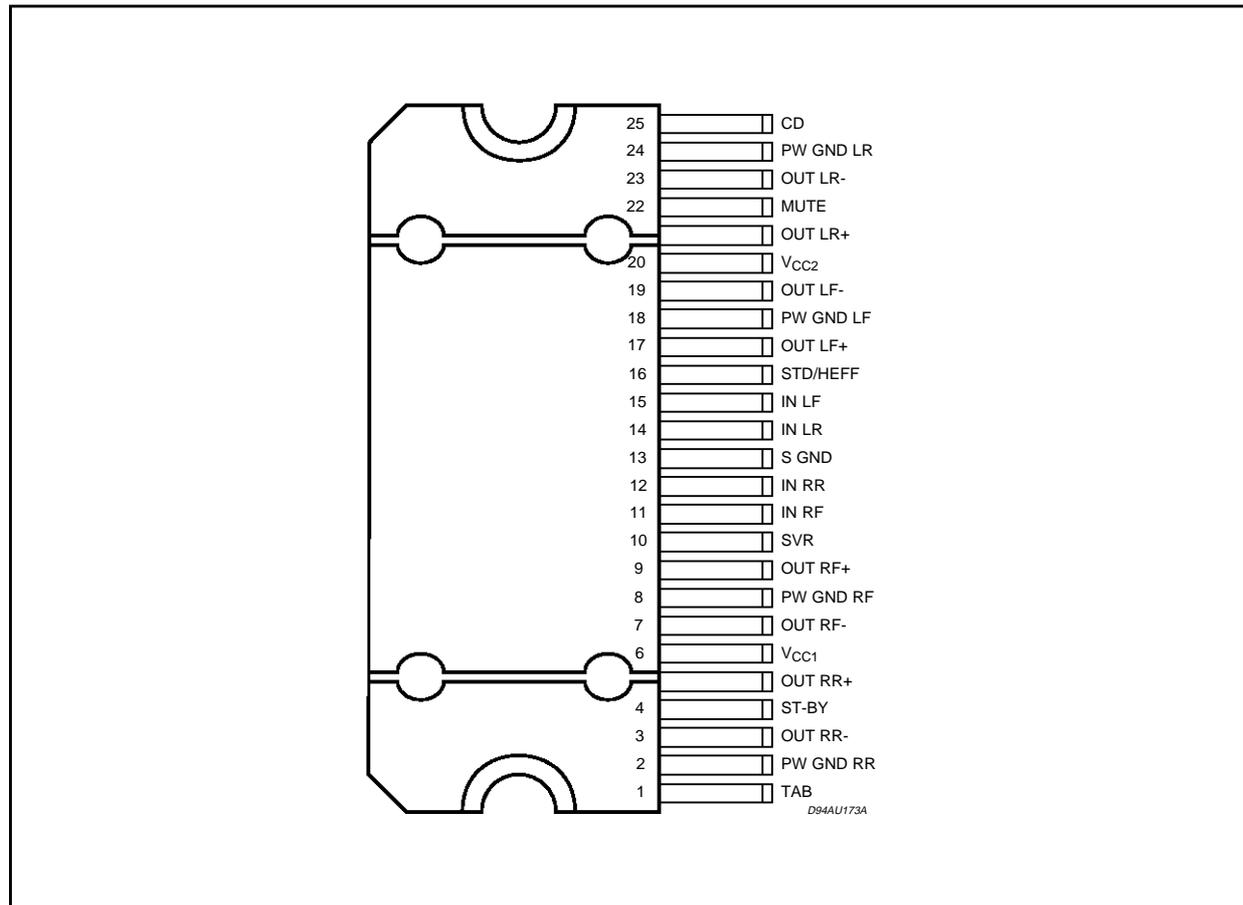
ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V_{op}	Operating Supply Voltage	18	V
V_s	DC Supply Voltage	28	V
V_{peak}	Peak Supply Voltage (for $t = 50ms$)	40	V
I_o	Output Peak Current (not repetitive $t = 100\mu s$)	4.5	A
I_o	Output Peak Current (repetitive $f > 10Hz$)	3.5	A
P_{tot}	Power Dissipation $T_{case} = 70^\circ C$	86	W
T_{stg}, T_j	Storage and Junction Temperature	-55 to 150	$^\circ C$

THERMAL DATA

Symbol	Description	Value	Unit
$R_{th\ j-case}$	Thermal Resistance Junction-case	Max 1	$^\circ C/W$

PIN CONNECTION (Top view)

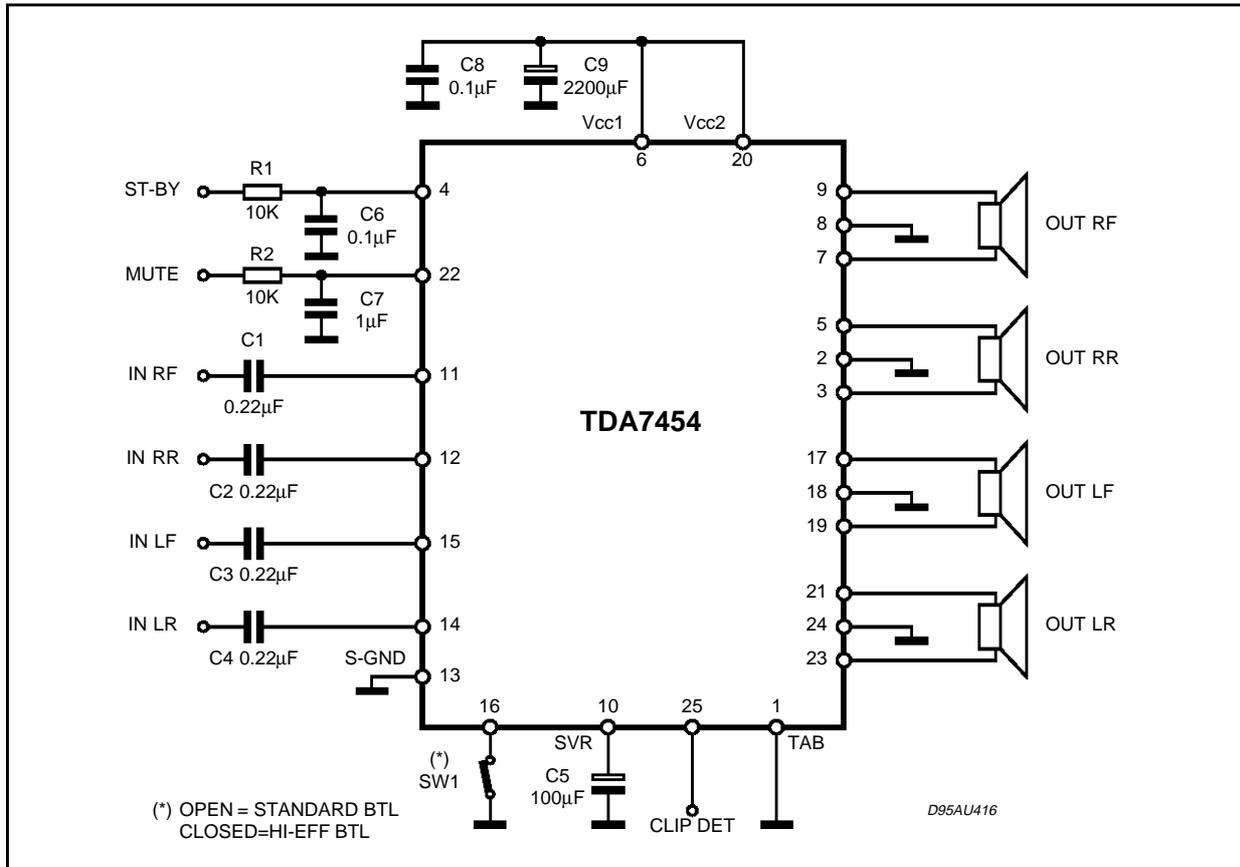


ELECTRICAL CHARACTERISTICS (Refer to the test circuit $V_S = 14.4V$; $R_L = 4\Omega$; $f = 1KHz$;
 $T_{amb} = 25^\circ C$, unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
V_S	Supply Voltage Range		8		18	V
I_d	Total Quiescent Drain Current			140		mA
P_O	Output Power	@ EIAJ		30		W
		THD = 10%		22		W
		THD = 1% : BTL MODE		18		W
THD	Total harmonic distortion	$P_O = 1W$: BTL MODE		0.03		%
		$P_O = 10W$: BTL MODE		0.03		%
		$P_O = 1W$: Hi-EFF MODE		0.03		%
C_T	Cross Talk	$f = 1KHz$		55		dB
		$f = 10KHz$		45		dB
R_{IN}	Input Impedance			15		K Ω
G_V	Voltage Gain		25	26	27	dB
ΔG_V	Voltage Gain Match				1	dB
E_{IN}	Output Noise Voltage	$R_g = 600\Omega$		100		mV
SVR	Supply Voltage Rejection	$f = 300Hz$; $V_r = 1V_{pp}$; $R_g = 0$ to 100Ω ;		50		dB
BW	Power Bandwidth	(-3dB)	75			KHz
A_{SB}	Stand-by Attenuation			100		dB
$V_{sb IN}$	Stand-by in Threshold				1.5	V
$V_{sb OUT}$	Stand-by out Threshold		3.5			V
I_{sb}	Stand-by Current Consumption				100	μA
A_M	Mute Attenuation			90		dB
$V_{M IN}$	Mute in Thereshold				1.5	V
$V_{M OUT}$	Mute out Threshold		3.5			V
I_M	Mute pin Current (Sourced)	$V = 0$ to V_S $V_{S max} = 18V$		1		μA
	Mode Select Switch	Standard BTL Mode Op. ($V_{pin 16}$)	Open			
		High Efficiency Mode ($V_{pin 16}$)			0.5	V
CD	Clip Det. out Current (Pull up to 5V with 10K Ω)	CD off: $P_{Omin} = 10W$ CD on: THD = 5%		150	5	μA μA

TDA7454

Figure 1: Standard Test and Application Circuit.



MODE SELECTION TABLE OPERATION OF THE DEVICE

1) STD/HI-EFF (pin 16 = OPEN)

STANDARD QUAD BRIDGE MODE	HIGH-EFF QUAD BRIDGE MODE	STANDARD QUAD SINGLE-ENDED MODE	ST-BY MODE
			→ Tchip (deg)
100		150	170

2) STD/HI-EFF (pin 16 = GND)

HIGH-EFF QUAD BRIDGE MODE	STANDARD QUAD SINGLE-ENDED MODE	ST-BY MODE
		→ Tchip (deg)
150		170

1) STD/HI-EFF (pin 16 connected as shown in the figure below.)

STANDARD QUAD BRIDGE MODE OR HIGH-EFF QUAD BRIDGE MODE (Theatsink dependent)	HIGH-EFF QUAD BRIDGE MODE	STANDARD QUAD SINGLE-ENDED MODE	ST-BY MODE
			→ Tchip (deg)
100		150	170

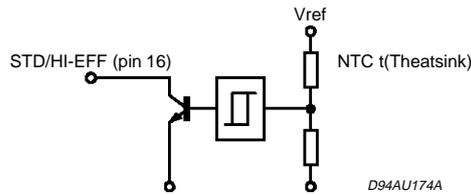


Figure 3: Quiescent Current vs. Supply Voltage

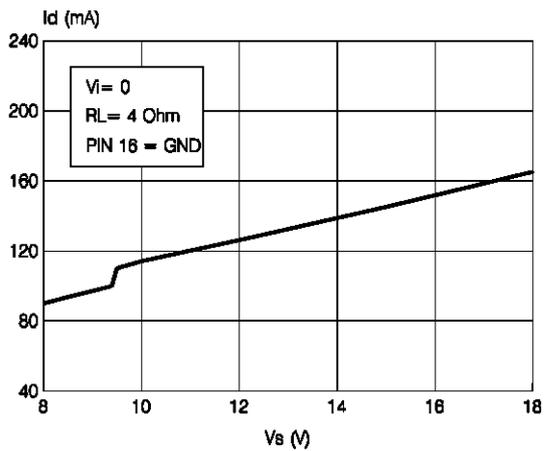


Figure 4: Output Power vs. Supply Voltage

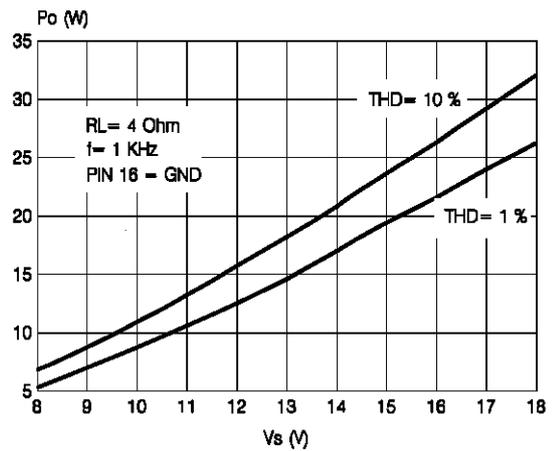


Figure 5: Distortion vs. Frequency

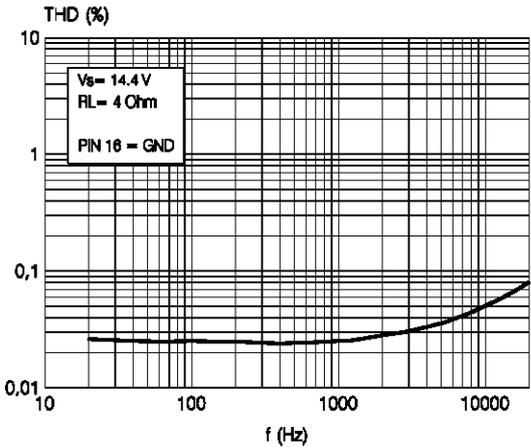


Figure 6: Muting Attenuation vs. Vpin 22

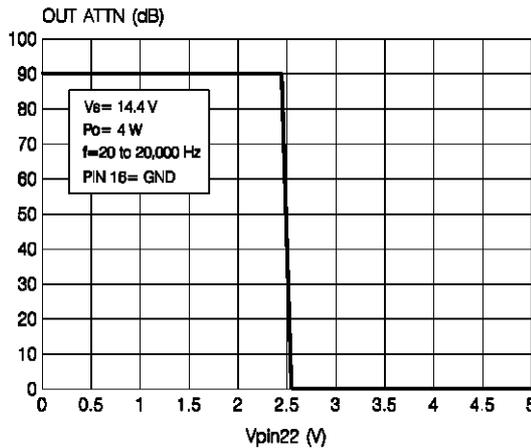


Figure 7: Supply Voltage Rejection vs. Frequency

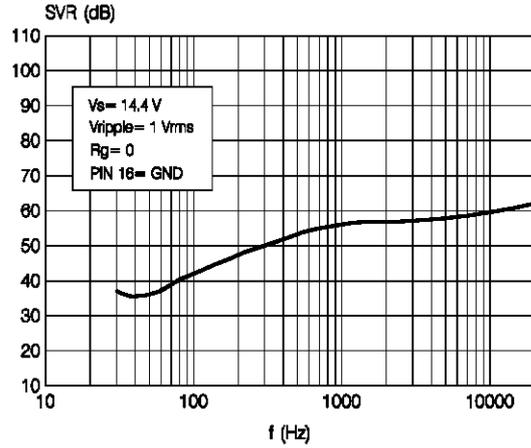
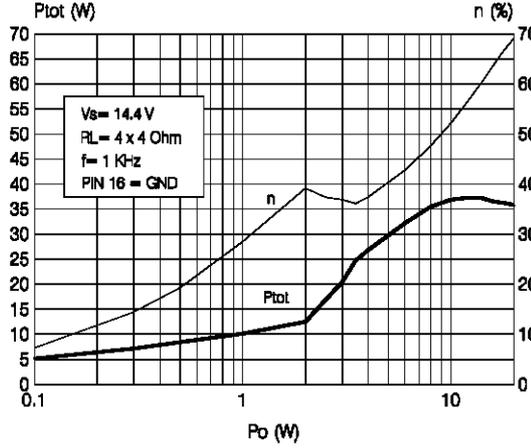
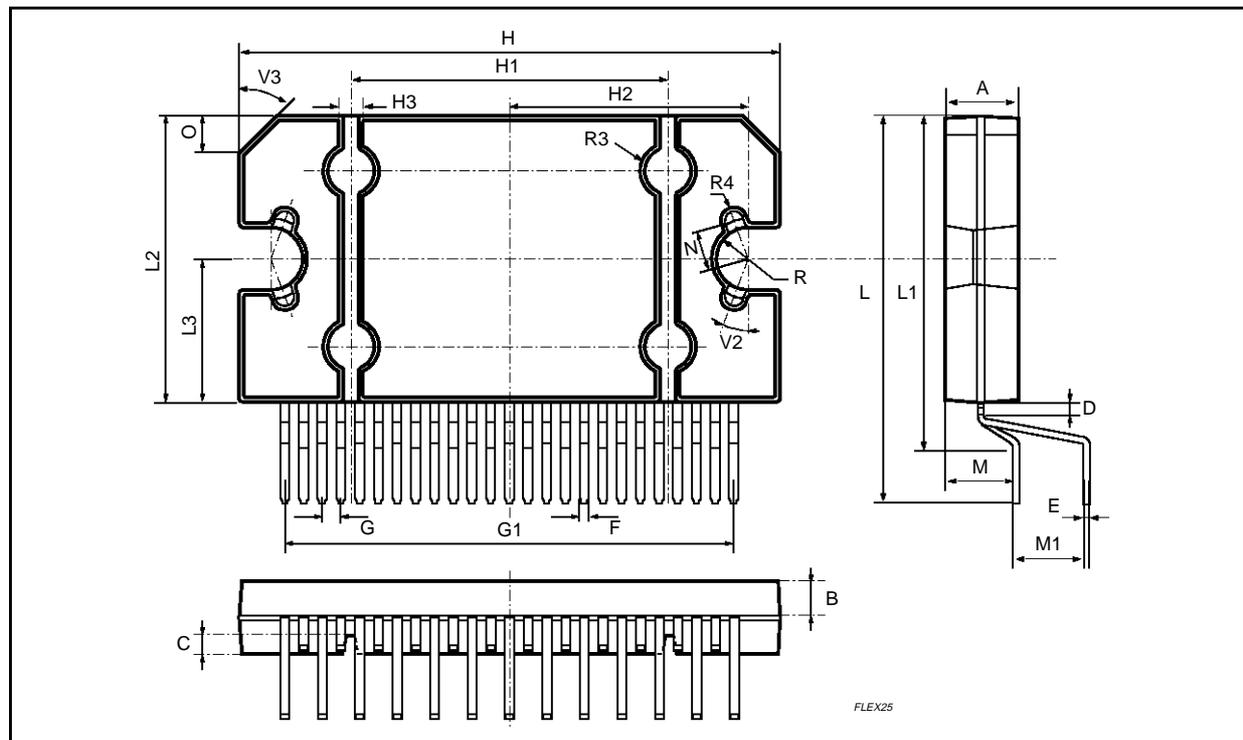


Figure 8: Power Dissipation & Efficiency vs. Output Power



FLEXIWATT25 PACKAGE MECHANICAL DATA

DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	4.45		4.65	0.175		0.183
B	1.80	1.90	2.00	0.070	0.074	0.079
C		1.40			0.055	
D	0.75	0.90	1.05	0.029	0.035	0.041
E	0.37	0.39	0.42	0.014	0.015	0.016
F			0.57			0.022
G	0.80	1.00	1.20	0.031	0.040	0.047
G1	23.75	24.00	24.25	0.935	0.945	0.955
H	28.90	29.23	29.30	1.138	1.150	1.153
H1		17.00			0.669	
H2		12.80			0.503	
H3		0.80			0.031	
L	21.57	21.97	22.37	0.849	0.865	0.880
L1	18.57	18.97	19.37	0.731	0.786	0.762
L2	15.50	15.70	15.90	0.610	0.618	0.626
L3	7.70	7.85	7.95	0.303	0.309	0.313
M	3.70	4.00	4.30	0.145	0.157	0.169
M1	3.60	4.00	4.40	0.142	0.157	0.173
N		2.20			0.086	
O		2			0.079	
R		1.70			0.067	
R4		0.50			0.019	
V2	20°					
V3	45°					



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