



TDA7475A

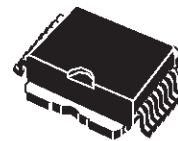
ELECTRO-LUMINESCENT DISPLAY DRIVER

- INTERNAL CLOCK GENERATION
- STAND-BY FUNCTION
- VOLTAGE SET-UP CONVERSION FUNCTION
- ANTI-RADIATION TRAPEZOIDAL WAVE FOR E.L. DISPLAY DRIVING
- CONSTANT CURRENT CHARGE/DISCHARGE OF E.L. DISPLAY
- 2-STEP BRIGHTNESS CONTROL (NORMAL OR DIMMED LUMINANCE)
- PROTECTIONS WITH AUTOMATIC RESET:
 - COIL-SWITCHING MOS OVERCURRENT
 - CHIP OVERTEMPERATURE

DESCRIPTION

The TDA7475 is a new BCD OFF-LINE technology device intended for EL display lighting in car-radio applications. Time-extended luminance is achieved by driving the display with constant-current

BCD OFF-LINE TECHNOLOGY

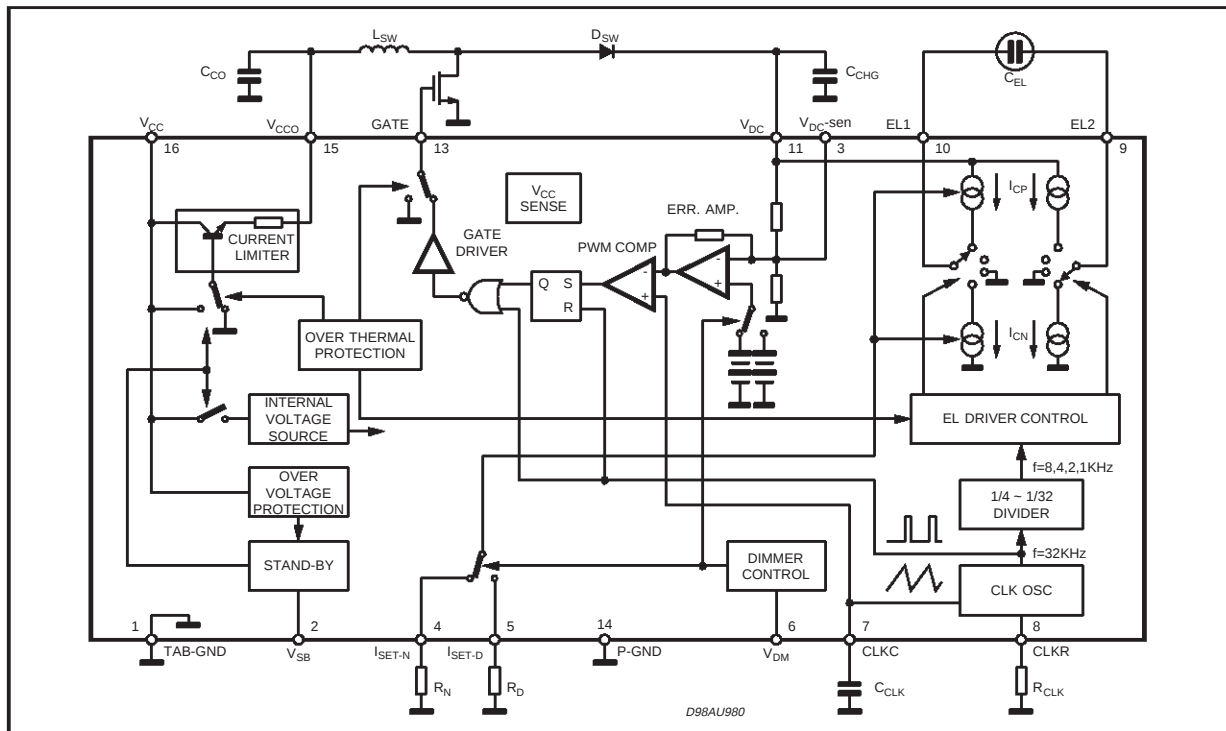


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ORDERING NUMBER: TDA7475A

rent pulses, which will automatically compensate for the ageing-related capacitance loss by providing more elevated voltage pulses.

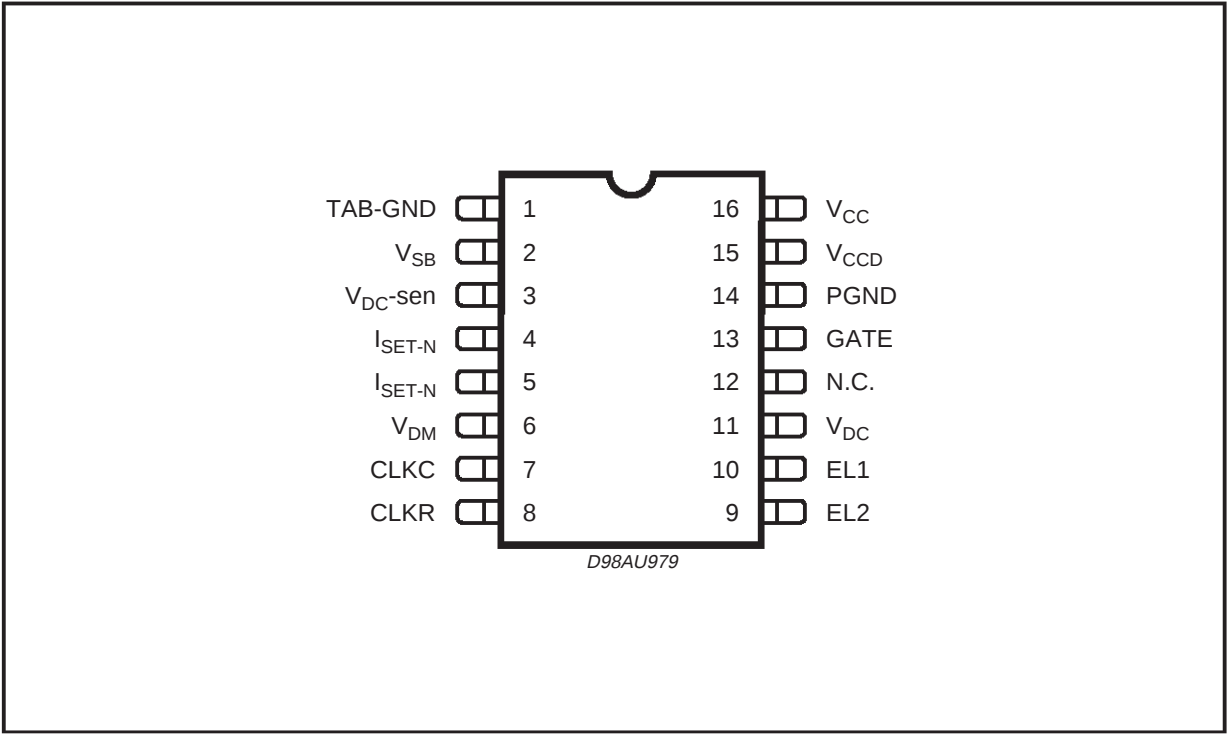
BLOCK DIAGRAM



ABSOLUTE MAXIMUM RATINGS

Symbol	Parameter	Value	Unit
V _{CC} (DC)	DC supply voltage	25	V
V _{CC} (pk)	Peak supply voltage	50	V
V _{SB}	Input voltage of V _{SB} pin	18	V
V _{DM}	Input voltage of VDM pin	18	V
V _{DC}	Step up voltage	490	V
V _o (min)	Minimum Output Voltage (pin 9, 10)	-0.2	V
T _{opr}	Operating temperature range	-40 to +85	°C
T _{stg}	Storage temperature range	-55 to +150	°C
T _j	Junction temperature	160	°C

PIN CONNECTION



THERMAL DATA

Symbol	Parameter	Value	Unit
R _{th(j-c)}	Thermal resistance Junction-case Max.	3	°C/W

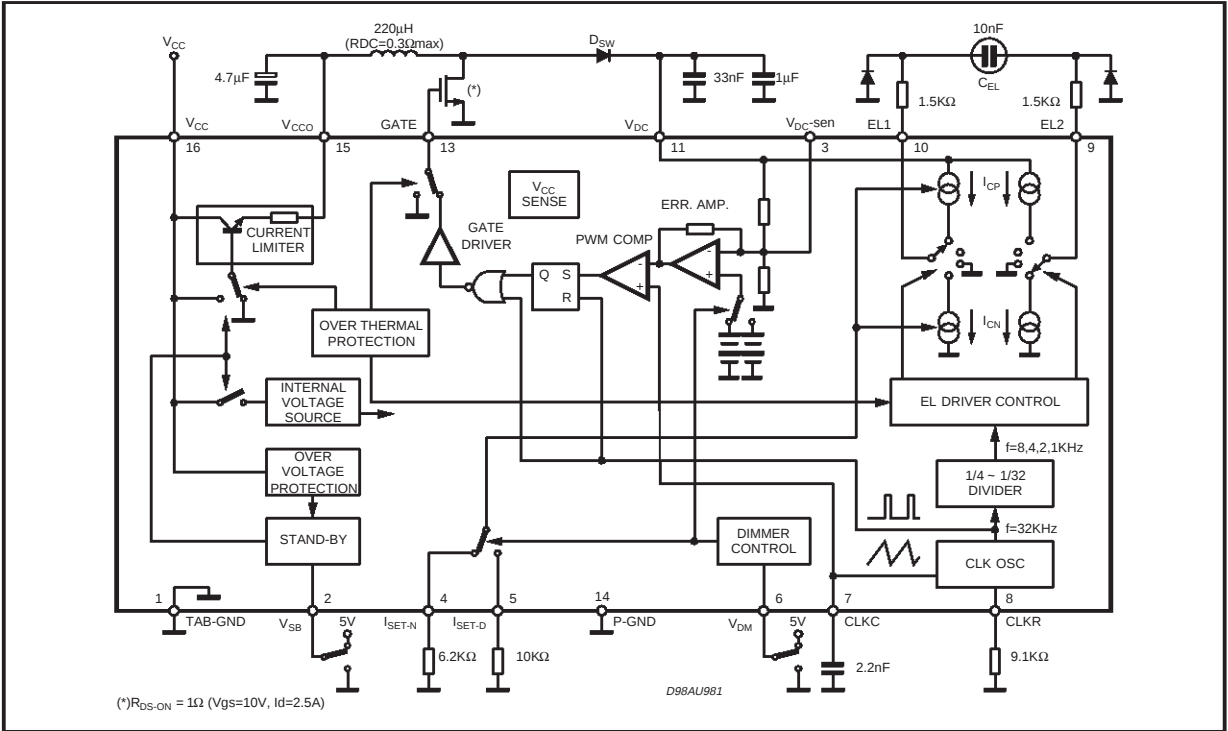
ELECTRICAL CHARACTERISTICS (Refer to the test and application circuit, $V_{CC} = 13.2V$, $T_{amb} = 25^{\circ}C$, unless otherwise specified.)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
OPERATING CONDITIONS						
V _{CC}	Operating supply voltage		10	13.2	17	V
V _{SB(off)} V _{SB(on)}	Input voltage of V _{SB} pin	V _{SB} : L V _{SB} : H	0 3.5		1.5 V _{CC}	V V
I _{SB1(on)} I _{SB2(on)}	Input current of V _{SB} pin	V _{SB} = 5V V _{CC} = 14.4V, V _{SB} = 14.4V			10 200	μA μA
V _{DM(off)} V _{DM(on)}	Input voltage V _{DM} pin	V _{DM} : L (Normal) V _{DM} : H (Dimmer)	0 3.5		1.5 V _{CC}	V V
I _{DM1(on)} I _{DM2(on)}	Input current of V _{DM} pin	V _{DM} = 5V V _{CC} = 14.4V, V _{DM} = 14.4V			10 200	μA μA
STEP UP VOLTAGE						
V _{DC-N1}	V _{DC} voltage	V _{DM} :L (Normal)	440	460	480	V
V _{DC-N2}		V _{DM} : H (Dimmed)	400	420	445	V
EL OUTPUT BLOCK						
I _{CP-N1}	EL charge current	V _{DM} :L (Normal) V _{CC} = 10V V _{CC} = 17V	14.5		17.5	mA
I _{CP-N4}			14.5		17.5	mA
I _{CP-N5}			14.5		17.5	mA
I _{CP-D1}		V _{DM} :H (Dimmer)	9		11	mA
N1/P1-N	I _{CN1-N} to I _{CP1-N} ratio	V _{DM} :L (Normal)	2.05	2.45	2.7	—
N2/P2-N	I _{CN2-N} to I _{CP2-N} ratio		2.05	2.45	2.7	—
N1/P1-D	I _{CN1-D} to I _{CP1-D} ratio	V _{DM} :H (Dimmer)	2.05	2.45	2.7	—
N2/P2-D	I _{CN2-D} to I _{CP2-D} ratio		2.05	2.45	2.7	—
T _{ON}	Output time of I _{CP}		118	125	132	μs
f _{EL}	EL switching frequency		900	1000	1100	Hz
V _{DIF}	V _{DC} -V _{EL} (peak)	C _{EL} : 4nF		2.5	5	V
V _{EL-G}	V _{EL} of GND side voltage	When EL charge		2.5	5	V
OSCILLATION CIRCUIT						
f _{CLK}	Internal oscillation frequency		29	32	35	kHz
GATE CONTROL CIRCUIT						
Duty	Switching FET on-time maximum ratio		70	75	80	%
V _{g-on}	High voltage for external switching FET on		10	11.8	V _{CC} -0.5	V
V _{g-off}	Low voltage for external switching FET on				1.5	V

ELECTRICAL CHARACTERISTICS (continued)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
PROTECTION CIRCUIT						
I_{CL1}	Output current	$V_{CCO} \geq 5V$	1.0		1.8	A
I_{CL2}	Start and protection current		60	80	110	mA
I_{limit}	Detection current		1.0	1.5	2	A
T_{limit}	Detection time ($I_{CL1} > I_{limit}$)		$4/f_{CLK}$		$8/f_{CLK}$	s
V_{start1}	V_{CCO} of starting I_{CL1}		4.5	5	5.5	V
V_{start2}	V_{CCO} of starting Gate		6.3	7	7.7	V
T_{j-tds}	T_j of thermal shut down		135		145	°C
SUPPLY CURRENT						
I_{stby}	Stand-by current	$V_{SB}:L$		1	20	μA
I_c	V_{CC} supply mean current (including inductor current)		0.20	0.25	0.30	A

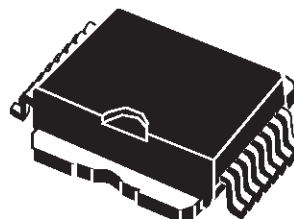
TEST AND APPLICATION CIRCUIT



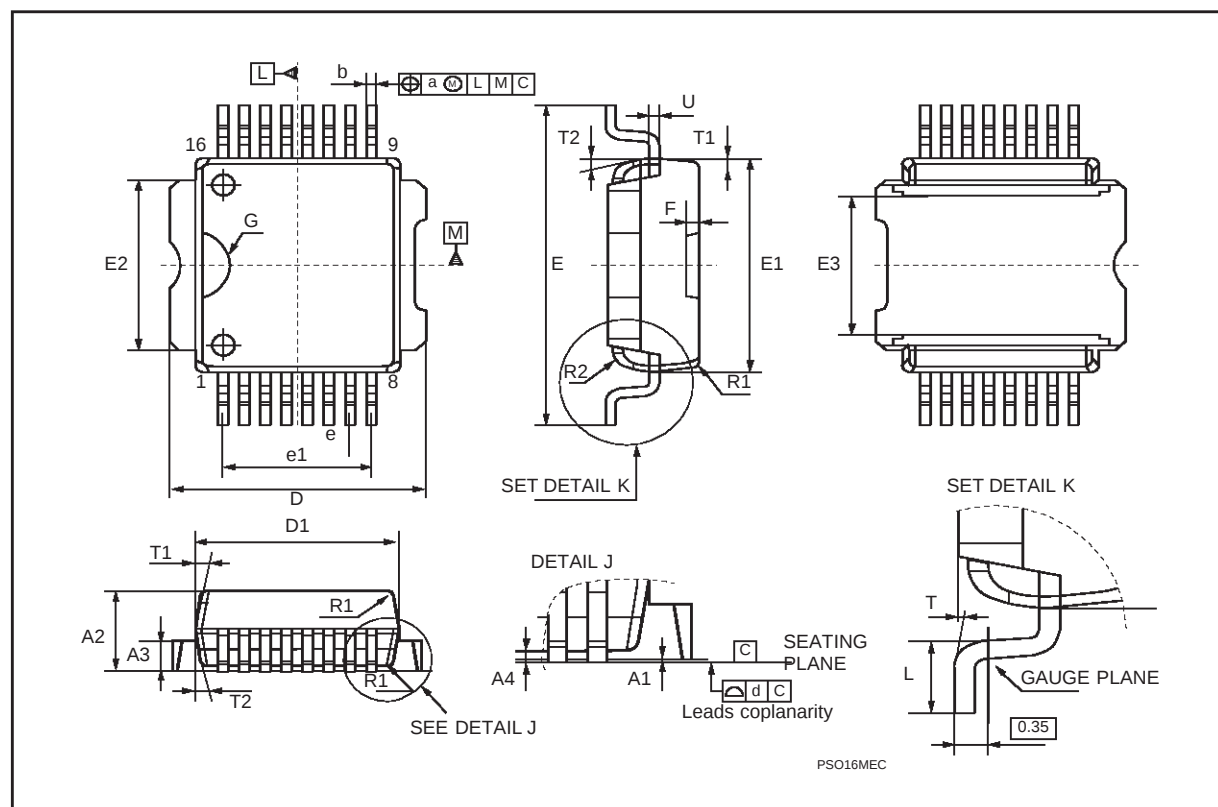
DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A1	0	0.05	0.1	0	0.002	0.004
A2	3.4	3.5	3.6	0.133	0.137	0.141
A3	1.2	1.3	1.4	0.048	0.05	0.052
A4	0.15	0.2	0.25	0.006	0.007	0.01
a		0.2			0.007	
b	0.27	0.35	0.43	0.011	0.013	0.017
c	0.23	0.27	0.32	0.009	0.01	0.012
D	9.4	9.5	9.6	0.37	0.374	0.377
D1	7.4	7.5	7.6	0.291	0.295	0.299
d		0.1			0.004	
E (1)	13.85	14.1	14.35	0.545	0.555	0.565
E1	9.3	9.4	9.5	0.366	0.37	0.374
E2	7.3	7.4	7.5	0.287	0.291	0.295
E3	5.9	6.1	6.3	0.232	0.24	0.248
e		0.8			0.031	
e1		5.6			0.22	
F		0.5			0.019	
G		1.2			0.047	
L	0.8	0.95	1.1	0.031	0.037	0.043
R1			0.25			0.01
R2		0.8			0.031	
T	2° (min.), 5° (typ.), 8° (max.)					
T1	6° (typ.)					
T2	10° (typ.)					

(1) Resin protrusions not included (max value: 0.1mm per side).

OUTLINE AND MECHANICAL DATA



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