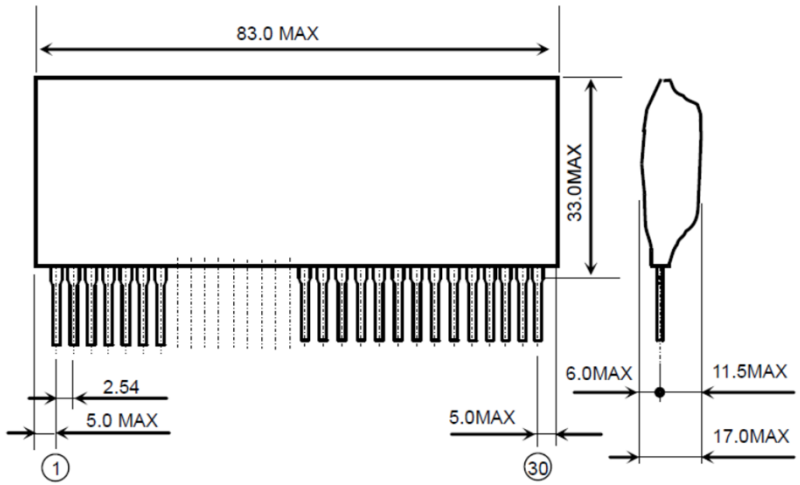
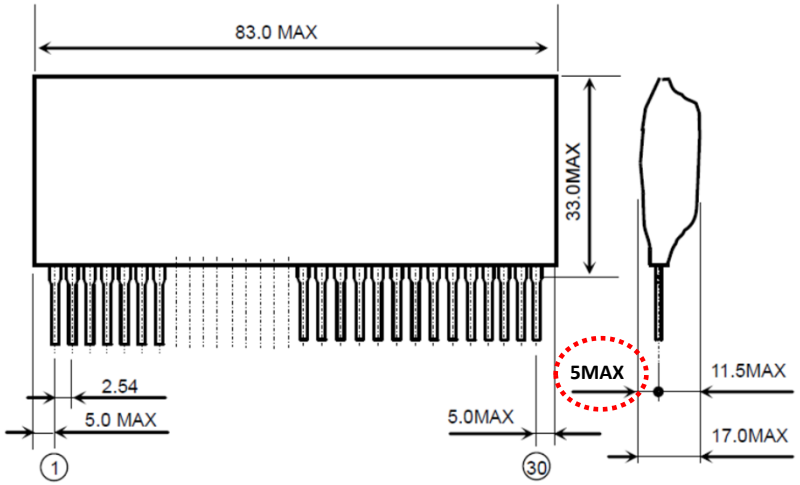
VLA500K-01R V.S. VLA500K-11R outline, block diagram, and electrical characteristics

Outline

VLA500K-01R

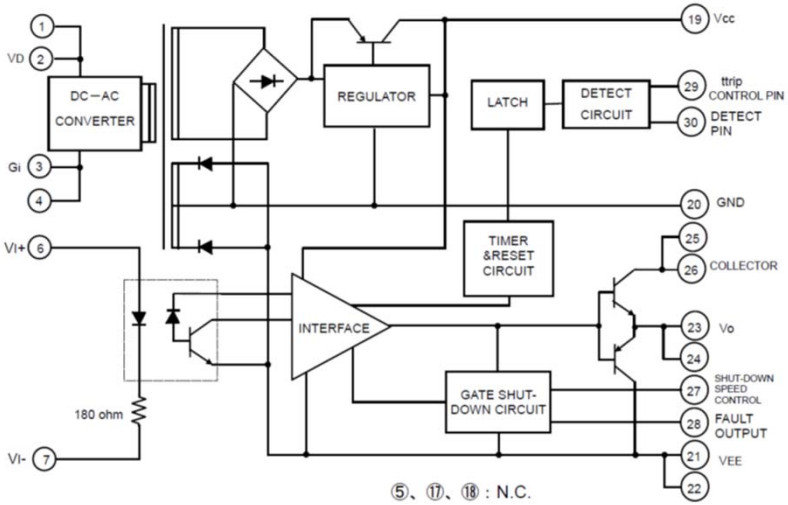


VLA500K-11R

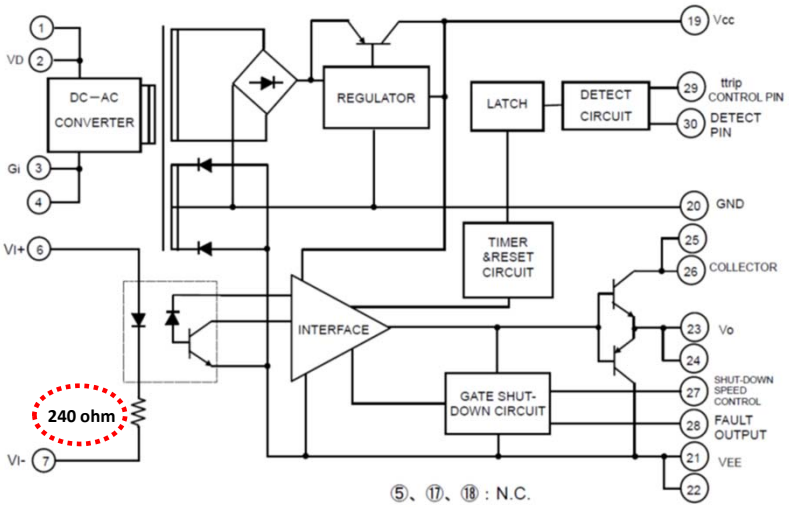


Block diagram

VLA500K-01R



VLA500K-11R



Maximum Ratings (unless otherwise noted, Ta=25°C)

Symbol	Parameter	Conditions	Ratings		Unit
			VLA500K-01R	VLA500K-11R	
V_D	Supply voltage	DC	-1~16.5	-1~16.5	V
V_I	Input signal voltage	Applied between; 6pin and 7pin 50% duty cycle, pulse width 1ms	-1 ~ +7	-7 ~ +7	V
I_{OHP}	Output peak current	Pulse width 2us	-12	-12	A
I_{OLP}			12	12	A
Viso	Isolation voltage	Sine wave voltage 60Hz, for 1minute	4000	4000	Vrms
T_C1	Case temperature1	Surface temperature(opto-coupler mounting part)	85	85	°C
T_C2	Case temperature2	Surface temperature(excepting opto-coupler mounting part)	100	100	°C
Topr	Operating temperature	No condensation allowable	-20 ~ +60	-25 ~ +60	°C
Tstg	Storage temperature	No condensation allowable	-25 ~ +100	-25 ~ +100	°C
I_{FO}	Fault output current	Applied pin 28	20	20	mA
V_{R30}	Input voltage to pin 30	Applied pin 30	50	50	V
Idrive	Gate drive current	Gate average current	210	210	mA

Electrical characterictics (unless otherwise noted, Ta=25°C, V_D=15V, Rg = 2.2Ω)

Symbol	Parameter	Conditions	Limits						Unit
			VLA500K-01R			VLA500K-11R			
			Min	Typ	Max	Min	Typ	Max	
V_D	Supply voltage	Recommended range	14.2	15	15.8	14.2	15	15.8	V
V_{IN}	Pull-up voltage on input side	Recommended range	4.75	5	5.25	4.75	5	5.25	V
I_{IH}	"H" input signal current	Recommended range	15.2	16	19	10	12	16	mA
f	Switching frequency	Recommended range	-	-	20	-	-	20	kHz
R_G	Gate resistance	Recommended range	1	-	-	1	-	-	ohm
I_{IH}	"H" input signal current	V_{IN} = 5V, HCMOS drive	-	16	-	-	12	-	mA
V_{CC}	Gate positive supply voltage	-	15.2	-	17.5	15.2	-	17.5	V
V_{EE}	Gate negative supply voltage	-	-6	-	-11.5	-6	-	-11.5	V
η	Inner power supply efficiency	Load current = 210mA	60	75	-	60	75	-	%
V_{OH}	"H" output voltage	-	14	15.3	16.5	14	15.3	16.5	V
V_{OL}	"L" output voltage	-	-5.5	-	-11	-5.5	-	-11	V
t_{PLH}	"L-H" propagation time	-01R:IIH=16mA, -11R:IIH=12mA	0.3	0.6	1	0.3	-	1	μs
t_r	"L-H" rise time	-01R:IIH=16mA, -11R:IIH=12mA	-	0.3	1	-	0.3	1	μs
t_{PHL}	"H-L" propagation time	-01R:IIH=16mA, -11R:IIH=12mA	0.6	1	1.3	0.3	-	1	μs
t_f	"H-L" fall time	-01R:IIH=16mA, -11R:IIH=12mA	-	0.3	1	-	0.3	1	μs
ttimer	Timer	Between start and cancel (under input signal "OFF")	1	-	2	1	-	2	ms
I_{FO}	Fault output current	Applied 28pin, R = 4.7k ohm	-	5	-	-	5	-	mA
t_{trip1}	Controlled time detect short circuit 1	Pin30:15V and more, Pin29:open	-	2.8	-	-	2.8	-	μs
t_{trip2}	Controlled time detect short circuit 2	Pin30:15V and more, Pin29-21,22:10pF (connective capacitance)	-	3.2	-	-	3.2	-	μs
V_{SC}	SC detect voltage	Collector voltage of IGBT module	15	-	-	15	-	-	V