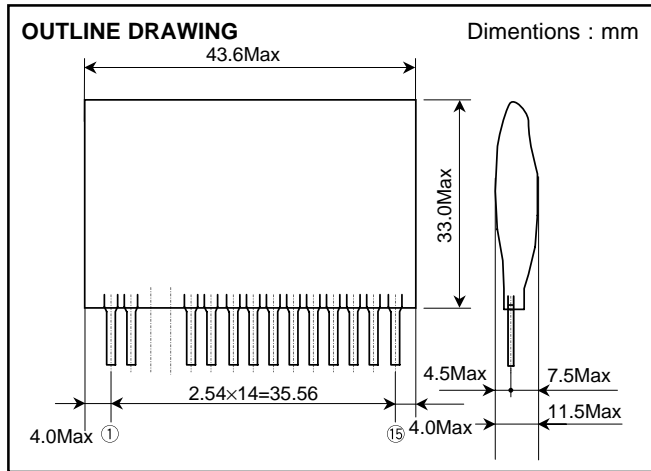


MITSUBISHI HYBRID IC
M57175L-01

HYBRID IC FOR DRIVING IGBT MODULES

DESCRIPTION

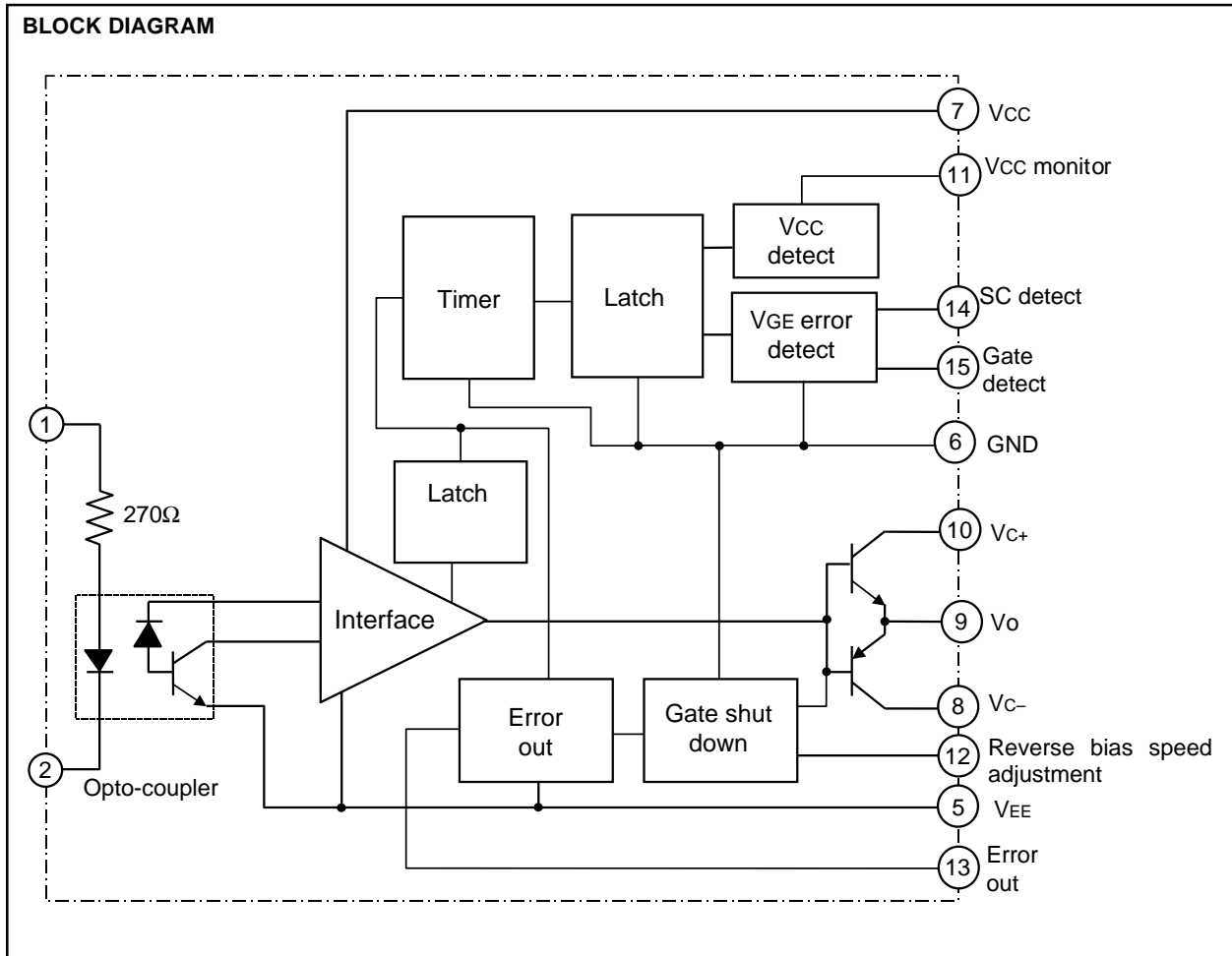
The M57160AL-01 is an optimal hybrid IC to drive trench gate IGBT module with built-in RTC. The protective system of this hybrid IC functions with a margin of time by built in protection circuits to maintain a reverse bias for a predetermined time after the detection of an overcurrent (short-circuit). The overcurrent (short-circuit) detector works with the RTC circuit built in IGBT module to detect a drop in this gate voltage for protection. If a gate pin of IGBT is connected with a detective pin of this hybrid IC, there is no need to use high withstand-voltage and high-speed diode or protective Zener diode for monitoring a collector voltage of IGBT.



Recommended module ; IGBT module with built-in RTC circuit (Mitsubishi F series)
 1200V(600V) ~200A(400A)

FEATURES

- Over current(short-circuit)protector built-in(with timer-operated circuit and reset circuit)
- Input-output isolation voltage : 2500Vrms for 1 min



ABSOLUTE MAXIMUM RATINGS (Unless otherwise specified, Ta = 25°C)

Symbol	Parameter	Conditions	Ratings	Unit
VCC	Supply voltage 1		19	V
VEE	Supply voltage 2		-8	V
VI	Input voltages	Applied between:①-②	-1 ~ +7	V
Vo	Output voltages	At the output voltage "H" VD=15.7V	16.5	V
IOHP	Output current	Pulse width 1μs, f≤20kHz	-3.5	A
IOLP			3.5	A
Viso	Isolation voltage	Sine-wave voltage 60Hz, 1min	2500	Vrms
Tc	Case temperature		85	°C
Topr	Operating temperature		-20 ~ +60	°C
Tstg	Storage temperature		-25 ~ +100	°C
Ifo	Fault output current	Input current ⑬pin	25	mA
VR	Applied ⑮ pin		VCC	V

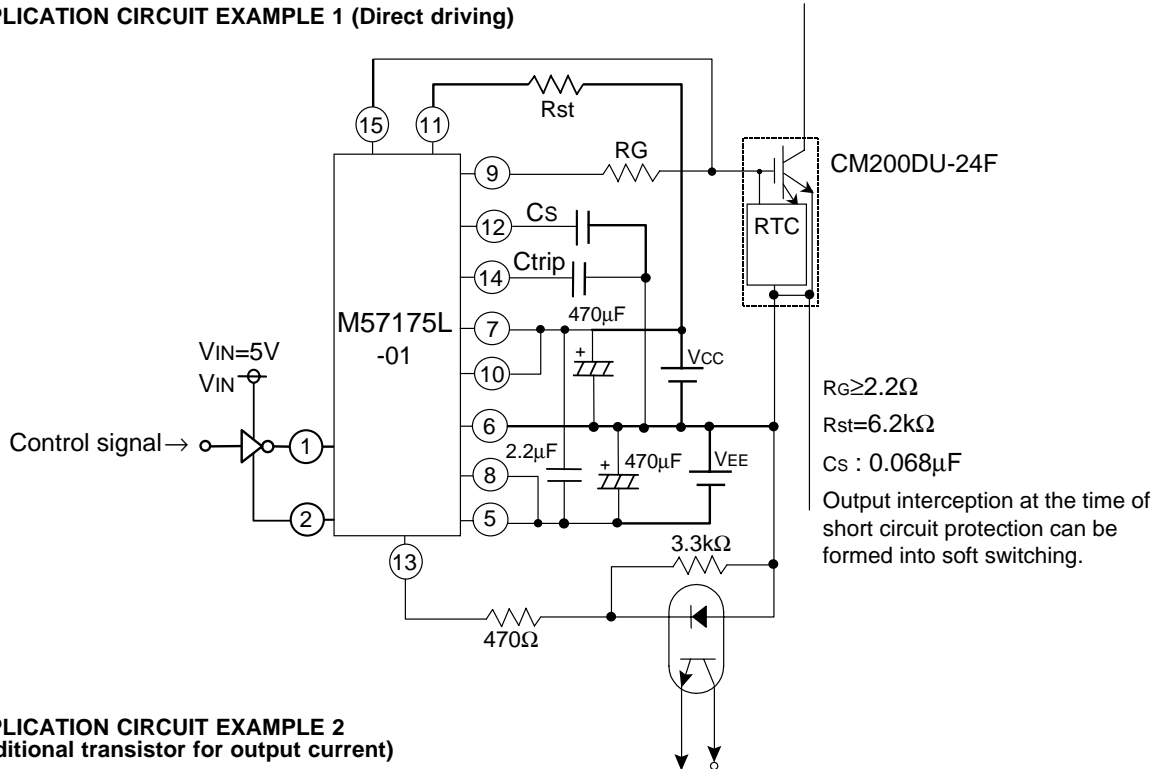
ELECTRICAL CHARACTERISTICS (Ta = 25°C, Vcc = 17.5V, Vee = -6.5V, VIN = 5.0V, f = 20kHz, Rg = 2.2Ω : CM200HU-24F)

Symbol	Parameter	Test conditions	Limits			Units
			Min.	Typ.	Max.	
VCC	Supply voltage 1	Recommended range	17.0	17.5	18	V
VEE	Supply voltage 2	Recommended range	-5.5	-6.5	-7.5	V
VIN	Pull-up voltage on input side	Recommended range	4.5	5.0	5.5	V
IiH	"H" Input current	Recommended range	11	13.5	16	mA
f	Switching frequency	Recommended range	—	—	20	kHz
RG	Gate resistor	Recommended range	6.8	—	—	Ω
IiH	"H" Input current	VIN=5V	—	13.5	—	mA
VOH	"H" output voltage		14	15.5	16.5	V
VOL	"L" output voltage		-4.0	-5.0	-6.0	V
t PLH	"L-H" Propagation time	IiH=13.5mA	—	0.5	1	μs
t r	"L-H" Rise time	IiH=13.5mA	—	0.4	0.8	μs
t PHL	"H-L" Propagation time	IiH=13.5mA	—	1.0	2.0	μs
t f	"H-L" Fall time	IiH=13.5mA	—	0.4	0.8	μs
t timer	Timer	Between start and cancel(Under input signal "L")	1.5	—	2.5	ms
Ifo	Fault output current	Applied ⑬pin R=470Ω	—	12	—	mA
t d	Short-circuit protect delay time	In the rise time ⑮pin :11V, ⑯, ⑰pin :open	—	3.6	—	μs
VCL	Start voltage for protection at lower Vcc	Rst=6.2kΩ Please refer to the example of an application circuit.	—	15.5	—	V
Vsc	Over-current detect voltage	⑮pin	11.0	11.6	12.2	V

M57175L-01

HYBRID IC FOR DRIVING IGBT MODULES

APPLICATION CIRCUIT EXAMPLE 1 (Direct driving)



APPLICATION CIRCUIT EXAMPLE 2 (Additional transistor for output current)

