

MTD2009J SPECIFICATION

Absolute maximum ratings(Ta=25°C)

Parameter	Symbol	Rating	Unit
Logic	Logic supply	VCC	0~6
	Logic inputs	VIN, VENA	0~VCC
Output	Output voltage	VCEO(SUS)	35
	Output current	IC	1.2
Temperature	Storage temperature	Tstg	-40~150
	Junction temperature	TJ	150

Electrical characteristics(Ta=25°C)

Output stage

Parameter	Symbol	Conditions	MIN	TYP	MAX	Unit
Motor supply	Vmm		5	-	35	V
Output leakage current	Ir	Vmm=35V,or Vout=35V	-	-	20	μA
Upper Tr saturation voltage	VCE(sat)H	Io=0.8A	-	1.20	1.50	V
Lower Tr saturation voltage	VCE(sat)L	Io=0.8A	-	0.70	1.00	V
Upper diode forward voltage drop	VFH	Io=0.8A	-	1.30	1.60	V
Lower diode forward voltage drop	VFL	Io=0.8A	-	1.30	1.50	V
Output stage supply current (ImmA+B or ImmC+D)	Imm(OFF)1	Vmm=24V,ENA=2.1V,no load	-	-	7	mA
Output stage supply current (ImmA+B+C+D)	Imm(OFF)2	Vmm=24V,ENA=2.1V,no load	-	-	14	mA

				MANAGER <i>T. Wakabayashi</i>	Type Name:	MTD2009J	
I	Oct.23.1998	Y.I	Newly	CHKD <i>H. Higuchi</i>	Code No:	4002	
	DATE	DEGD	DESCRIPTION	DEGD <i>Y. Ishida</i>	DWG. No:	1SK-97243	EDIT -1
SHINDENGEN ELECTRIC MFG.CO.,LTD JAPAN							

8503

8219387 0005103 B&T

1 / 4 SHEET

Logic part

Parameter	Symbol	Conditions	MIN	TYP	MAX	Unit
Logic supply	Vcc		4.5	-	5.5	V
Logic supply current (Vcc1+Vcc2)	Icc(OFF)	Vcc=5V,ENA="H"	-	36	52	mA
	Icc(ON)	Vcc=5V,ENA="L"	-	95	135	mA
"Phase" input voltage	Vpha H	Vcc=5V	2.10	-	Vcc	V
	Vpha L	Vcc=5V	GND	-	0.80	V
"Phase" input current	Ipha H	Vcc=5V,PHA=5V	-	-	20	μA
	Ipha L	Vcc=5V,PHA=0V	-	-100	-200	μA
"ENA" input voltage	VENA H	Vcc=5V	2.10	-	Vcc	V
	VENA L	Vcc=5V	GND	-	0.80	V
"ENA" input current	IENA H	Vcc=5V,ENA=5V	-	-	20	μA
	IENA L	Vcc=5V,ENA=0V	-	-100	-200	μA
"DEC" input voltage	VDEC H	Vcc=5V	2.10	-	Vcc	V
	VDEC L	Vcc=5V	GND	-	0.80	V
"DEC" input current	IDEC H	Vcc=5V,DEC=5V	-	-	20	μA
	IDEC L	Vcc=5V,DEC=0V	-	-100	-200	μA
Oscillator charge current	ICR	Vcc=5V,VCR=2V	-	-1	-	mA
"Vref" input voltage	Vref	Vcc=5V	-	-	1.0	V
"Vref" input current	Iref	Vcc=5V,Vref=0V	-	-1	-10	μA
Blanking time	tb	Vcc=5V,Rt=30kΩ,Ct=1000pF	-	2.14	-	μs
Thermal shut down temperature		Vcc=5V	-	150	-	°C

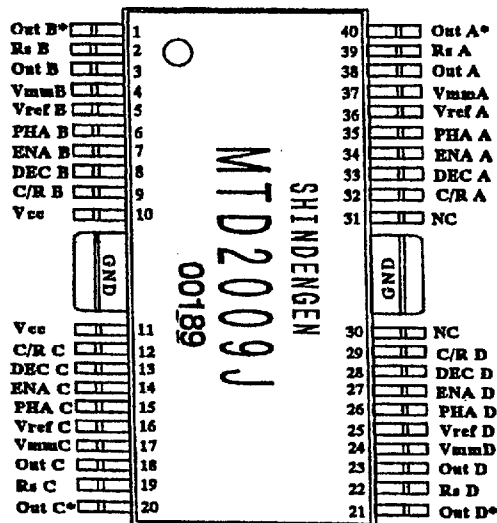
One shot off time

$$T_{off}=1.163 \cdot C_t \cdot R_t$$

Blanking time

$$t_b = C_t \cdot R_t \cdot \ln \frac{1-R_t/1000}{3-R_t/1000}$$

Pin configuration



Truth table

ENA A or B or C or D	PHA A or B or C or D	OUT A or B or C or D	OUT A* or B* or C* or D*
L	L	L	H
L	H	H	L
H	X	OFF	OFF

X : don't care

Decay mode selection

DECAY	Current decay mode
L	Fast decay
H	Slow decay

Slow decay should be usually selected.
Fast decay will be required in half step
or micro step application to avoid motor
current dragging.

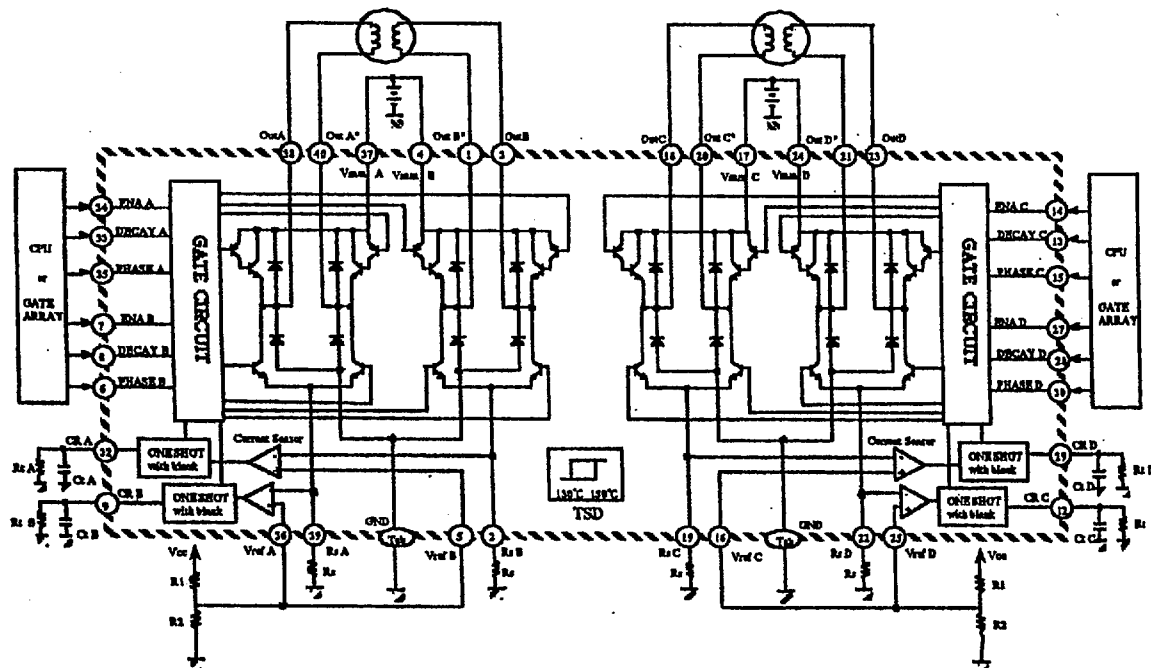
SHINDENGEN ELECTRIC MFG.CO.,LTD JAPAN	Type Name: MTD2009J	- 1 EDIT
	DWG. No: 1SK-97243	

8503

8219387 0005104 7TB

2/4 SHEET

Block diagram & Typical application



Recommended external component value

Symbol	Recommended value	Unit
R_s	0.68	Ω
R_t	30k	Ω
C_t	1000p	F
R_1+R_2	<10k	Ω

SHINDENGEN ELECTRIC MFG.CO.,LTD
JAPAN

Type Name: MTD2009J

DWG. No: 1SK-97243

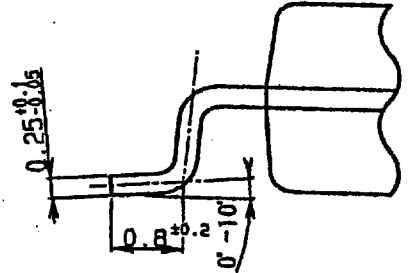
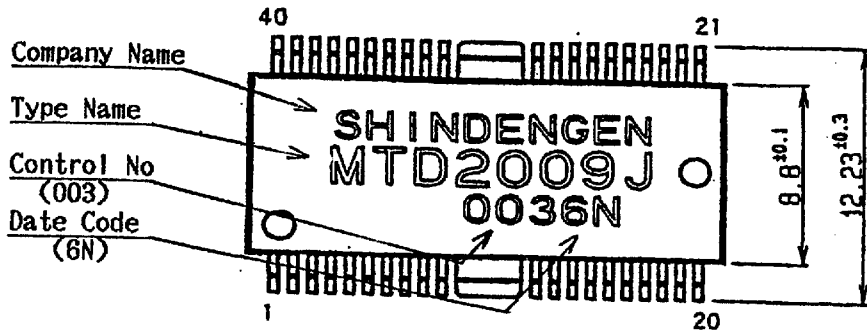
- 1 EDIT

8503

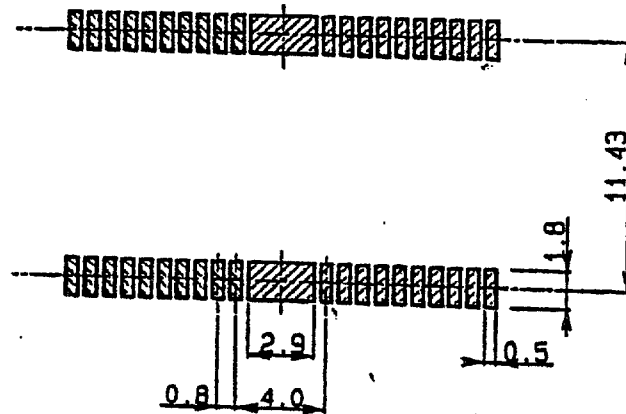
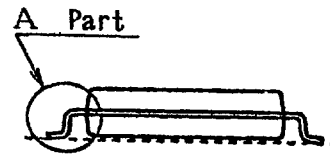
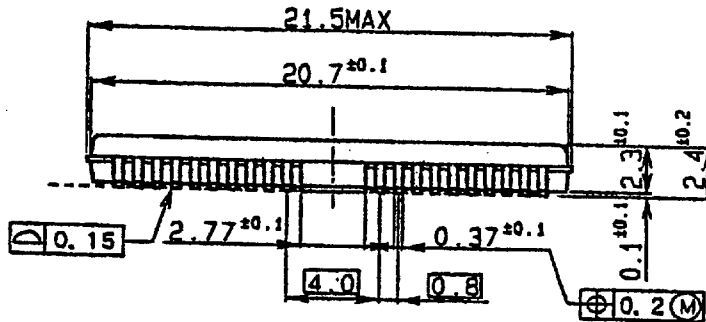
8219387 0005105 632

3/4 SHEET

Outline dimension



A Part S=12/1



Standard soldering pad

SHINDENGEN ELECTRIC MFG.CO.,LTD JAPAN	Type Name: MTD2009J	
	DWG. No: 1SK-87243	- 1 EDIT

3503

8219387 0005106 579

4/4 SHEET