Q5 代替検討 SMD型に変更
現行品使用型番 :KSD1588 onsemi
詳細
・NPN トランジスタ

**Absolute Maximum Ratings** $T_C$=25℃ unless otherwise noted

| Symbol | Parameter | Value | Units |
|---|---|---|---|
| $V_{CBO}$ | Collector-Base Voltage | 100 | V |
| $V_{CEO}$ | Collector-Emitter Voltage | 60 | V |
| $V_{EBO}$ | Emitter-Base Voltage | 7 | V |
| $I_C$ | Collector Current (DC) | 7 | A |
| $I_{CP}$ | *Collector Current (Pulse) | 15 | A |
| $I_B$ | Base Current | 3.5 | A |
| $P_C$ | Collector Dissipation ($T_a$=25℃) | 2 | W |
| $P_C$ | Collector Dissipation ($T_C$=25℃) | 30 | W |
| $T_J$ | Junction Temperature | 150 | ℃ |
| $T_{STG}$ | Storage Temperature | -55 ~ 150 | ℃ |

* PW≤300μs, Duty Cycle≤10%

**Electrical Characteristics** $T_C$=25℃ unless otherwise noted

| Symbol | Parameter | Test Condition | Min. | Max. | Units |
|---|---|---|---|---|---|
| $I_{CBO}$ | Collector Cut-off Current | $V_{CB}$ = 80V, $I_E$ = 0 | | 10 | μA |
| $I_{EBO}$ | Emitter Cut-off Current | $V_{EB}$ = 5V, $I_C$ = 0 | | 10 | μA |
| $h_{FE1}$<br>$h_{FE2}$ | *DC Current Gain | $V_{CE}$ = 1V, $I_C$ = 3A<br>$V_{CE}$ = 1V, $I_C$ = 5A | 40<br>20 | 200 | |
| $V_{CE}$(sat) | *Collector-Emitter Saturation Voltage | $I_C$ = 5A, $I_B$ = 0.5A | | 0.5 | V |
| $V_{BE}$(sat) | *Base-Emitter Saturation Voltage | $I_C$ = 5A, $I_B$ = 0.5A | | 1.5 | V |

代替型番 DPak(TO-252-3)
NJVMJD44H11RLG onsemi
MJD44H11AJ Nexperia
MJD41C-QJ Nexperia

Q6 代替検討 SMD型に変更
現行品使用型番 :KSB1097 Fairchild Semiconductor
詳細
・PNP トランジスタ

**Absolute Maximum Ratings** $T_C$=25℃ unless otherwise noted

| Symbol | Parameter | Value | Units |
|---|---|---|---|
| $V_{CBO}$ | Collector-Base Voltage | - 80 | V |
| $V_{CEO}$ | Collector-Emitter Voltage | - 60 | V |
| $V_{EBO}$ | Emitter-Base Voltage | - 7 | V |
| $I_C$ | Collector Current (DC) | - 7 | A |
| $I_{CP}$ | *Collector Current (Pulse) | - 15 | A |
| $I_B$ | Base Current | - 3.5 | A |
| $P_C$ | Collector Dissipation ($T_a$=25℃) | 2 | W |
| $P_C$ | Collector Dissipation ($T_C$=25℃) | 30 | W |
| $T_J$ | Junction Temperature | 150 | ℃ |
| $T_{STG}$ | Storage Temperature | - 55 ~ 150 | ℃ |

* PW≤300μs, Duty Cycle≤10%

**Electrical Characteristics** $T_C$=25℃ unless otherwise noted

| Symbol | Parameter | Test Condition | Min. | Max. | Units |
|---|---|---|---|---|---|
| $I_{CBO}$ | Collector Cut-off Current | $V_{CB}$ = - 60V, $I_E$ = 0 | | - 10 | μA |
| $I_{EBO}$ | Emitter Cut-off Current | $V_{EB}$ = - 5V, $I_C$ = 0 | | - 10 | μA |
| $h_{FE1}$<br>$h_{FE2}$ | * DC Current Gain | $V_{CE}$ = - 1V, $I_C$ = - 3A<br>$V_{CE}$ = - 1V, $I_C$ = - 5A | 40<br>20 | 200 | |
| $V_{CE}$(sat) | Collector-Emitter Saturation Voltage | $I_C$ = - 5A, $I_B$ = - 0.5A | | - 0.5 | V |
| $V_{BE}$(sat) | * Base-Emitter Saturation Voltage | $I_C$ = - 5A, $I_B$ = - 0.5A | | - 1.5 | V |

* Pulse Test: PW≤350μs, Duty Cycle≤2% Pulsed

代替型番 DPak(TO-252-3)
MJD45H11AJ Nexperia
MJD45H11J Nexperia
MJD2955T4G onsemi
MJD45H11T4G onsemi
NJVMJD45H11G onsemi
※TAB=コレクタ

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TC106_v012.SchDoc

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| Title | | |
| Size A4 | Number | Revision |
| Date: 2023/06/28 | | Sheet 1 of 2 |
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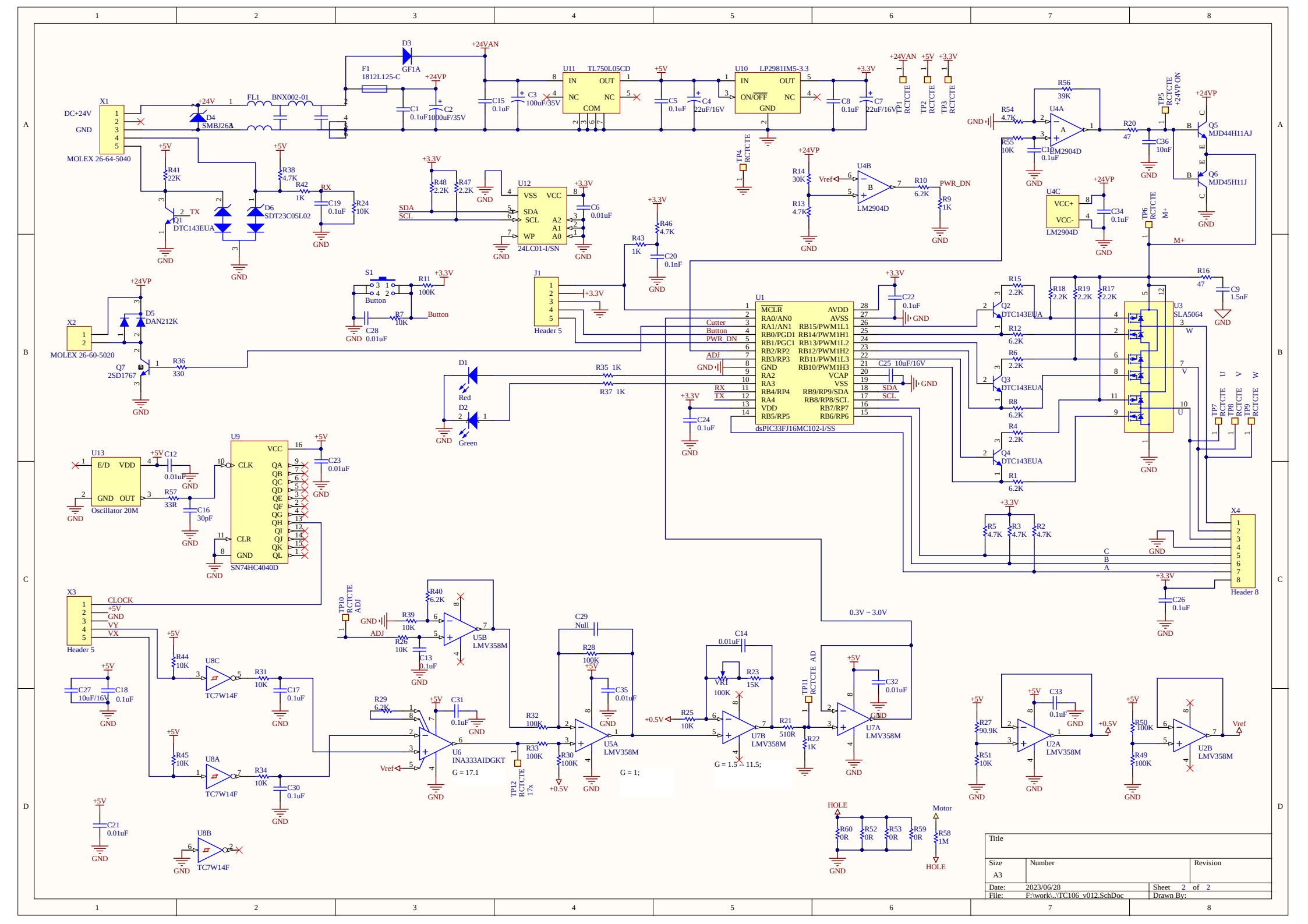
X1
DC+24V
GND
MOLEX 26-64-5040
+24V
FL1
BNX002-01
D4
SMBJ26A
D3
GF1A
F1
1812L125-C
+24VP
+24VAN
C1
0.1uF
C2
1000uF/35V
U11
TL750L05CD
IN
OUT
NC
COM
C15
0.1uF
C3
100uF/35V
+5V
C5
0.1uF
C4
22uF/16V
U10
LP2981IM5-3.3
ON/OFF
C8
0.1uF
C7
22uF/16V
+3.3V
TP1
RCTCTE
TP2
TP3
R41
22K
R38
4.7K
R42
1K
RX
C19
0.1uF
R24
10K
Q1
DTC143EUA
2_TX
D6
SDT23C05L02
R48
2.2K
R47
2.2K
SDA
SCL
U12
VSS
VCC
A2
A1
A0
WP
24LC01-I/SN
C6
0.01uF
TP4
R14
30K
R13
4.7K
U4B
Vref
LM2904D
R10
6.2K
PWR_DN
R9
1K
R56
39K
R54
4.7K
U4A
R55
10K
C18
0.1uF
R20
47
C36
10nF
TP5
+24VP ON
Q5
MJD44H11AJ
Q6
MJD45H11J
U4C
VCC+
VCC-
C34
0.1uF
TP6
M+
X2
MOLEX 26-60-5020
D5
DAN212K
Q7
2SD1767
R36
330
S1
Button
R11
100K
R7
10K
C28
0.01uF
J1
Header 5
R43
1K
R46
4.7K
C20
0.1nF
U1
dsPIC33FJ16MC102-I/SS
MCLR
AVDD
AVSS
RA0/AN0
RA1/AN1
RB0/PGD1
RB1/PGC1
RB2/RP2
RB3/RP3
GND
RA2
RA3
RB4/RP4
RA4
VDD
RB5/RP5
RB15/PWM1L1
RB14/PWM1H1
RB13/PWM1L2
RB12/PWM1H2
RB11/PWM1L3
RB10/PWM1H3
VCAP
VSS
RB9/RP9/SDA
RB8/RP8/SCL
RB7/RP7
RB6/RP6
Cutter
Button
PWR_DN
ADJ
RX
TX
C22
0.1uF
C25 10uF/16V
C24
0.1uF
D1
Red
D2
Green
R35 1K
R37 1K
R15
2.2K
R18
2.2K
R19
2.2K
R17
2.2K
R16
47
C9
1.5nF
Q2
DTC143EUA
R12
6.2K
R6
Q3
R8
R4
Q4
R1
U3
SLA5064
W
V
U
TP7
TP8
TP9
X4
Header 8
C26
0.1uF
U13
E/D
VDD
GND
OUT
Oscillator 20M
C12
0.01uF
R57
33R
C16
30pF
U9
CLK
CLR
QA
QB
QC
QD
QE
QF
QG
QH
QI
QJ
QK
QL
SN74HC4040D
C23
0.01uF
X3
CLOCK
VY
VX
Header 5
R44
10K
U8C
TC7W14F
R31
10K
C17
0.1uF
C27
10uF/16V
R45
10K
U8A
R34
10K
C30
0.1uF
C21
0.01uF
U8B
TP10
ADJ
R40
6.2K
R39
10K
R26
10K
C13
0.1uF
U5B
LMV358M
R29
6.2K
C31
0.1uF
U6
INA333AIDGKT
G = 17.1
Vref
TP12
17x
R32
100K
R33
100K
R30
100K
C29
Null
R28
100K
C35
0.01uF
U5A
LMV358M
0.3V ~ 3.0V
C14
0.01uF
R23
15K
VR1
100K
R25
10K
+0.5V
U7B
LMV358M
R21
510R
R22
1K
G = 1.5 ~ 11.5;
TP11
AD
U7A
LMV358M
C32
0.01uF
G = 1;
HOLE
R60
0R
R52
0R
R53
0R
R59
0R
Motor
R58
1M
R27
90.9K
R51
10K
C33
0.1uF
U2A
LMV358M
R50
100K
R49
100K
U2B
LMV358M
Title
Size
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Number
Revision
Date:
2023/06/28
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