TAIGITON

MMDT5551DW

SOT-363 Plastic-Encapsulate Transistors

MMDT5551DW DUAL TRANSISTOR (NPN+NPN)

FEATURES

- Complementary to MMDT5401DW
- Small Surface Mount Package
- Ideal for Medium Power Amplification and Switching
  MARKING:G1

SOT-363

MAXIMUM RATINGS (T$_a$=25℃ unless otherwise noted)

Symbol	Parameter	Value	Unit
V$_{CBO}$	Collector-Base Voltage	180	V
V$_{CEO}$	Collector-Emitter Voltage	160	V
V$_{EBO}$	Emitter-Base Voltage	6	V
I$_C$	Collector Current	600	mA
P$_C$	Collector Power Dissipation	300	mW
R$_{ΘJA}$	Thermal Resistance From Junction To Ambient	625	℃/W
T$_j$	Junction Temperature	150	℃
T$_{stg}$	Storage Temperature	-55～+150	℃
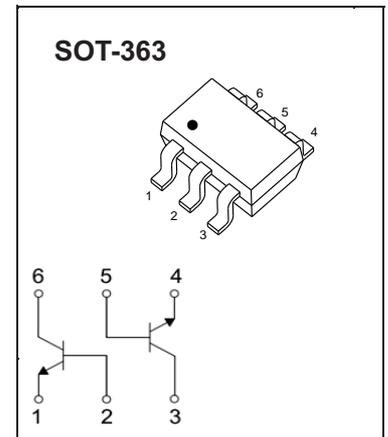
ELECTRICAL CHARACTERISTICS (T$_a$=25℃ unless otherwise specified)

Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Collector-base breakdown voltage	V$_{(BR)CBO}$	I$_C$=100µA, I$_E$=0	180			V
Collector-emitter breakdown voltage	V$_{(BR)CEO}$*	I$_C$=1mA, I$_B$=0	160			V
Emitter-base breakdown voltage	V$_{(BR)EBO}$	I$_E$=10µA, I$_C$=0	6			V
Collector cut-off current	I$_{CBO}$	V$_{CB}$=120V, I$_E$=0			50	nA
Emitter cut-off current	I$_{EBO}$	V$_{EB}$=4V, I$_C$=0			50	nA
DC current gain	h$_{FE}$	V$_{CE}$=5V, I$_C$=1mA	80			
		V$_{CE}$=5V, I$_C$=10mA	80		300	
		V$_{CE}$=5V, I$_C$=50mA	30			
Collector-emitter saturation voltage	V$_{CE(sat)}$	I$_C$=50mA, I$_B$=5mA			0.2	V
		I$_C$=10mA, I$_B$=1mA			0.15	V
Base-emitter saturation voltage	V$_{BE(sat)}$	I$_C$=50mA, I$_B$=5mA			1	V
		I$_C$=10mA, I$_B$=1mA			1	V
Transition frequency	f$_T$	V$_{CE}$=10V,I$_C$=10mA , f=100MHz	100		300	MHz
Collector output capacitance	C$_{ob}$	V$_{CB}$=10V, I$_E$=0, f=1MHz			6	pF

*Pulse test: pulse width ≤300µs, duty cycle≤ 2.0%.
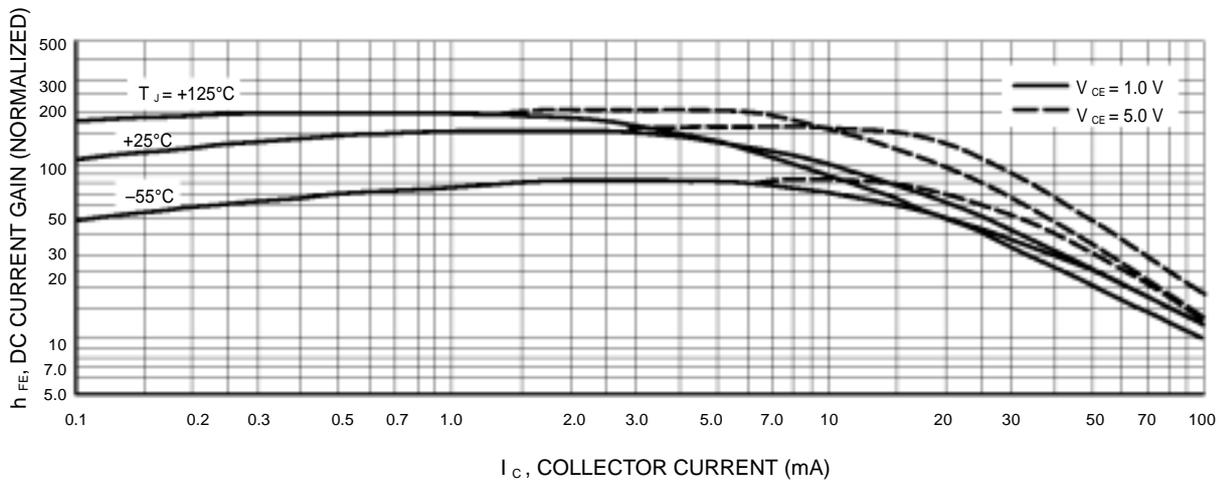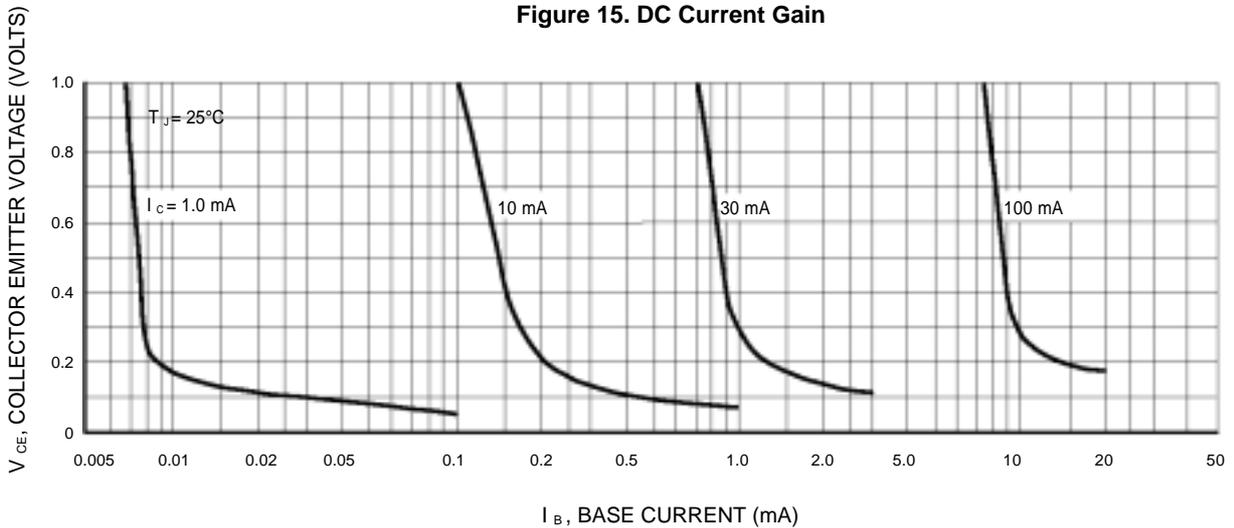
Figure 15. DC Current Gain

h_{FE}, DC CURRENT GAIN (NORMALIZED)

$T_J = +125°C$

$+25°C$

$-55°C$

$V_{CE} = 1.0$ V
$V_{CE} = 5.0$ V

I_C, COLLECTOR CURRENT (mA)

Figure 16. Collector Saturation Region

V_{CE}, COLLECTOR EMITTER VOLTAGE (VOLTS)

$T_J = 25°C$

$I_C = 1.0$ mA

10 mA

30 mA

100 mA

I_B, BASE CURRENT (mA)
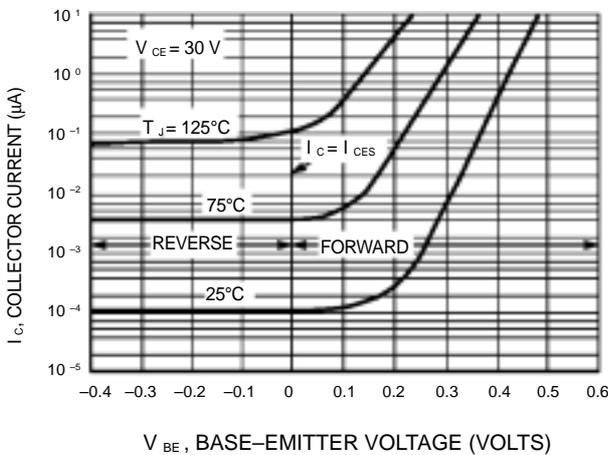
Figure 3. Collector Cut–Off Region

I_C, COLLECTOR CURRENT (μA)

$V_{CE} = 30$ V

$T_J = 125°C$

$I_C = I_{CES}$

$75°C$

REVERSE   FORWARD

$25°C$

V_{BE}, BASE–EMITTER VOLTAGE (VOLTS)

Figure 4. "On" Voltages

V, VOLTAGE (VOLTS)

$T_J = 25°C$

$V_{BE(sat)}$ @ $I_C/I_B = 10$

$V_{CE(sat)}$ @ $I_C/I_B = 10$

I_C, COLLECTOR CURRENT (mA)
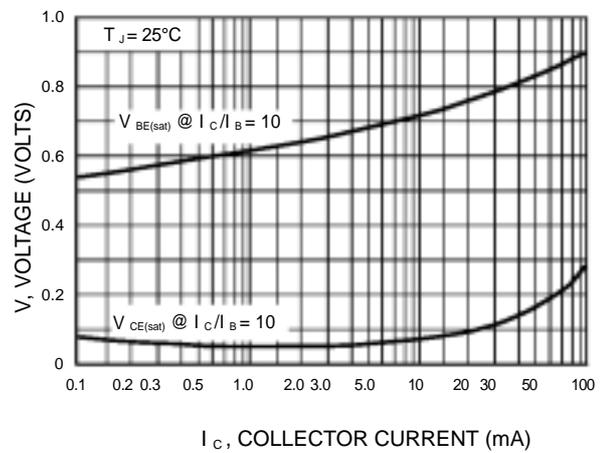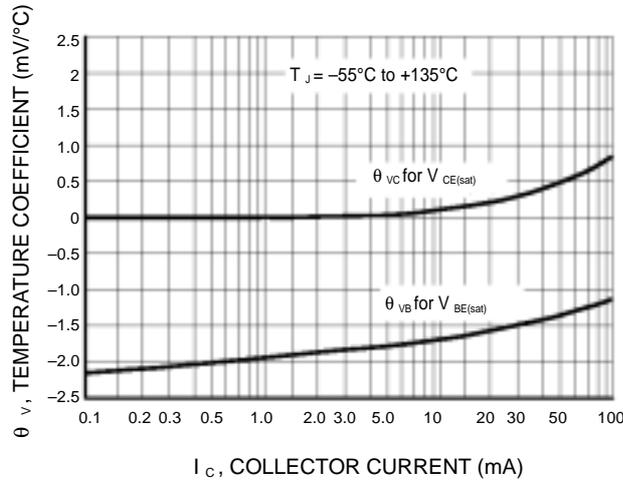
Figure 5. Temperature Coefficients

$T_J = -55°C$ to $+135°C$

θ_{VC} for $V_{CE(sat)}$

θ_{VB} for $V_{BE(sat)}$

θ_V, TEMPERATURE COEFFICIENT (mV/°C)

I_C, COLLECTOR CURRENT (mA)

10.2 V

V_{in}

10 ms

INPUT PULSE

t_r, $t_f \leq 10$ ns
DUTY CYCLE = 1.0%

V_{in}

V_{BB} ⊙ −8.8 V

100

0.25 mF R_B

5.1 k

100   1N914

V_{CC} ⊙ 30 V

3.0 k R_C

V_{out}
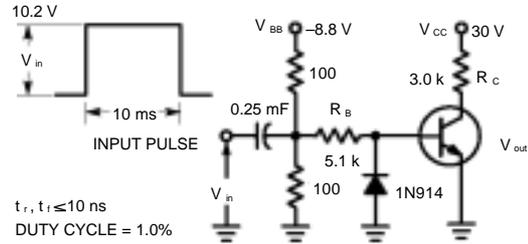
Values Shown are for I_C @ 10 mA

Figure 6. Switching Time Test Circuit
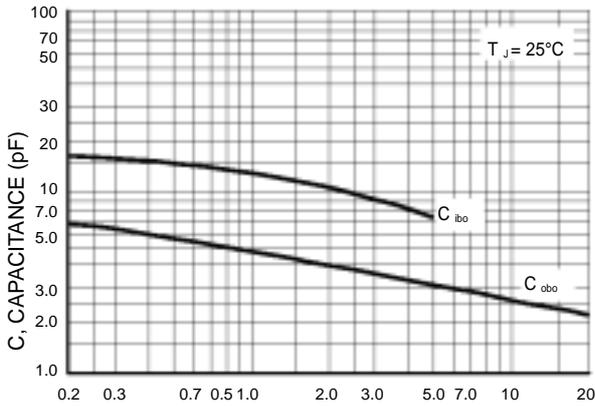
Figure 7. Capacitances Figure

$T_J = 25°C$

C_{ibo}

C_{obo}

C, CAPACITANCE (pF)

V_R, REVERSE VOLTAGE (VOLTS)

8. Turn–On Time

$I_C/I_B = 10$
$T_J = 25°C$

t_r @ $V_{CC} = 120$ V

t_r @ $V_{CC} = 30$ V

t_d @ $V_{EB(off)} = 1.0$ V

$V_{CC} = 120$ V

t, TIME (ns)

I_C, COLLECTOR CURRENT (mA)

Figure 9. Turn–Off Time

t_f @ $V_{CC} = 120$ V

t_f @ $V_{CC} = 30$ V

t_s @ $V_{CC} = 120$ V

$I_C/I_B = 10$
$T_J = 25°C$

t, TIME (ns)

I_C, COLLECTOR CURRENT (mA)