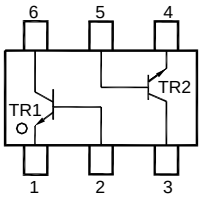
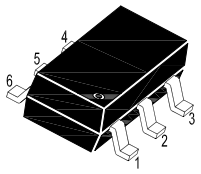
■ NPN Silicon General Purpose Double Transistor

for switching and amplifier applications.





1. Emitter 2. Base 3. Collector
4. Emitter 5. Base 6. Collector

■ **Simplified outline(SOT-363)**

Marking Code	
MMDT3904DW	**K6 N**

■ Absolute Maximum Ratings (T_a = 25℃)

Parameter	Symbol	Value	Unit
Collector Base Voltage	V_{CBO}	60	V
Collector Emitter Voltage	V_{CEO}	40	V
Emitter Base Voltage	V_{EBO}	6	V
Collector Current	I_C	200	mA
Power Dissipation	P_{tot}	200	mW
Junction Temperature	T_j	150	℃
Storage Temperature Range	T_{stg}	- 55 to + 150	℃

■ Characteristics at T_a = 25℃

Parameter	Symbol	Min.	Max.	Unit
DC Current Gain at V_{CE} = 1 V, I_C = 0.1 mA at V_{CE} = 1 V, I_C = 1 mA at V_{CE} = 1 V, I_C = 10 mA at V_{CE} = 1 V, I_C = 50 mA at V_{CE} = 1 V, I_C = 100 mA	 h_{FE} h_{FE} h_{FE} h_{FE} h_{FE}	 40 70 100 60 30	 - - 300 - -	 - - - - -
Collector Base Cutoff Current at V_{CE} = 30 V	I_{CES}	-	50	nA
Emitter Base Cutoff Current at V_{EB} = 3 V	I_{EBO}	-	50	nA
Collector Base Breakdown Voltage at I_C = 10 μA	$V_{(BR)CBO}$	60	-	V
Collector Emitter Breakdown Voltage at I_C = 1 mA	$V_{(BR)CEO}$	40	-	V
Emitter Base Breakdown Voltage at I_E = 10 μA	$V_{(BR)EBO}$	6	-	V
Collector Emitter Saturation Voltage at I_C = 10 mA, I_B = 1 mA at I_C = 50 mA, I_B = 5 mA	 $V_{CE(sat)}$ $V_{CE(sat)}$	 - -	 0.2 0.3	 V V
Base Emitter Saturation Voltage at I_C = 10 mA, I_B = 1 mA at I_C = 50 mA, I_B = 5 mA	 $V_{BE(sat)}$ $V_{BE(sat)}$	 0.65 -	 0.85 0.95	 V V
Current Gain Bandwidth Product at V_{CE} = 20 V, -I_E = 10 mA, f = 100 MHz	f_T	300	-	MHz
Collector Output Capacitance at V_{CB} = 10 V,f = 100 MHz	C_{ob}	-	4	pF
Delay Time at V_{CC} = 3 V, $V_{BE(OFF)}$ = 0.5 V, I_C = 10 mA, I_{B1} = 1 mA	t_d	-	35	ns
Rise Time at V_{CC} = 3 V, $V_{BE(OFF)}$ = 0.5 V, I_C = 10 mA, I_{B1} = 1 mA	t_r	-	35	ns
Storage Time at V_{CC} = 3 V, I_C = 10 mA, I_{B1} = -I_{B2} = 1 mA	t_{stg}	-	200	ns
Fall Time at V_{CC} = 3 V, I_C = 10 mA, I_{B1} = -I_{B2} = 1 mA	t_f	-	50	ns

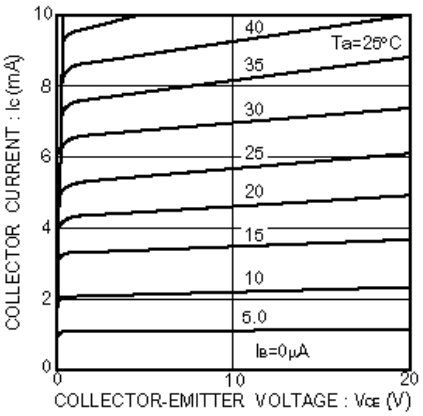


Fig.1 Grounded emitter output characteristics

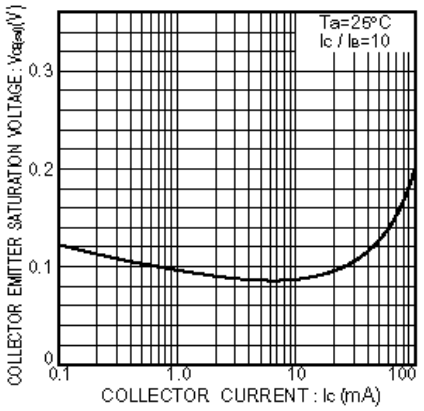


Fig.2 Collector-emitter saturation voltage vs. collector current

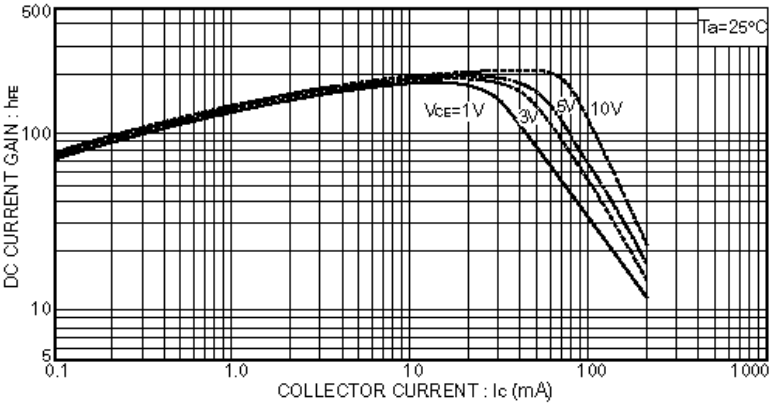


Fig.3 DC current gain vs. collector current (I)

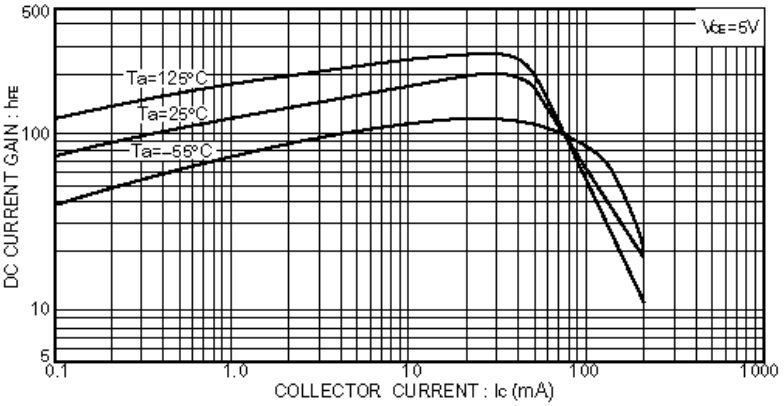


Fig.4 DC current gain vs. collector current (II)

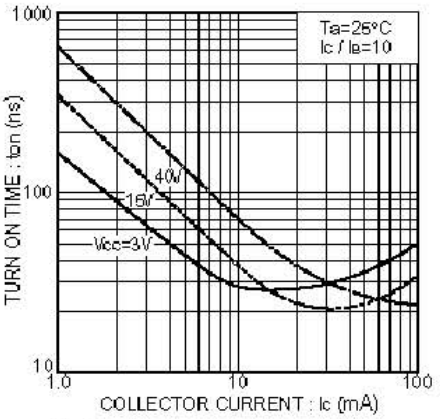


Fig.5 Turn-on time vs. collector current

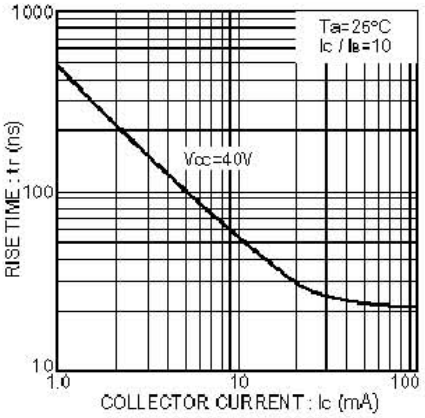


Fig.6 Rise time vs. collector current

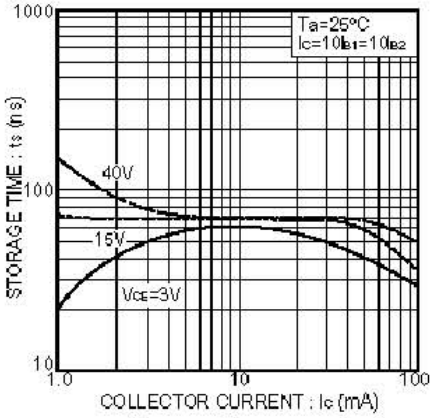


Fig.7 Storage time vs. collector current

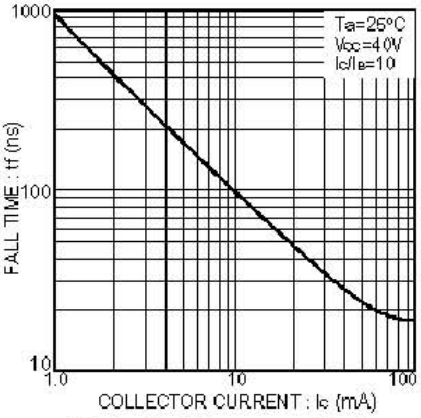


Fig.8 Fall time vs. collector current

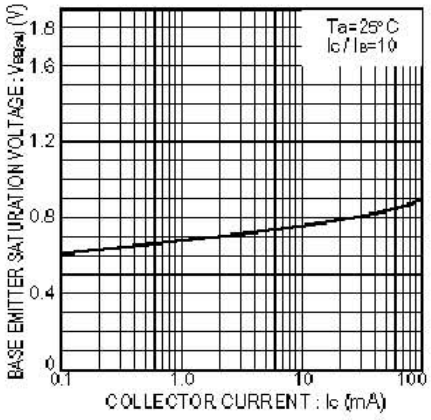


Fig.9 Base-emitter saturation voltage vs. collector current

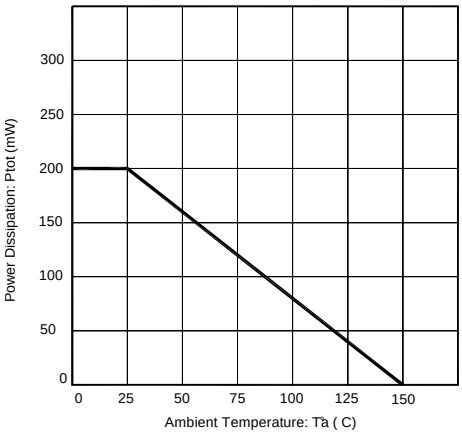
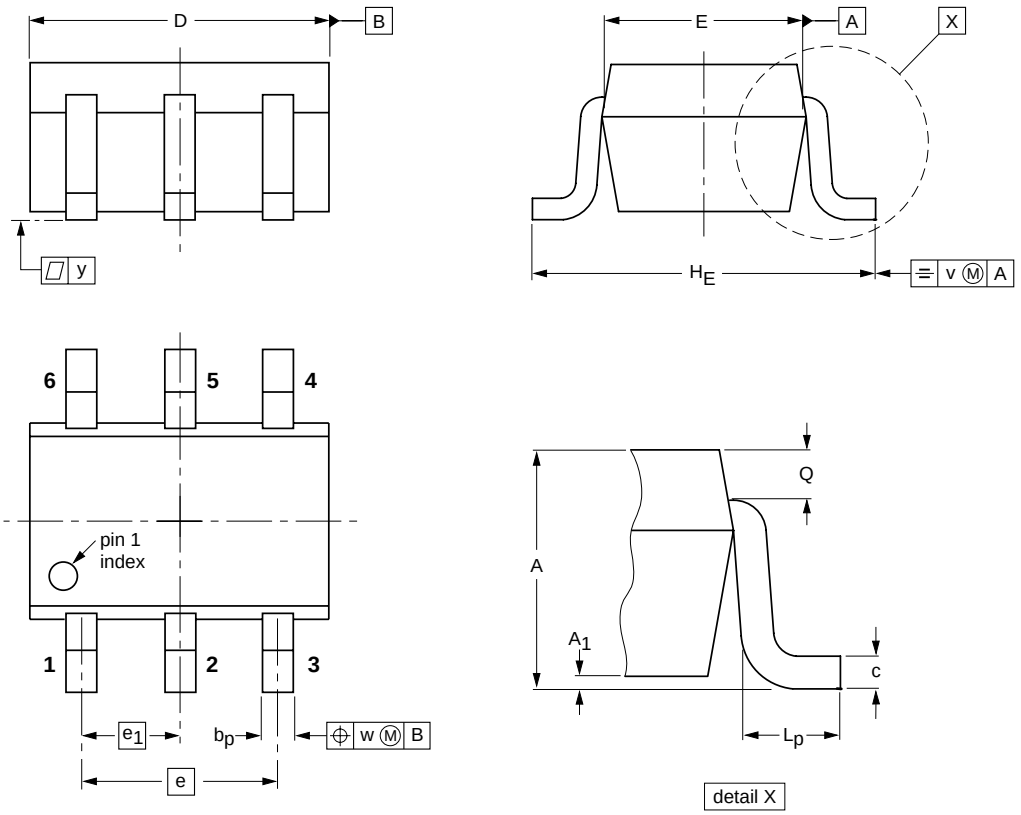


Fig.10 Power Dissipation vs Ambient Temperature

Package Outline SOT-363



DIMENSIONS (mm are the original dimensions)

UNIT	A	A_1 max	b_p	c	D	E	e	e_1	H_E	L_p	Q	v	w	y
mm	1.1 0.8	0.1	0.30 0.20	0.25 0.10	2.2 1.8	1.35 1.15	1.3	0.65	2.2 2.0	0.45 0.15	0.25 0.15	0.2	0.2	0.1

Summary of Packing Options

Package	Package Description	Packing Quantity	Industry Standard
SOT-363	Tape/Reel,7"reel	3000	EIA-481-1

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