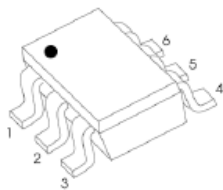
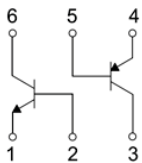


### FEATURES

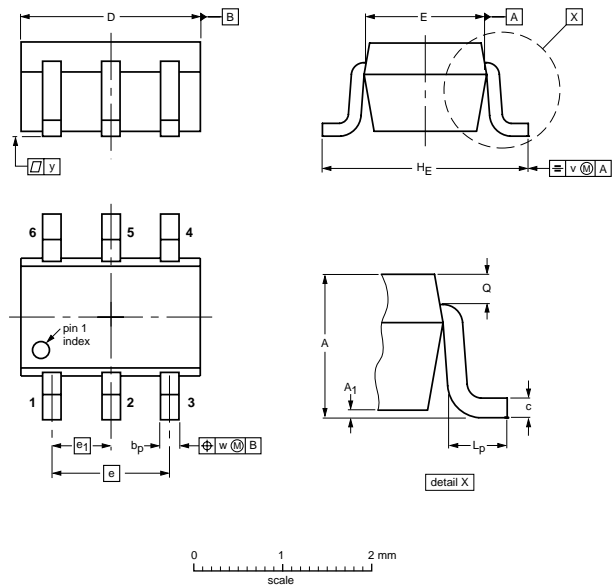
- Complementary Pair
- One 3904-Type NPN
- One 3906-Type PNP
- Epitaxial Planar Die Construction
- Ideal for Low Power Amplification and Switching

### MARKING: K 46



**SOT-363**

### SOT-363



DIMENSIONS (mm are the original dimensions)

UNIT	A	A <sub>1</sub> max	b <sub>p</sub>	c	D	E	e	e <sub>1</sub>	H <sub>E</sub>	L <sub>p</sub>	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

### MAXIMUM RATINGS (T<sub>a</sub>=25°C unless otherwise noted)

Symbol	Parameter	Value	Units
V <sub>CBO</sub>	Collector-Base Voltage	60	V
V <sub>CEO</sub>	Collector-Emitter Voltage	40	V
V <sub>EBO</sub>	Emitter-Base Voltage	5	V
I <sub>C</sub>	Collector Current -Continuous	0.2	A
P <sub>C</sub>	Collector Power Dissipation	0.2	W
T <sub>J</sub>	Junction Temperature	150	°C
T <sub>stg</sub>	Storage Temperature	-55-150	°C

# MMDT3946DW

## NPN 3904 ELECTRICAL CHARACTERISTICS (Ta=25°C unless otherwise specified)

Parameter	Symbol	Test conditions	Min	Max	Unit
Collector-base breakdown voltage	$V_{(BR)CBO}$	$I_C = 10\mu A, I_E = 0$	60		V
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	$I_C = 1mA, I_B = 0$	40		V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	$I_E = 10\mu A, I_C = 0$	5		V
Collector cut-off current	$I_{CBO}$	$V_{CB} = 30V, I_E = 0$		0.05	$\mu A$
Collector cut-off current	$I_{CEO}$	$V_{CE} = 30V, I_B = 0$		0.5	$\mu A$
Emitter cut-off current	$I_{EBO}$	$V_{EB} = 5V, I_C = 0$		0.05	$\mu A$
DC current gain	$h_{FE(1)}$	$V_{CE} = 1V, I_C = 1mA$	70	300	
	$h_{FE(2)}$	$V_{CE} = 1V, I_C = 10mA$	100		
	$h_{FE(3)}$	$V_{CE} = 1V, I_C = 50mA$	60		
	$h_{FE(4)}$	$V_{CE} = 1V, I_C = 100mA$	30		
Collector-emitter saturation voltage	$V_{CE(sat)1}$	$I_C = 10mA, I_B = 1mA$		0.2	V
	$V_{CE(sat)2}$	$I_C = 50mA, I_B = 5mA$		0.3	V
Base-emitter saturation voltage	$V_{BE(sat)1}$	$I_C = 10mA, I_B = 1mA$	0.65	0.85	V
	$V_{BE(sat)2}$	$I_C = 50mA, I_B = 5mA$		0.95	V
Transition frequency	$f_T$	$V_{CE} = 20V, I_C = 20mA, f = 100MHz$	300		MHz
Noise figure	NF	$V_{CE} = 5V, I_C = 0.1mA, f = 1KHz, R_g = 1K\Omega$		5	dB
Output capacitance	$C_{ob}$	$V_{CB} = 5V, I_E = 0, f = 1MHz$		4	pF
Delay time	$t_d$	$V_{CC} = 3V, V_{BE} = 0.5V$		35	nS
Rise time	$t_r$	$I_C = 10mA, I_{B1} = -I_{B2} = 1mA$		35	nS
Storage time	$t_s$	$V_{CC} = 3V, I_C = 10mA$		200	nS
Fall time	$t_f$	$I_{B1} = -I_{B2} = 1mA$		50	nS

# MMDT3946DW

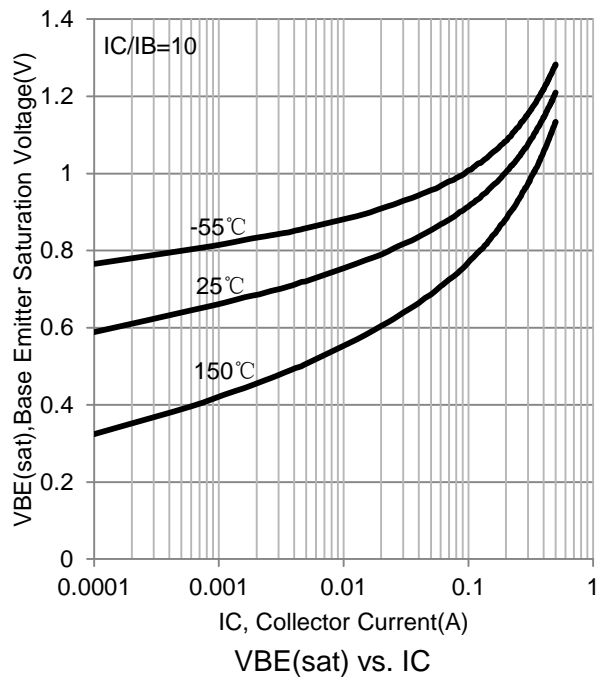
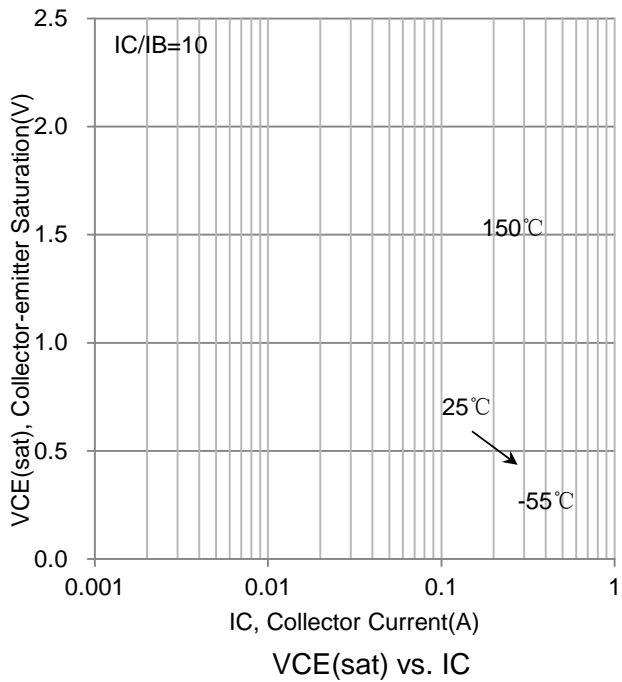
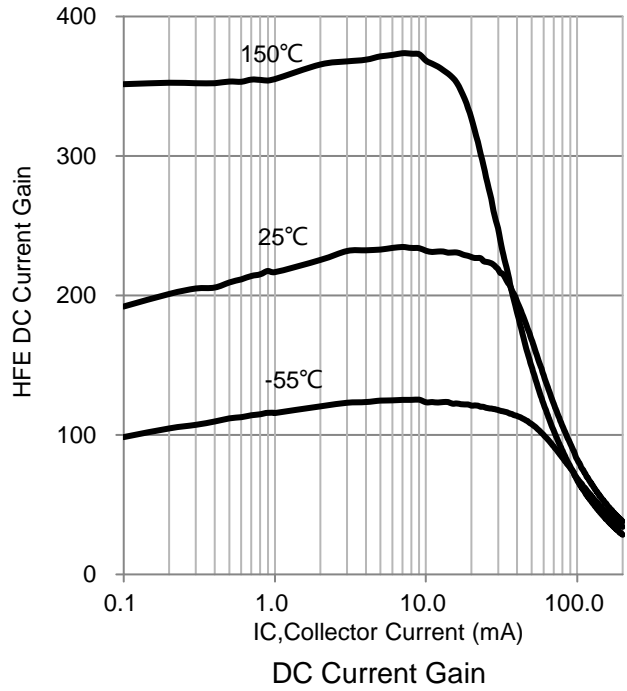
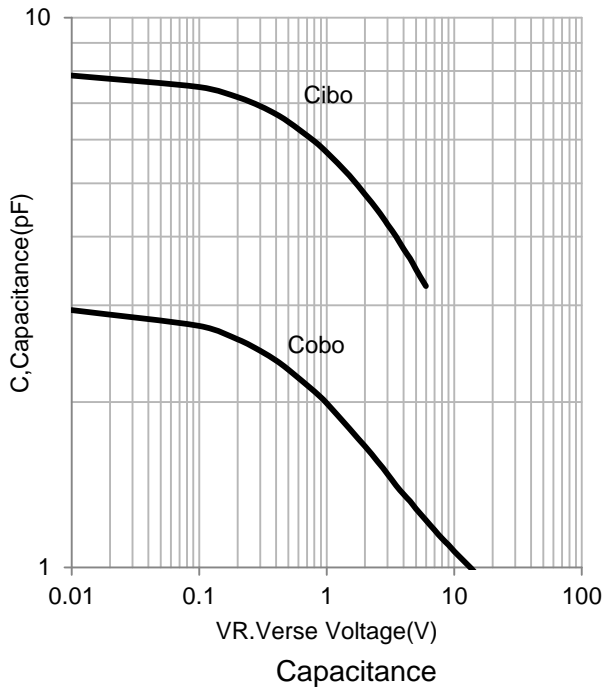
## MAXIMUM RATINGS( $T_a=25^{\circ}\text{C}$ unless otherwise noted)

Symbol	Parameter	Value	Units
$V_{CBO}$	Collector-Base Voltage	-40	V
$V_{CEO}$	Collector-Emitter Voltage	-40	V
$V_{EBO}$	Emitter-Base Voltage	-5	V
$I_C$	Collector Current -Continuous	-0.2	A
$P_C$	Collector Power Dissipation	0.2	W
$T_J$	Junction Temperature	150	$^{\circ}\text{C}$
$T_{stg}$	Storage Temperature	-55-150	$^{\circ}\text{C}$

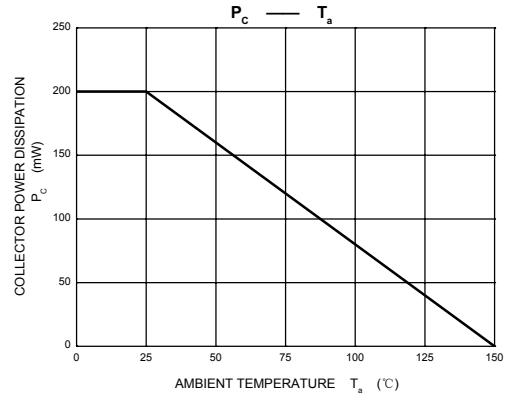
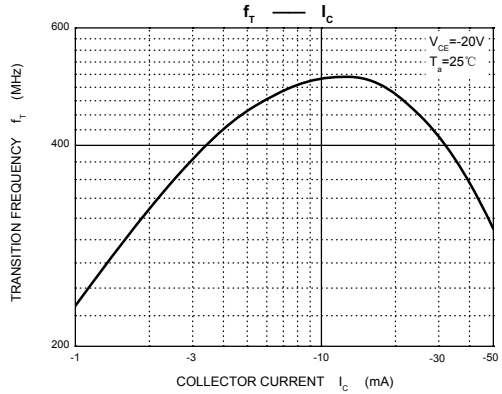
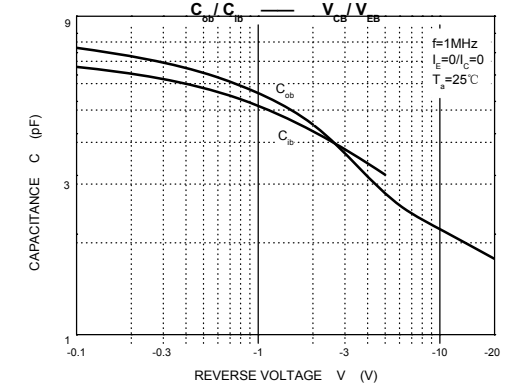
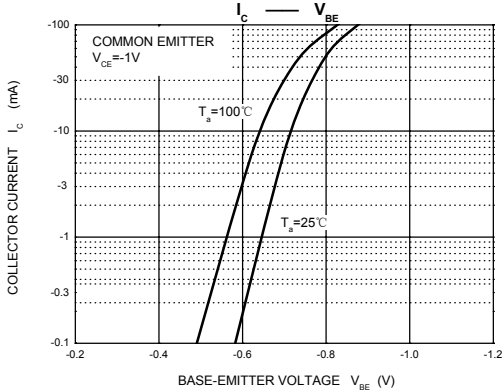
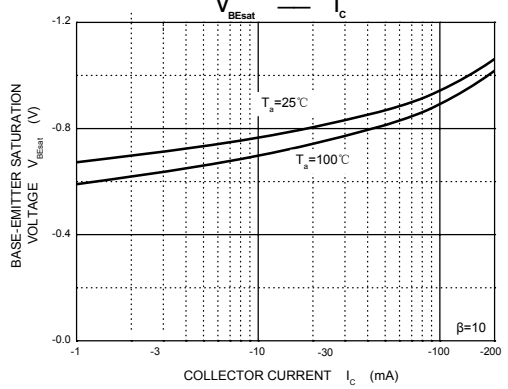
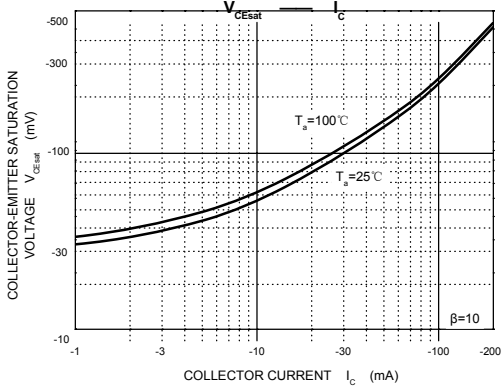
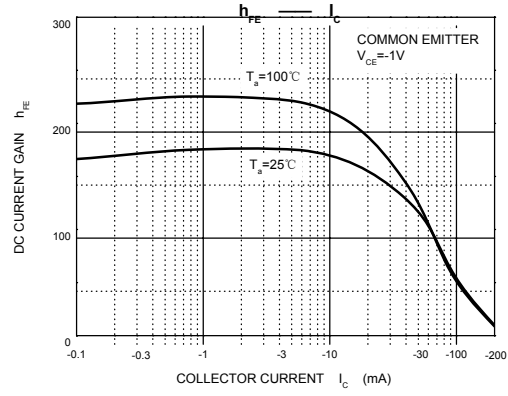
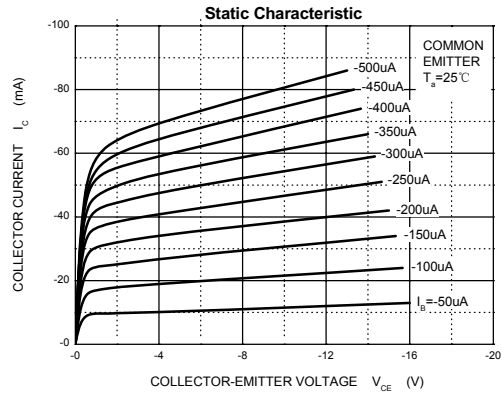
## PNP 3906 ELECTRICAL CHARACTERISTICS ( $T_a=25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Collector-base breakdown voltage	$V_{(BR)CBO}$	$I_C=-10\mu\text{A}, I_E=0$	-40			V
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	$I_C=-1\text{mA}, I_B=0$	-40			V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	$I_E=-10\mu\text{A}, I_C=0$	-5			V
Collector cut-off current	$I_{CBO}$	$V_{CB}=-30\text{V}, I_E=0$			-0.05	$\mu\text{A}$
Emitter cut-off current	$I_{EBO}$	$V_{EB}=-5\text{V}, I_C=0$			-0.05	$\mu\text{A}$
DC current gain	$h_{FE(1)}$	$V_{CE}=-1\text{V}, I_C=-1\text{mA}$	80			
	$h_{FE(2)}$	$V_{CE}=-1\text{V}, I_C=-10\text{mA}$	100		300	
	$h_{FE(3)}$	$V_{CE}=-1\text{V}, I_C=-50\text{mA}$	60			
	$h_{FE(4)}$	$V_{CE}=-1\text{V}, I_C=-100\text{mA}$	30			
Collector-emitter saturation voltage	$V_{CE(sat)1}$	$I_C=-10\text{mA}, I_B=-1\text{mA}$			-0.25	V
	$V_{CE(sat)2}$	$I_C=-50\text{mA}, I_B=-5\text{mA}$			-0.4	V
Base-emitter saturation voltage	$V_{BE(sat)1}$	$I_C=-10\text{mA}, I_B=-1\text{mA}$	-0.65		-0.85	V
	$V_{BE(sat)2}$	$I_C=-50\text{mA}, I_B=-5\text{mA}$			-0.95	V
Transition frequency	$f_T$	$V_{CE}=-20\text{V}, I_C=-10\text{mA}, f=100\text{MHz}$	250			MHz
Collector output capacitance	$C_{ob}$	$V_{CB}=-5\text{V}, I_E=0, f=1\text{MHz}$			4.5	pF
Noise figure	NF	$V_{CE}=-5\text{V}, I_C=-0.1\text{mA}, f=1\text{KHz}, R_g=1\text{K}\Omega$			4	dB
Delay time	$t_d$	$V_{CC}=-3\text{V}, V_{BE}=-0.5\text{V}$			35	nS
Rise time	$t_r$	$I_C=-10\text{mA}, I_{B1}=-I_{B2}=-1\text{mA}$			35	nS
Storage time	$t_s$	$V_{CC}=-3\text{V}, I_C=-10\text{mA}$			225	nS
Fall time	$t_f$	$I_{B1}=-I_{B2}=-1\text{mA}$			75	nS

# MMBT3904 Typical Characteristics



# MMBT3906 Typical Characteristics



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