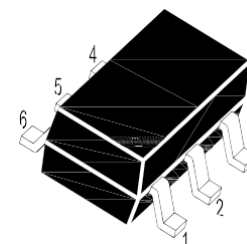


MMBT3946DW Transistor(NPN/PNP)
Q1 MAXIMUM RATINGS ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

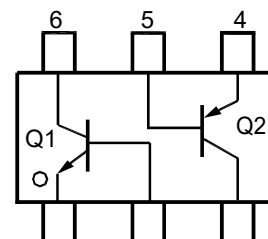
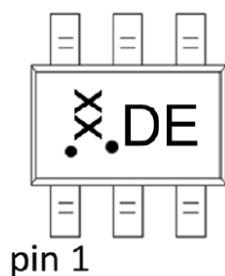
Parameter	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	60	V
Collector-Emitter Voltage	V_{CEO}	40	V
Emitter-Base Voltage	V_{EBO}	6	V
Collector Current -Continuous	I_C	0.2	A
Power Dissipation	P_d	0.2	W
Junction Temperature	T_J	150	$^{\circ}\text{C}$
Storage Temperature	T_{STG}	-55~ +150	$^{\circ}\text{C}$

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

Q2 MAXIMUM RATINGS ($T_A=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Collector-Base Voltage	V_{CBO}	-40	V
Collector-Emitter Voltage	V_{CEO}	-40	V
Emitter-Base Voltage	V_{EBO}	-6	V
Collector Current -Continuous	I_C	-0.2	A
Power Dissipation	P_d	0.2	W
Junction Temperature	T_J	150	$^{\circ}\text{C}$
Storage Temperature	T_{STG}	-55~ +150	$^{\circ}\text{C}$


Marking:


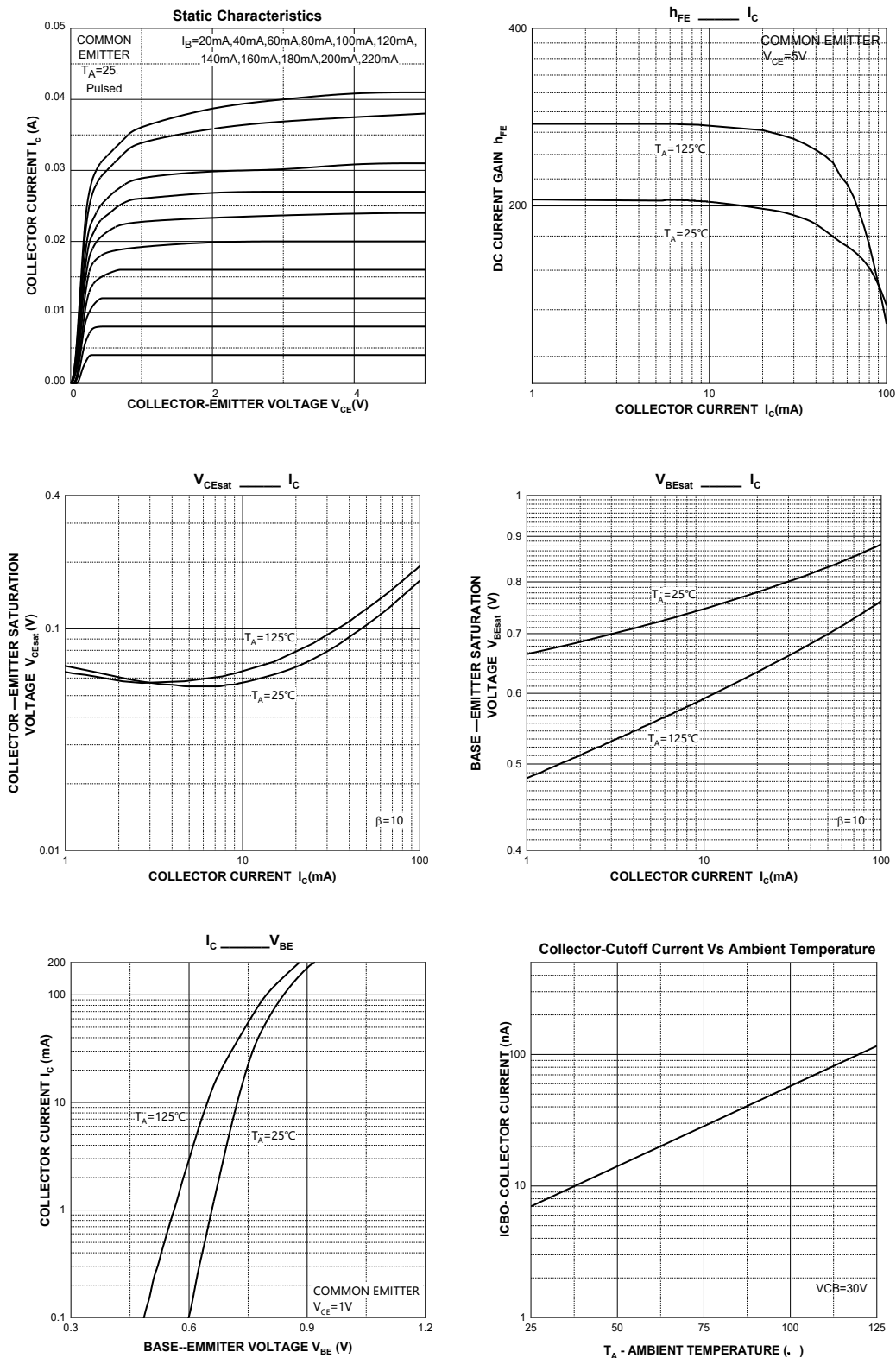
Q1 ELECTRICAL CHARACTERISTICS(T_A=25°C unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Max	Unit
Collector-Base Breakdown Voltage	V _{(BR)CBO}	I _C = 10μA, 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 = 10μA, I _C = 0	6		V
Collector Cut-Off Current	I _{CBO}	V _{CB} = 30V, I _E = 0		50	nA
Emitter Cut-Off Current	I _{EBO}	V _{EB} = 6V, I _C = 0		50	nA
DC Current Gain	h _{FE1}	V _{CE} = 1V, I _C = 0.1mA	40		
	h _{FE2}	V _{CE} = 1V, I _C = 1mA	70		
	h _{FE3}	V _{CE} = 1V, I _C = 10mA	100	300	
	h _{FE4}	V _{CE} = 1V, I _C = 50mA	60		
	h _{FE5}	V _{CE} = 1V, I _C = 100mA	30		
Collector-Emitter Saturation Voltage	V _{CE(sat)}	I _C = 10mA, I _B = 1mA		0.2	V
		I _C = 50mA, I _B = 5mA		0.3	V
Base-Emitter Saturation Voltage	V _{BE(sat)}	I _C = 10mA, I _B = 1mA	0.65	0.85	V
		I _C = 50mA, I _B = 5mA		0.95	V
Transition Frequency	f _T	V _{CE} = 20V, I _C = 10mA, f = 100MHz	300		MHZ
Collector Output Capacitance	C _{pd}	V _{CB} = 5V, I _E = 0mA, f = 1MHz		4	pF
Delay Time	t _d	V _{CC} = 3V, I _C = 10mA,		35	ns
Rise Time	t _r	V _{BE(off)} = -0.5V, I _{B1} = 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

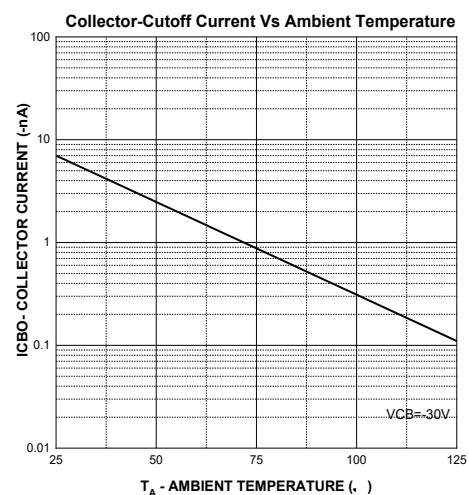
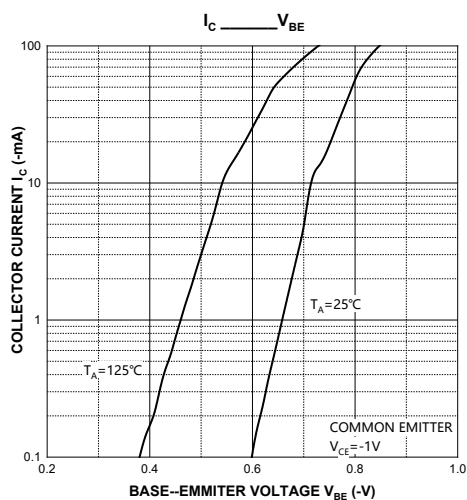
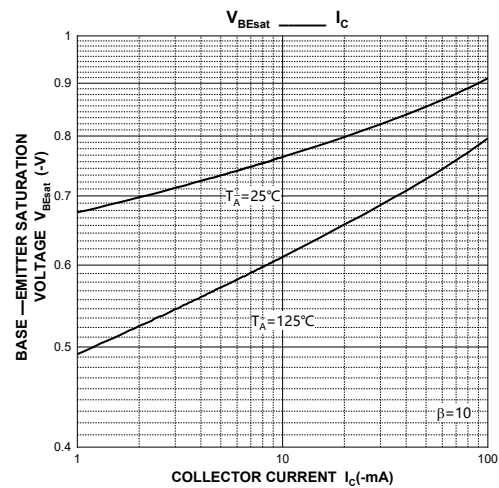
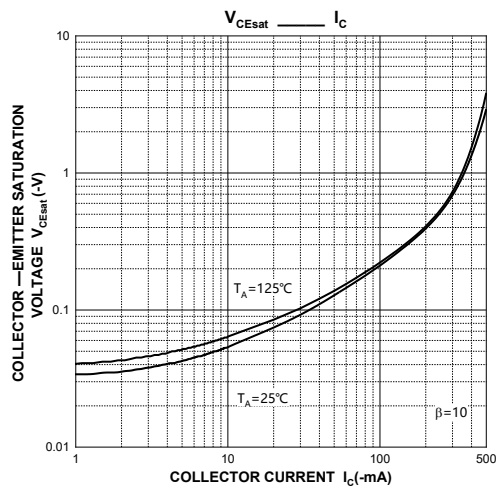
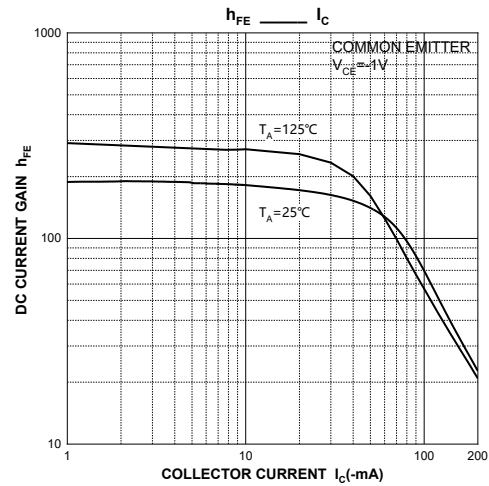
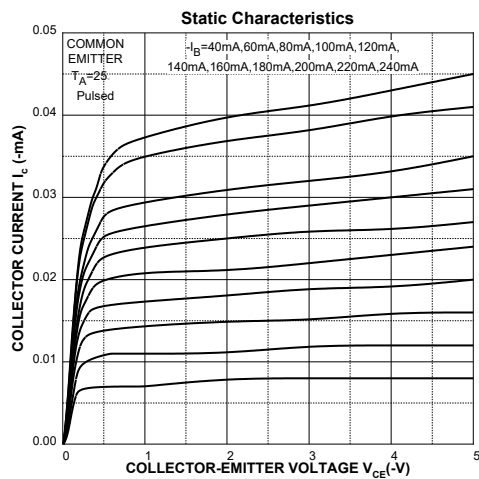
Q2 ELECTRICAL CHARACTERISTICS(T_A=25°C unless otherwise noted)

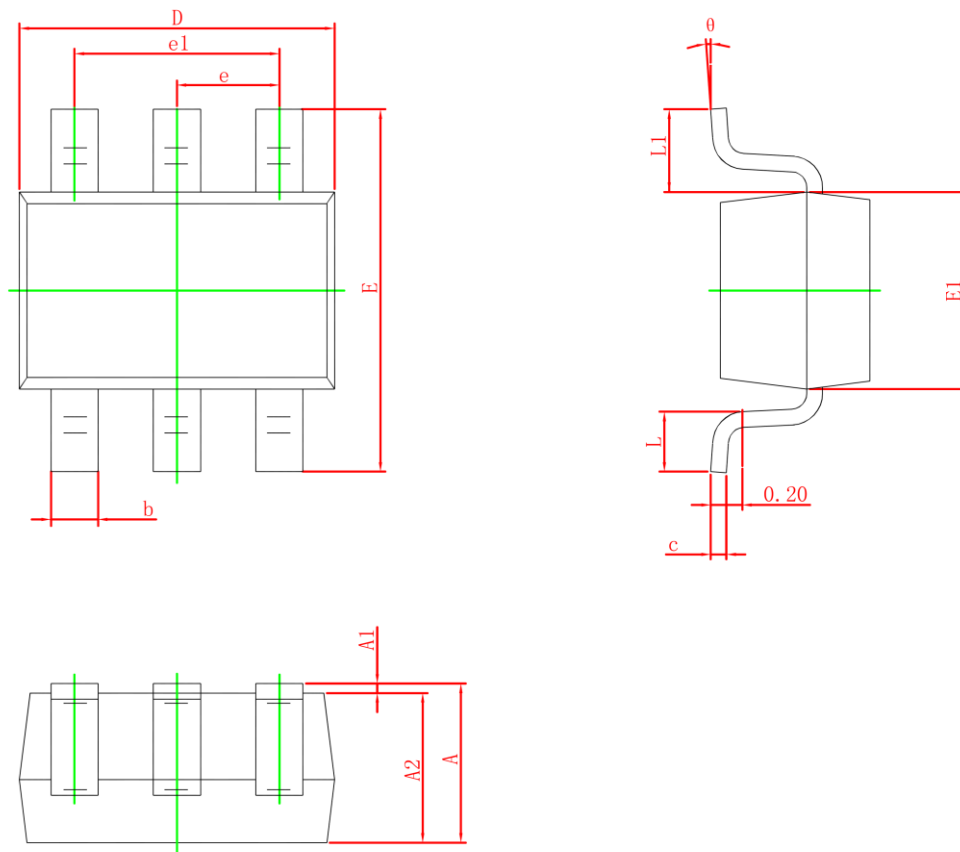
Parameter	Symbol	Test Condition	Min	Max	Unit
Collector-Base Breakdown Voltage	V _{(BR)CBO}	I _C = -10μA, I _E = 0	-40		V
Collector-Emitter Breakdown Voltage	V _{(BR)CEO}	I _C = -1mA, I _B = 0	-40		V
Emitter-Base Breakdown Voltage	V _{(BR)EBO}	I _E = -10μA, I _C = 0	-6		V
Collector Cut-Off Current	I _{CBO}	V _{CB} = -30V, I _E = 0		-50	nA
Emitter Cut-Off Current	I _{EBO}	V _{EB} = -6V, I _C = 0		-50	nA
DC Current Gain	h _{FE1}	V _{CE} = -1V, I _C = -0.1mA	60		
	h _{FE2}	V _{CE} = -1V, I _C = -1mA	80		
	h _{FE3}	V _{CE} = -1V, I _C = -10mA	100	300	
	h _{FE4}	V _{CE} = -1V, I _C = -50mA	60		
	h _{FE5}	V _{CE} = -1V, I _C = -100mA	30		
Collector-Emitter Saturation Voltage	V _{CE(sat)}	I _C = -10mA, I _B = -1mA		-0.25	V
		I _C = -50mA, I _B = -5mA		-0.4	V
Base-Emitter Saturation Voltage	V _{BE(sat)}	I _C = -10mA, I _B = -1mA	-0.65	-0.85	V
		I _C = -50mA, I _B = -5mA		-0.95	V
Transition Frequency	f _T	V _{CE} = -20V, I _C = -10mA, f = 100MHz	250		MHZ
Output Capacitance	C _{obo}	V _{CB} = -5.0V, f = 1.0MHz, I _E = 0		4.5	pf
Delay Time	t _d	V _{CC} = -3.0V, I _C = -10mA,		35	ns
Rise Time	t _r	V _{BE(off)} = 0.5V, I _{B1} = -1.0mA		35	ns
Storage Time	t _s	V _{CC} = -3.0V, I _C = -10mA,		225	ns
Fall Time	t _f	I _{B1} = I _{B2} = -1.0mA		75	ns

Typical Characteristics (Q1)



Typical Characteristics (Q2)



SOT-363 Package Information


Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.900	1.000	0.035	0.039
A1	0	0.100	0.000	0.004
A2	0.900	1.000	0.035	0.039
b	0.150	0.350	0.006	0.014
c	0.080	0.150	0.003	0.006
D	1.800	2.200	0.071	0.087
E	2.000	2.450	0.079	0.096
E1	1.150	1.350	0.045	0.053
e	0.650TYP		0.026TYP	
e1	1.200	1.400	0.047	0.055
L1	0.525REF		0.021REF	
L	0.260	0.460	0.010	0.018
θ	0°	8°	0°	8°

Attention:

- GreenPower Electronics reserves the right to improve product design function and reliability without notice.
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