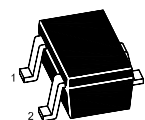
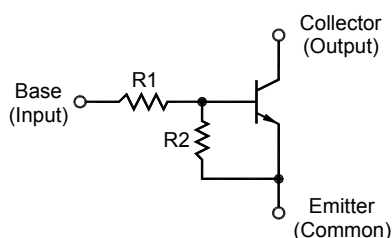


MMDT5210W...MMDT521ZW

NPN Silicon Epitaxial Planar Digital Transistor



1.Base 2.Emitter 3.Collector
SOT-323 Plastic Package

Resistance Values

Type	R1 (KΩ)	R2 (KΩ)	Type	R1 (KΩ)	R2 (KΩ)
MMDT5210W	47	-	MMDT521DW	47	10
MMDT5211W	10	10	MMDT521EW	47	22
MMDT5212W	22	22	MMDT521FW	4.7	10
MMDT5213W	47	47	MMDT521KW	10	4.7
MMDT5214W	10	47	MMDT521LW	4.7	4.7
MMDT5215W	10	-	MMDT521MW	2.2	47
MMDT5216W	4.7	-	MMDT521NW	4.7	47
MMDT5217W	22	-	MMDT521TW	22	47
MMDT5218W	0.51	5.1	MMDT521VW	2.2	2.2
MMDT5219W	1	10	MMDT521ZW	4.7	22

Absolute Maximum Ratings ($T_a = 25\text{ }^\circ\text{C}$)

Parameter	Symbol	Value	Unit
Collector Base Voltage	V_{CBO}	50	V
Collector Emitter Voltage	V_{CEO}	50	V
Collector Current	I_C	100	mA
Total Power Dissipation	P_{tot}	200	mW
Junction Temperature	T_j	150	$^\circ\text{C}$
Storage Temperature Range	T_{stg}	- 55 to + 150	$^\circ\text{C}$

MMDT5210W...MMDT521ZW

Characteristics at $T_a = 25\text{ }^\circ\text{C}$

Parameter	Symbol	Min.	Typ.	Max.	Unit
DC Current Gain at $V_{CE} = 5\text{ V}$, $I_C = 10\text{ mA}$	MMDT5218/521K/521L/521VW MMDT5219/521D/521FW MMDT5211W MMDT5212/521EW MMDT521ZW MMDT5213/5214/521MW MMDT521N/521TW MMDT5210/5215/5216/5217W ¹⁾	20 30 35 60 60 80 80 160	- - - - - - - -	- - - - 200 - 400 460	- - - - - - - -
Collector Base Cutoff Current at $V_{CB} = 50\text{ V}$	I_{CBO}	-	-	100	nA
Emitter Base Cutoff Current at $V_{EB} = 6\text{ V}$	MMDT5210/5215/5216/5217W MMDT5213W MMDT5212/5214/521D/521E/521M/521N/521TW MMDT521ZW MMDT5211W MMDT521F/521KW MMDT5219W MMDT5218/521L/521VW	- - - - - - - -	- - - - - - - -	0.01 0.1 0.2 0.4 0.5 1 1.5 2	mA
Collector Base Breakdown Voltage at $I_C = 10\text{ }\mu\text{A}$	$V_{(BR)CBO}$	50	-	-	V
Collector Emitter Breakdown Voltage at $I_C = 2\text{ mA}$	$V_{(BR)CEO}$	50	-	-	V
Collector Emitter Saturation Voltage at $I_C = 10\text{ mA}$, $I_B = 0.5\text{ mA}$	V_{CEsat}	-	-	0.3	V
Transition Frequency at $V_{CB} = 10\text{ V}$, $-I_E = 5\text{ mA}$, $f = 100\text{ MHz}$	f_T	-	250	-	MHz
Input Voltage (ON) at $V_O = 0.3\text{ V}$, $I_O = 20\text{ mA}$ at $V_O = 0.3\text{ V}$, $I_O = 20\text{ mA}$ at $V_O = 0.3\text{ V}$, $I_O = 2\text{ mA}$ at $V_O = 0.3\text{ V}$, $I_O = 2\text{ mA}$ at $V_O = 0.3\text{ V}$, $I_O = 2\text{ mA}$ at $V_O = 0.3\text{ V}$, $I_O = 10\text{ mA}$ at $V_O = 0.2\text{ V}$, $I_O = 5\text{ mA}$ at $V_O = 0.3\text{ V}$, $I_O = 2\text{ mA}$ at $V_O = 0.3\text{ V}$, $I_O = 5\text{ mA}$ at $V_O = 0.2\text{ V}$, $I_O = 5\text{ mA}$ at $V_O = 0.3\text{ V}$, $I_O = 5\text{ mA}$ at $V_O = 0.3\text{ V}$, $I_O = 1\text{ mA}$	MMDT521V/521L/5219/5218W MMDT521FW MMDT521TW MMDT521DW MMDT521EW MMDT5211W MMDT5212W MMDT5213/521KW MMDT521MW MMDT521ZW MMDT521NW MMDT5214W	- - - - - - - - - - - - - -	- - - - - - - - - - - - - -	3 2.5 2.5 5 4 3 3 3 1.1 1.7 1.3 1.4	V

¹⁾ h_{FE} Rank Classification: Q: 160~260, R: 210~340, S: 290~460, No-rank: 160~460

MMDT5210W...MMDT521ZW

Characteristics at $T_a = 25\text{ }^\circ\text{C}$

Parameter	Symbol	Min.	Typ.	Max.	Unit	
Input Voltage (OFF) at $V_{CC} = 5\text{ V}$, $I_o = 100\text{ }\mu\text{A}$	MMDT521V/521L/5211/5212/5213W MMDT5218/5219/521M/521Z/521NW MMDT521F/5214W MMDT521TW MMDT521DW MMDT521K/521EW	$V_{I(OFF)}$	0.5 0.5 0.3 0.4 1 0.8	- - - - - -	- - - - - -	V
Input Resistance	MMDT5218W MMDT5219W MMDT521M/521V MMDT5216/521F/521L/521N/521ZW MMDT5211/5214/5215/521KW MMDT5212/5217/521TW MMDT5210/5213/521D/521EW	R1	- 30%	0.51 1 2.2 4.7 10 22 47	+ 30%	K Ω
Resistance Ratio	MMDT521MW MMDT521NW MMDT5218/5219W MMDT521ZW MMDT5214W MMDT521TW MMDT521FW MMDT521VW MMDT5211/5212/5213/521LW MMDT521KW MMDT521EW MMDT521DW	R1/R2	- - 0.08 - 0.17 - 0.37 - 0.8 1.7 1.7 3.7	0.047 0.1 0.1 0.21 0.21 0.47 0.47 1 1 2.13 2.14 4.7	- - 0.12 - 0.25 - 0.57 - 1.2 2.6 2.6 5.7	- - - - - - - - - - - -