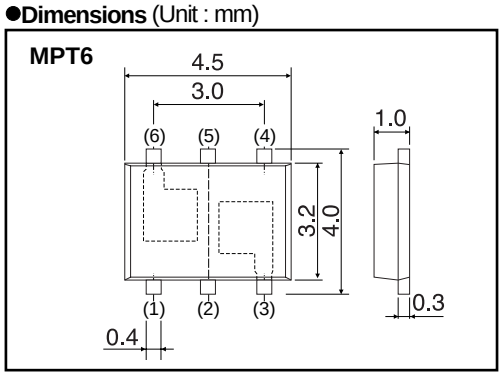
Medium Power Transistor (60V, 3A)

MP6X3

●**Application**
Low frequency amplifier
High speed switching

●**Features**
1) High speed switching. (t_f : Typ. : 30ns at I_C=3A)
2) Low saturation voltage, typically
(Typ. : 200mV at I_C=2A, I_B=200mA)
3) Strong discharge power for inductive load and capacitance load.
4) Contain two 2SC5824-dies in a package.

●**Dimensions** (Unit : mm)

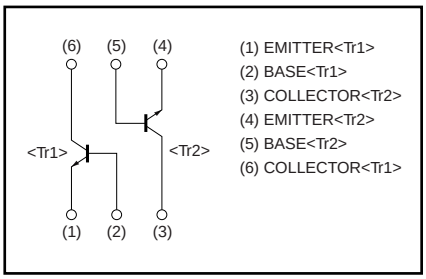


●**Structure**
NPN silicon epitaxial planar transistor

●**Packaging specifications**

Type	Package	Taping
	Code	TR
	Basic ordering unit (pieces)	1000
MP6X3		O

●**Inner circuit**



●**Absolute maximum ratings** (Ta=25°C)
<Tr1, Tr2>

Parameter		Symbol	Limits	Unit
Collector-base voltage		V_{CBO}	60	V
Collector-emitter voltage		V_{CEO}	60	V
Emitter-base voltage		V_{EBO}	6	V
Collector current	Continuous	I_C	3	A
	Pulsed	I_{CP} *1	6	A
Power dissipation		P_D *2	2.0	W / TOTAL
			1.4	W / ELEMENT
Junction temperature		Tj	150	°C
Range of storage temperature		Tstg	−55 to +150	°C

*1 Pw=10ms 1Pulse
*2 Mounted on a ceramic board

●**Electrical characteristics** (Ta=25°C)

<Tr1, Tr2>

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Collector-Emitter breakdown voltage	BV_{CEO}	60	–	–	V	I_C= 1mA
Collector-base breakdown voltage	BV_{CBO}	60	–	–	V	I_C= 100μA
Emitter-base breakdown voltage	BV_{EBO}	6	–	–	V	I_E= 100μA
Collector cut off current	I_{CBO}	–	–	1.0	μA	V_{CB}= 40V
Emitter cut off current	I_{EBO}	–	–	1.0	μA	V_{EB}= 4V
Collector-emitter saturation voltage	$V_{CE(sat)}$ *1	–	200	500	mV	I_C/I_B= 2.0A/200mA
DC current gain	h_{FE}	120	–	390	–	V_{CE}= 2V, I_C= 100mA
Transition frequency	f_T *1	–	200	–	MHz	V_{CE}= 10V, I_E= −100mA, f=10MHz
Collector output capacitance	Cob	–	20	–	pF	V_{CB}= 10V, I_E=0A, f=1MHz
Turn-on time	t_{on} *2	–	50	–	ns	I_C= 3V I_{B1}= 300mA I_{B2}= −300mA V_{CC} ≃ −25V
Storage time	t_{stg} *2	–	150	–	ns	
Fall time	t_f *2	–	30	–	ns	

*1 Pulsed
*2 See switching time test circuit

●**Electrical characteristics curves**

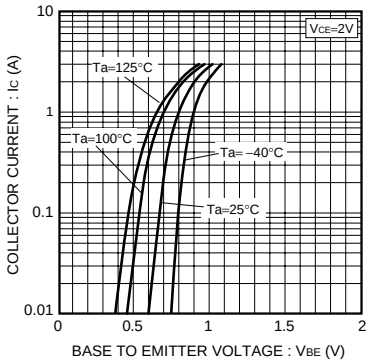


Fig.1 Ground emitter propagation characteristics

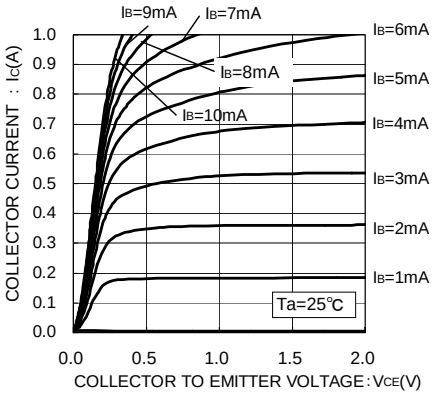


Fig.2 Grounded emitter output characteristics

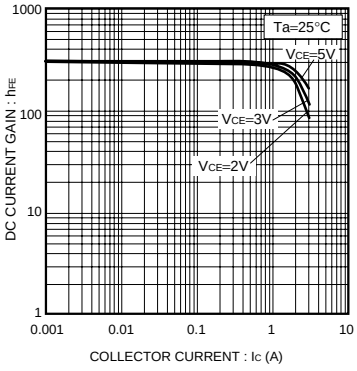


Fig.3 DC current gain vs. collector current

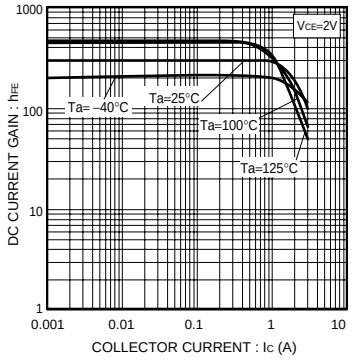


Fig.4 DC current gain vs. collector current

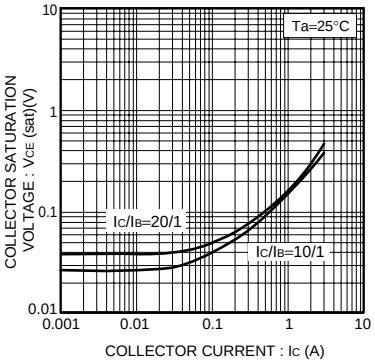


Fig.5 Collector-emitter saturation voltage vs. collector current

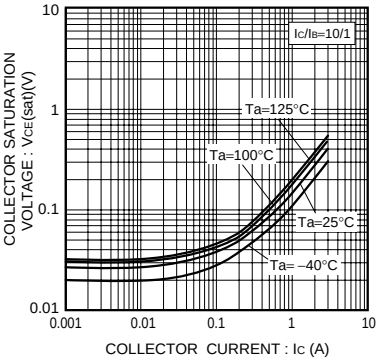


Fig.6 Collector-emitter saturation voltage vs. Collector Current

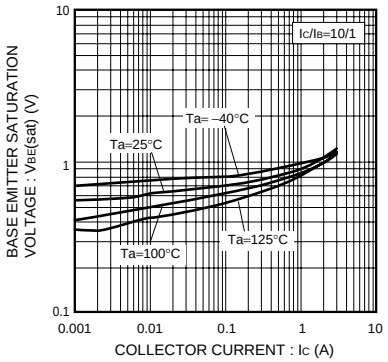


Fig.7 Base-emitter saturation voltage vs. collector current

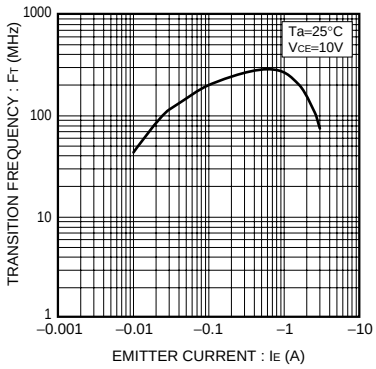


Fig.8 Transition frequency

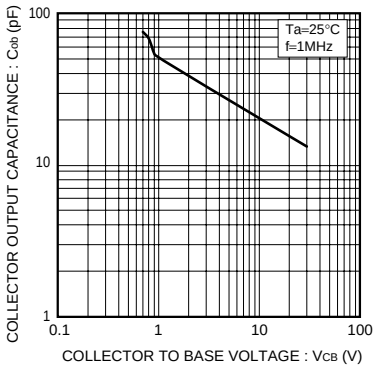


Fig.9 Collector output capacitance

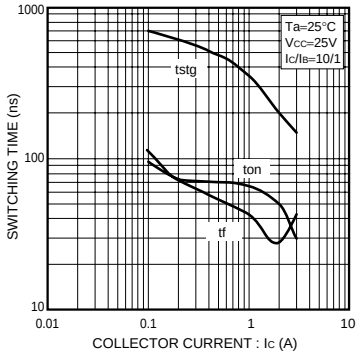


Fig.10 Switching Time

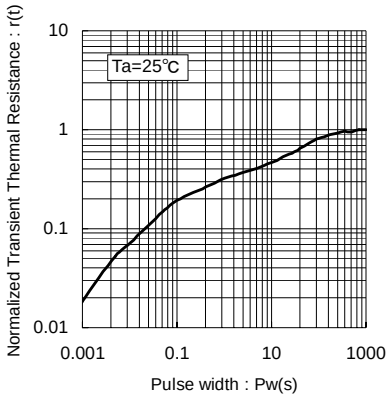


Fig.11 Normalized thermal resistance (Element)

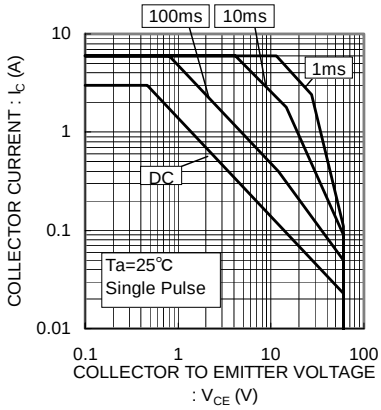
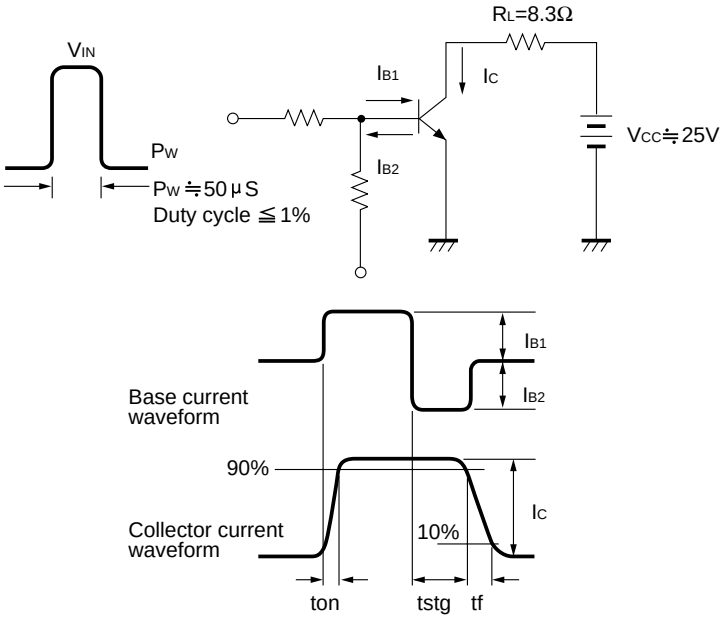


Fig.12 Safe operating area (Tr1&Tr2)

●Switching characteristics measurement circuits



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