FMMT720 TRANSISTOR (PNP)

SOT-23-3

FEATURE

- Switching transistor
- Extremely low saturation voltage
- Complementary NPN type: FMMT619

APPLICATION

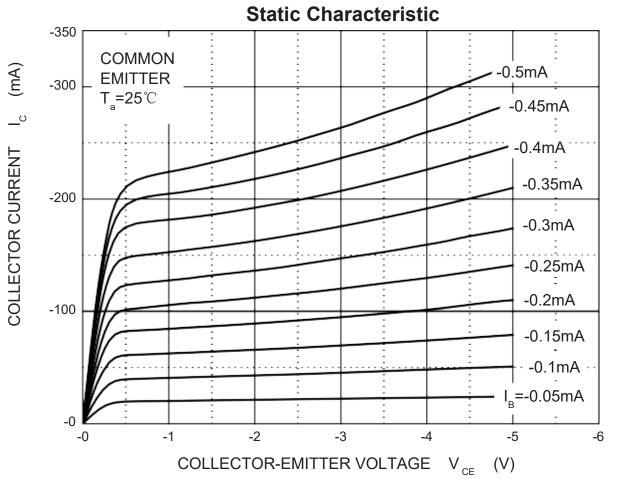
- Gate Driving MOSFETs and IGBTs
- DC-DC converters
- Charging circuit
- Power switches

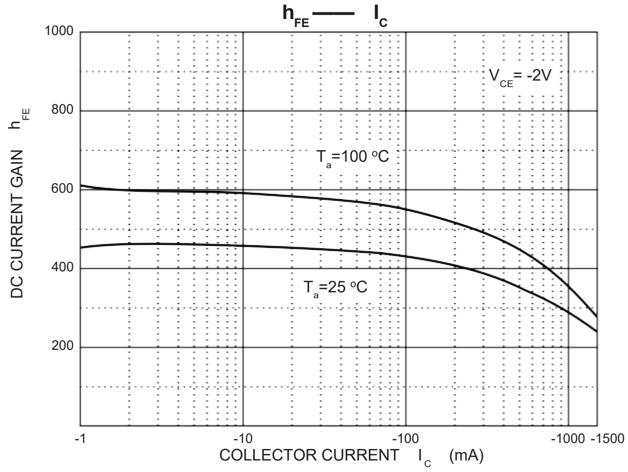
MAXIMUM RATINGS (T_a=25℃ unless otherwise noted)

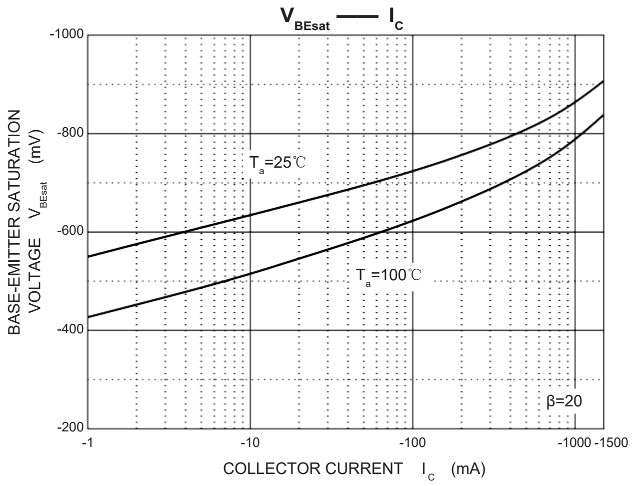
Symbol	Parameter	Value	Unit
V_{CBO}	Collector-Base Voltage	-40	V
V_{CEO}	Collector-Emitter Voltage	-40	V
V_{EBO}	Emitter-Base Voltage	-5	V
I_B	Base Current	-0.5	A
I_C*	Collector Current -Continuous	-1.5	A
I_{CM}	Peak Pulse Current	-4	A
P_C	Total Collector Dissipation	350	mW
$R_{\Theta JA}$	Thermal Resistance from Junction to Ambient	357	℃/W
T_J,T_{stg}	Operation Junction and Storage Temperature Range	-55~+150	℃

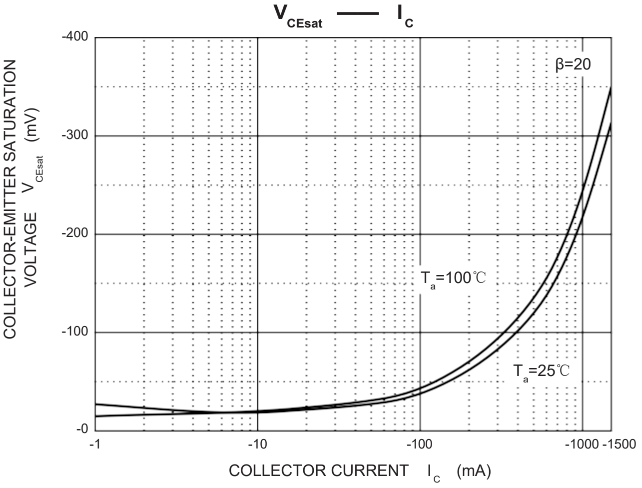
Parameter	Symbol	Test conditions	Min	Typ	Max	Unit
Collector-base breakdown voltage	$V_{(BR)CBO}$	I_C=-100µA, I_E=0	-40			V
Collector-emitter breakdown voltage	$V_{(BR)CEO}$*	I_C= -10mA, I_B=0	-40			V
Emitter-base breakdown voltage	$V_{(BR)EBO}$	I_E= -100µA, I_C=0	-5			V
Collector cut-off current	I_{CBO}	V_{CB}=-35V, I_E=0			-0.1	µA
Collector cut-off current	I_{CES}	V_{CE}=-35V,V_{BE}=0			-0.1	µA
Emitter cut-off current	I_{EBO}	V_{EB}= -4V, I_C=0			-0.1	µA
DC current gain	$h_{FE(1)}$ *	V_{CE}= -2V, I_C=-10mA	300			
	$h_{FE(2)}$ *	V_{CE}=-2V, I_C=-100mA	300			
	$h_{FE(3)}$ *	V_{CE}=-2V, I_C=-1A	180			
	$h_{FE(4)}$ *	V_{CE}=-2V, I_C=-1.5A	60			
	$h_{FE(5)}$ *	V_{CE}=-2V, I_C=-3A	12			
Collector-emitter saturation voltage	$V_{CE(sat)\ (1)}$ *	I_C=-0.1A, I_B=-10mA			-40	mV
	$V_{CE(sat)\ (2)}$ *	I_C=-1A, I_B=-50mA			-220	mV
	$V_{CE(sat)\ (3)}$ *	I_C=-1.5A, I_B=-100mA			-330	mV
Base-emitter saturation voltage	$V_{BE(sat)}$ *	I_C=-1.5A, I_B= -75mA			-1	V
Base-emitter voltage	$V_{BE(on)}$ *	V_{CE}=-2V, I_C=-1.5A			-1	V
Transition frequency	f_T	V_{CE}=-10V,I_C=-50mA, f=100MHz	150			MHz
Collector output capacitance	C_{ob}	V_{CB}=-10V,f=1MHz			25	pF
Turn-on Time	$t_{(on)}$	V_{CC}=-15V, I_C=-0.75A, I_{B1}= I_{B2}=-15mA		40		ns
Turn-off Time	$t_{(off)}$			435		ns

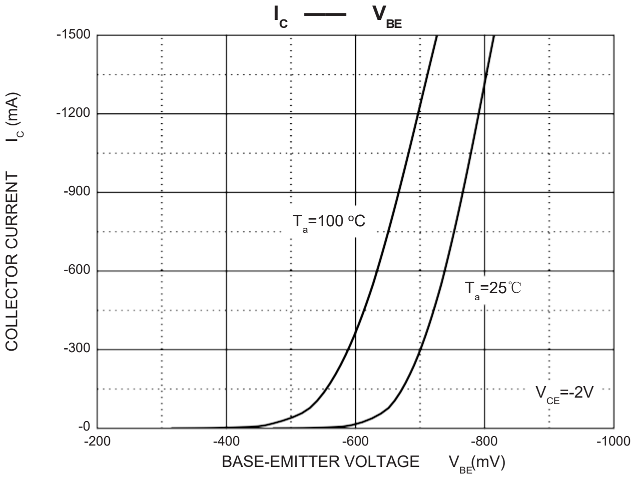
*Measured under pulse conditions . Pulse width =300µs. Duty cycle≤2%.

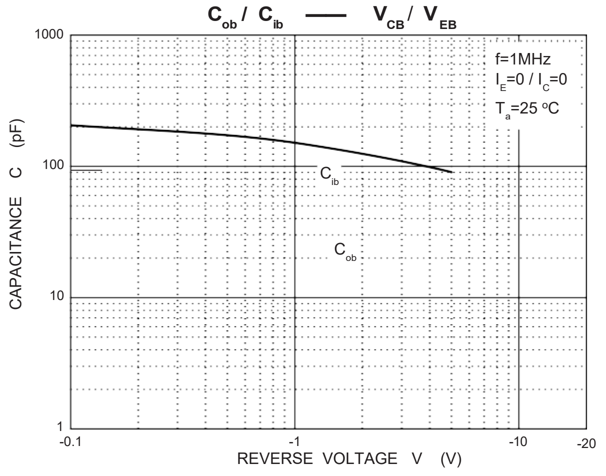

Static Characteristic
COMMON
EMITTER
T_a=25℃
-0.5mA
-0.45mA
-0.4mA
-0.35mA
-0.3mA
-0.25mA
-0.2mA
-0.15mA
-0.1mA
I_B=-0.05mA
COLLECTOR CURRENT I_C (mA)
-350
-300
-200
-100
-0
-1
-2
-3
-4
-5
-6
COLLECTOR-EMITTER VOLTAGE V_{CE} (V)

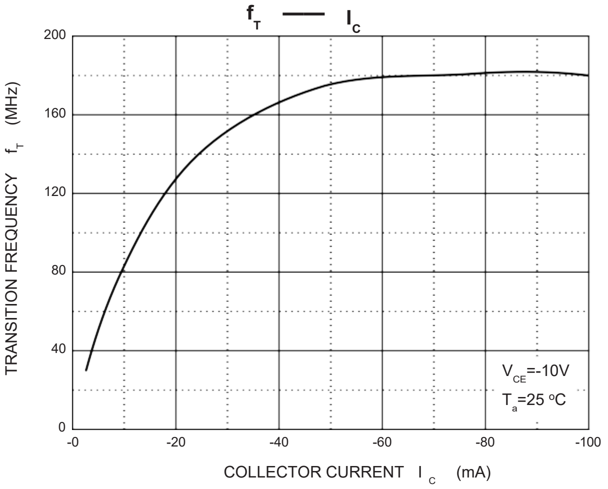

h_{FE} —— I_C
V_{CE}= -2V
T_a=100 °C
T_a=25 °C
DC CURRENT GAIN h_{FE}
1000
800
600
400
200
-1
-10
-100
-1000 -1500
COLLECTOR CURRENT I_C (mA)

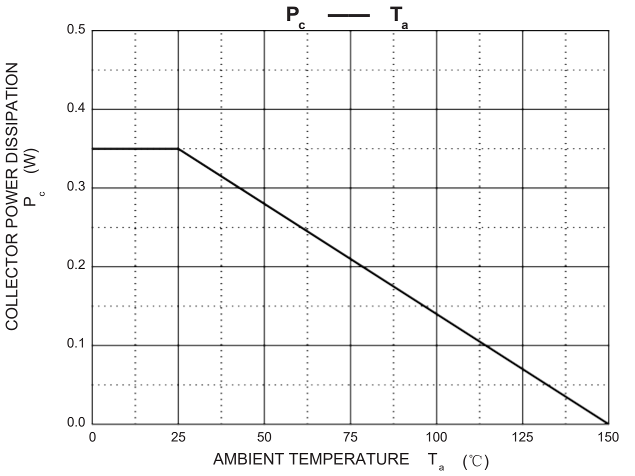

V_{BEsat} —— I_C
T_a=25℃
T_a=100℃
β=20
BASE-EMITTER SATURATION VOLTAGE V_{BEsat} (mV)
-1000
-800
-600
-400
-200
-1
-10
-100
-1000 -1500
COLLECTOR CURRENT I_C (mA)


V_{CEsat} —— I_C
β=20
T_a=100℃
T_a=25℃
COLLECTOR-EMITTER SATURATION VOLTAGE V_{CEsat} (mV)
-400
-300
-200
-100
-0
-1
-10
-100
-1000 -1500
COLLECTOR CURRENT I_C (mA)


I_C —— V_{BE}
T_a=100 °C
T_a=25℃
V_{CE}=-2V
COLLECTOR CURRENT I_C (mA)
-1500
-1200
-900
-600
-300
-0
-200
-400
-600
-800
-1000
BASE-EMITTER VOLTAGE V_{BE}(mV)


C_{ob} / C_{ib} —— V_{CB} / V_{EB}
f=1MHz
I_E=0 / I_C=0
T_a=25 °C
C_{ib}
C_{ob}
CAPACITANCE C (pF)
1000
100
10
1
-0.1
-1
-10
-20
REVERSE VOLTAGE V (V)


f_T —— I_C
V_{CE}=-10V
T_a=25 °C
TRANSITION FREQUENCY f_T (MHz)
200
160
120
80
40
0
-0
-20
-40
-60
-80
-100
COLLECTOR CURRENT I_C (mA)


P_c —— T_a
COLLECTOR POWER DISSIPATION P_c (W)
0.5
0.4
0.3
0.2
0.1
0.0
0
25
50
75
100
125
150
AMBIENT TEMPERATURE T_a (℃)