Ordering number:EN5387

FX901

PNP Epitaxial Planar Silicon Transistor
N-Channel MOS Silicon FET
Silicon Schottky Barrier Diode
DC-DC Converter Applications

Features

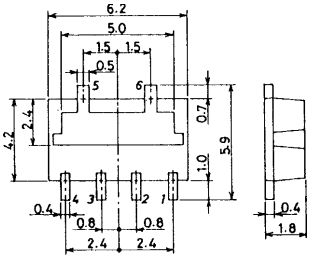
· Composite type with a PNP transistor and a 2.5V drive N-channel MOSFET with a built-in low forward-voltage Schottky barrier diode faciliteting high-density mounting.

Package Dimensions

unit:mm

2133

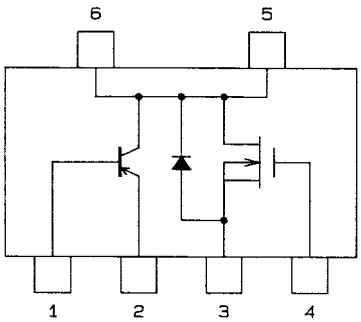
[FX901]



1:Base
2:Emitter
3:Anode, Source
4:Gate
5, 6:Common
(Collector, Cathode, Drain)

SANYO:XP5
(Bottom view)

Electrical Connection



Specifications

Absolute Maximum Ratings at Ta = 25˚C

Parameter	Symbol	Conditions	Ratings	Unit
Allowable Power Dissipation	P	Tc=25˚C, 1 unit	8	W
	P	Mounted on ceramic board (750mm^2×0.8mm) 1 unit	1.5	W
Total Power Dissipation	P_T	Mounted on ceramic board (750mm^2×0.8mm)	2	W
Storage Temperature	Tstg		–55 to +150	˚C
[TR]				
Collector-to-Base Voltage	V_{CBO}		–15	V
Collector-to-Emitter Voltage	V_{CEO}		–11	V
Emitter-to-Base Voltage	V_{EBO}		–7	V
Collector Current	I_C		–3	A
Collector Current (Pulse)	I_{CP}		–5	A
Base Current	I_B		–600	mA
Junction Temperature	Tj		150	˚C
[MOSFET]				
Drain-to-Source Voltage	V_{DSS}		11	V
Gate-to-Source Voltage	V_{GSS}		±10	V
Drain Current (DC)	I_D		2	A
Drain Current (Pulse)	I_{DP}	PW≤10μs, duty cycle≤1%	8	A
Channel Temperature	Tch		150	˚C
[SBD]				
Average Rectified Current	I_O		500	mA

· Marking:901

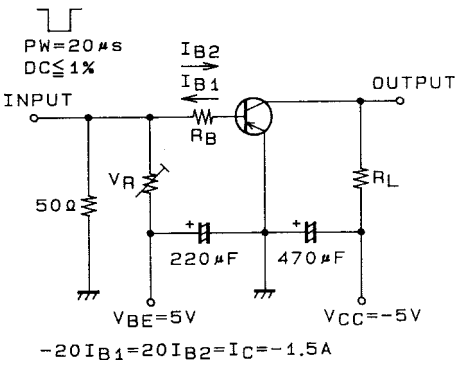
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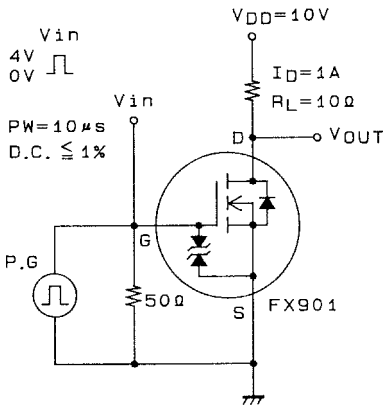
Electrical Characteristics at Ta = 25˚C

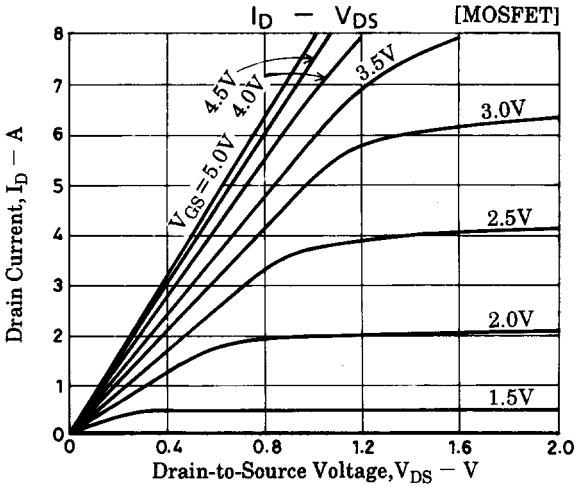
Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
[TR]						
Collector Cutoff Current	I_{CBO}	V_{CB}=–12V, I_E=0			–0.1	μA
Emitter Cutoff Current	I_{EBO}	V_{EB}=–6V, I_C=0			–0.1	μA
DC Current Gain	h_{FE}(1)	V_{CE}=–2V, I_C=–0.5A	140		560	
	h_{FE}(2)	V_{CE}=–2V, I_C=–3A	70			
Gain-Bandwidth Product	f_T	V_{CE}=–2V, I_C=–0.3A		400		MHz
Output Capacitance	Cob	V_{CB}=–10V, f=1MHz		26		pF
C-E Saturation Voltage	$V_{CE(sat)}$	I_C=–1.5A, I_B=–30mA		–0.22	–0.4	V
B-E Saturation Voltage	$V_{BE(sat)}$	I_C=–1.5A, I_B=–30mA		–0.9	–1.2	V
C-B Breakdown Voltage	$V_{(BR)CBO}$	I_C=–10μA, I_E=0	–15			V
C-E Breakdown Voltage	$V_{(BR)CEO}$	I_C=–1mA, R_{BE}=∞	–11			V
E-B Breakdown Voltage	$V_{(BR)EBO}$	I_E=–10μA, I_C=0	–7			V
Turn-ON time	t_{on}	See specified Test Citcuit		25		ns
Storage Time	t_{stg}	See specified Test Circuit		200		ns
Fall Time	t_f	See specified Test Circuit		10		ns
[MOSFET]						
D-S Breakdown Voltage	$V_{(BR)DSS}$	I_D=1mA, V_{GS}=0	11			V
Zero-Gate Voltage Drain Current	I_{DSS}	V_{DS}=10.4V, V_{GS}=0			400	μA
Gate-to-Source Leakage Current	I_{GSS}	V_{GS}=±8V, V_{DS}=0			±10	μA
Cutoff Voltage	$V_{GS(off)}$	V_{DS}=10V, I_D=1mA	0.5		1.5	V
Forward Transfer Admittance	$\|Y_{fs}\|$	V_{DS}=10V, I_D=1A	1.8	2.8		S
Static Drain-to-Source ON-Resistance	$R_{DS(on)}$	I_D=1A, V_{GS}=4V		140	200	mΩ
	$R_{DS(on)}$	I_D=500mA, V_{GS}=2.5V		200	320	mΩ
Input Capacitance	Ciss	V_{DS}=10V, f=1MHz		185		pF
Output Capacitance	Coss	V_{DS}=10V, f=1MHz		210		pF
Reverse Transfer Capacitance	Crss	V_{DS}=10V, f=1MHz		40		pF
Turn-ON Delay Time	$t_{d(on)}$	See specified Test Circuit		15		ns
Rise Time	t_r	See specified Test Circuit		40		ns
Turn-OFF Delay TIme	$t_{d(off)}$	See specified Test Circuit		50		ns
Fall Time	t_f	See specified Test Circuit		35		ns
[SBD]						
Forward Voltage	V_F	I_F=500mA		0.4	0.45	V
Reverse Recovery Time	t_{rr}	I_F=500mA, di/dt=50A/μs		20	30	ns

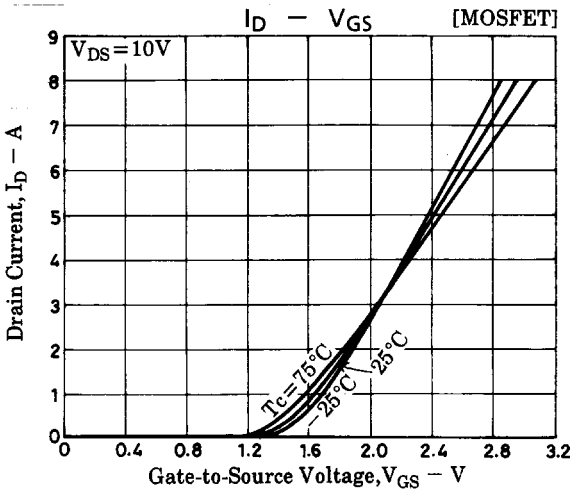
Swithing Time Test CIrcuit [TR]

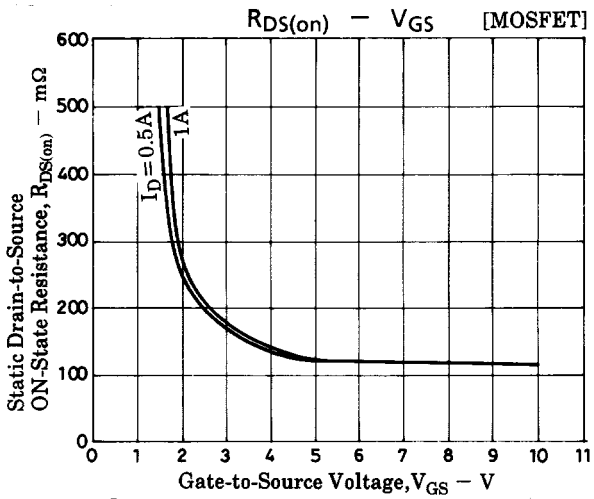


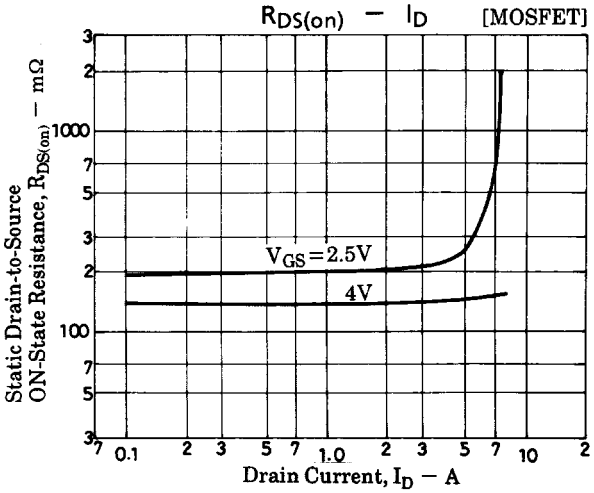
Trr Test Circuit [MOSFET]

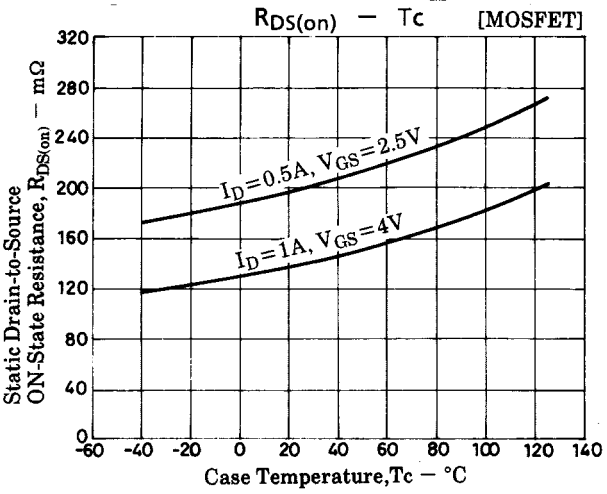


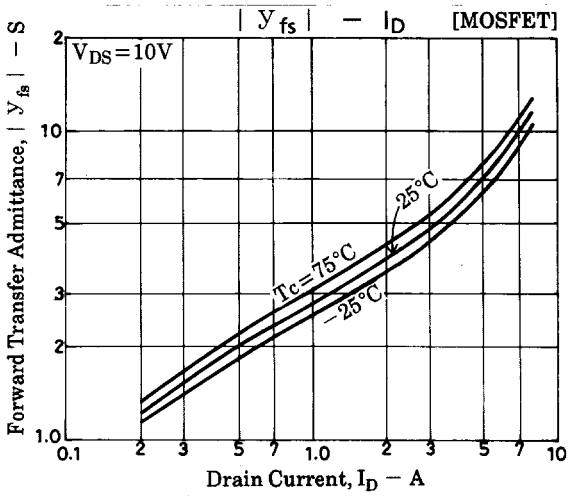

I_D — V_{DS} [MOSFET]
Drain Current, I_D — A
Drain-to-Source Voltage, V_{DS} — V
V_{GS}=5.0V
4.5V
4.0V
3.5V
3.0V
2.5V
2.0V
1.5V

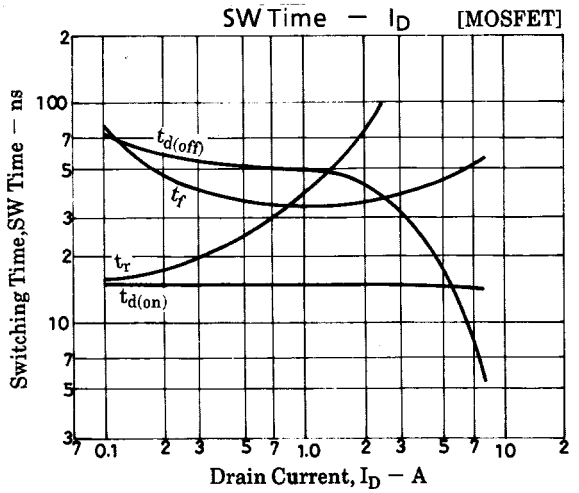

I_D — V_{GS} [MOSFET]
V_{DS}=10V
Drain Current, I_D — A
Gate-to-Source Voltage, V_{GS} — V
Tc=75°C
25°C
−25°C

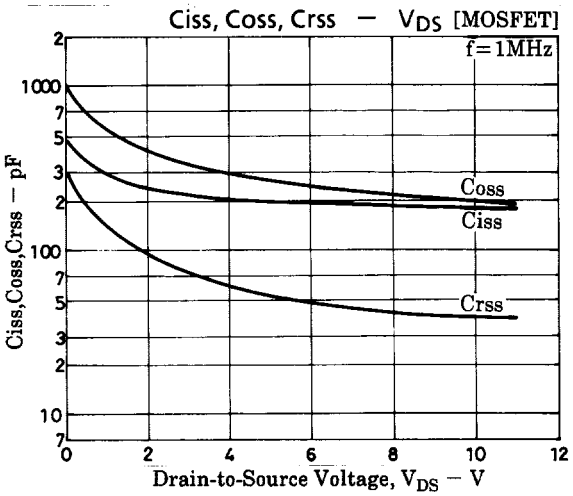

$R_{DS(on)}$ — V_{GS} [MOSFET]
Static Drain-to-Source ON-State Resistance, $R_{DS(on)}$ — mΩ
Gate-to-Source Voltage, V_{GS} — V
I_D=0.5A
1A

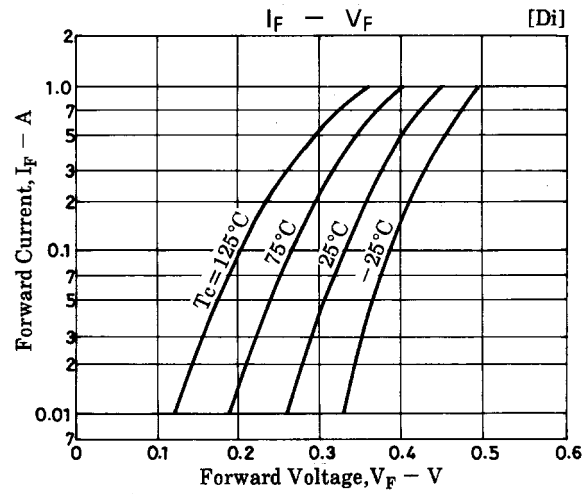

$R_{DS(on)}$ — I_D [MOSFET]
Static Drain-to-Source ON-State Resistance, $R_{DS(on)}$ — mΩ
Drain Current, I_D — A
V_{GS}=2.5V
4V

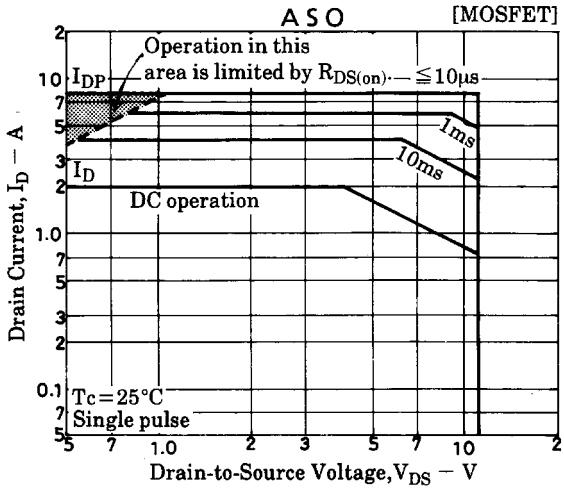

$R_{DS(on)}$ — Tc [MOSFET]
Static Drain-to-Source ON-State Resistance, $R_{DS(on)}$ — mΩ
Case Temperature, Tc — °C
I_D=0.5A, V_{GS}=2.5V
I_D=1A, V_{GS}=4V

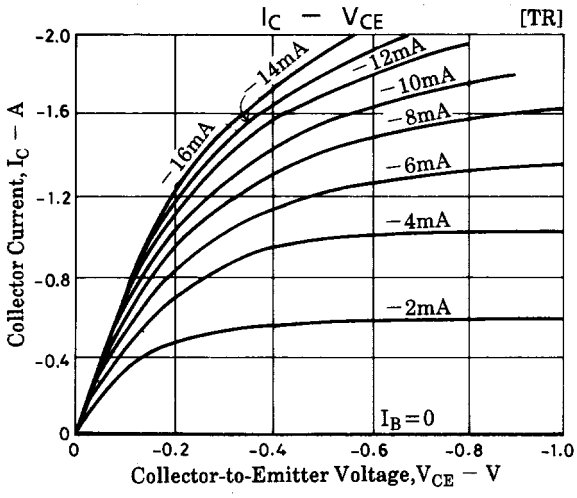

$|y_{fs}|$ — I_D [MOSFET]
Forward Transfer Admittance, $|y_{fs}|$ — S
Drain Current, I_D — A
V_{DS}=10V
25°C
Tc=75°C
−25°C

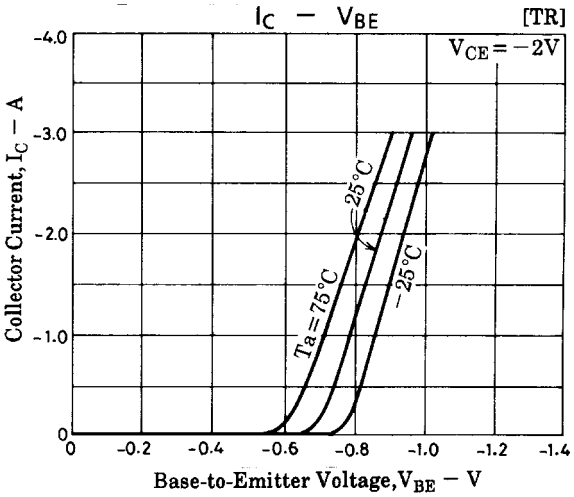

SW Time — I_D [MOSFET]
Switching Time, SW Time — ns
Drain Current, I_D — A
$t_{d(off)}$
t_f
t_r
$t_{d(on)}$

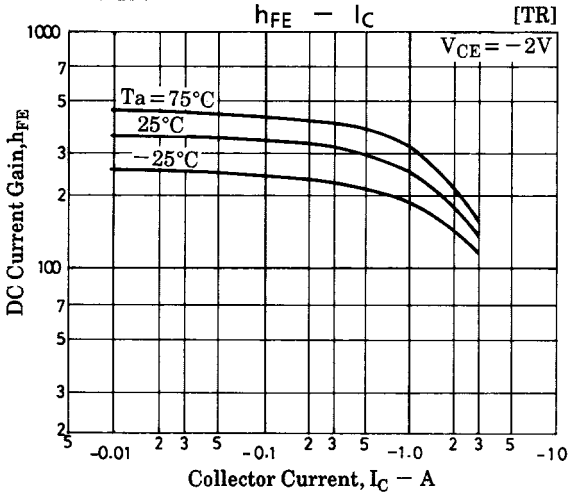

Ciss, Coss, Crss — V_{DS} [MOSFET]
f=1MHz
Ciss, Coss, Crss — pF
Drain-to-Source Voltage, V_{DS} — V
Coss
Ciss
Crss

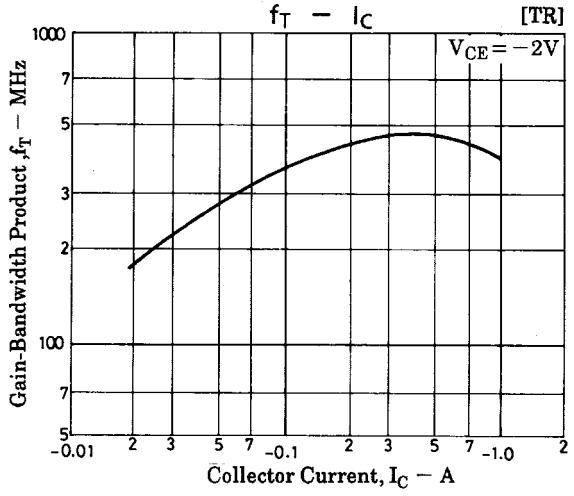

IF – VF
[Di]
Forward Current, IF – A
Forward Voltage, VF – V
Tc=125°C
75°C
25°C
–25°C

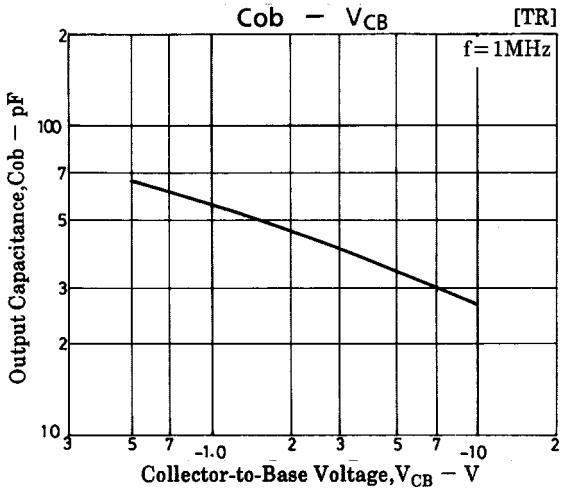

ASO
[MOSFET]
Operation in this area is limited by RDS(on)
IDP
ID
1ms
10ms
≦10μs
DC operation
Tc=25°C
Single pulse
Drain Current, ID – A
Drain-to-Source Voltage, VDS – V

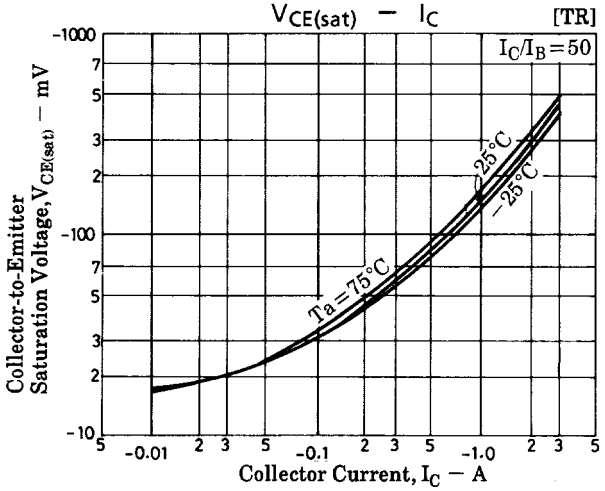

IC – VCE
[TR]
–16mA
–14mA
–12mA
–10mA
–8mA
–6mA
–4mA
–2mA
IB=0
Collector Current, IC – A
Collector-to-Emitter Voltage, VCE – V

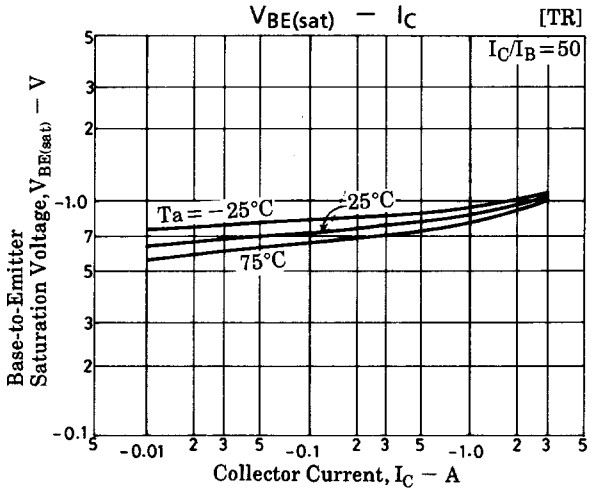

IC – VBE
[TR]
VCE=–2V
25°C
Ta=75°C
–25°C
Collector Current, IC – A
Base-to-Emitter Voltage, VBE – V

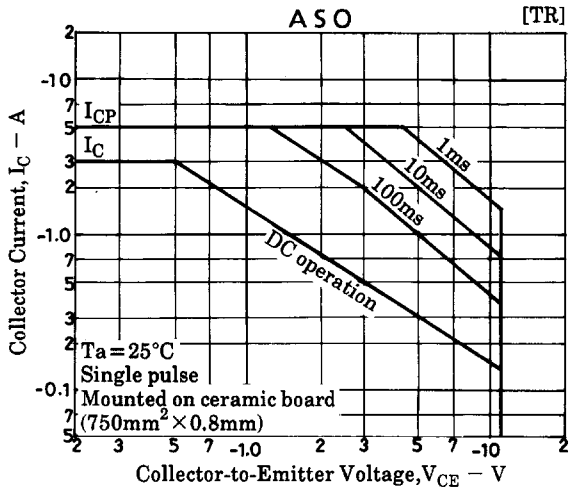

hFE – IC
[TR]
VCE=–2V
Ta=75°C
25°C
–25°C
DC Current Gain, hFE
Collector Current, IC – A

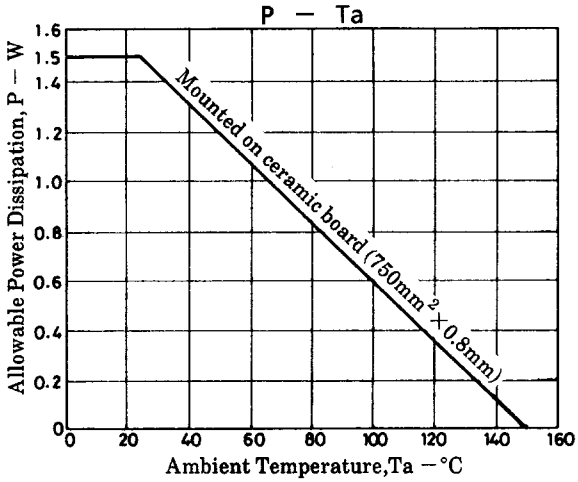

fT – IC
[TR]
VCE=–2V
Gain-Bandwidth Product, fT – MHz
Collector Current, IC – A

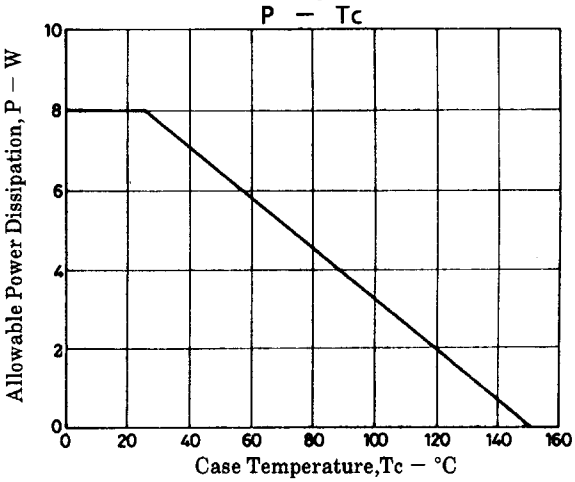

Cob – VCB
[TR]
f=1MHz
Output Capacitance, Cob – pF
Collector-to-Base Voltage, VCB – V

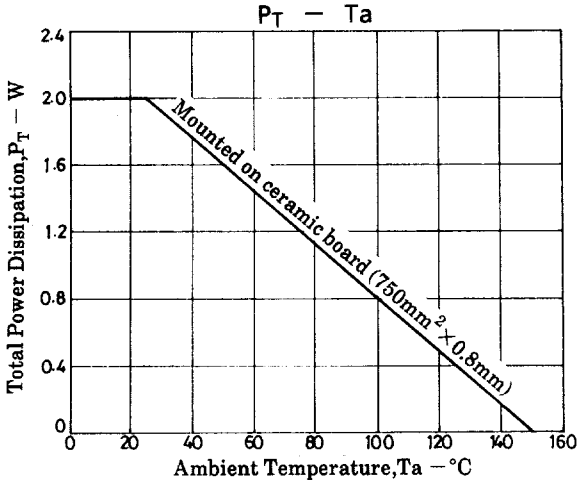

VCE(sat) – IC
[TR]
IC/IB=50
25°C
–25°C
Ta=75°C
Collector-to-Emitter Saturation Voltage, VCE(sat) – mV
Collector Current, IC – A











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