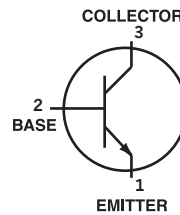
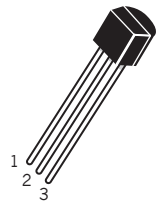


NPN General Purpose Transistors

 Lead(Pb)-Free



TO-92



MAXIMUM RATINGS

Rating	Symbol	2222	2222A	Unit
Collector-Emitter Voltage	V_{ECO}	30	40	Vdc
Collector-Base Voltage	V_{CBO}	60	75	Vdc
Emitter-Base Voltage	V_{EBO}	5.0	6.0	Vdc
Collector Current-Continuous	I_C	600		mAdc

THERMAL CHARACTERISTICS

Characteristics	Symbol	Max	Unit
Total Device Dissipation FR-5 Board (1) $T_A=25^\circ\text{C}$ Derate above 25°C	P_D	225	mW
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	1.8	$\text{mW}/^\circ\text{C}$
Total Device Dissipation Alumina Substrate, (2) $T_A=25^\circ\text{C}$ Derate above 25°C	P_D	300	mW
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	2.4	$\text{mW}/^\circ\text{C}$
Junction and Storage, Temperature	T_J, T_{stg}	-55 to +150	$^\circ\text{C}$

ELECTRICAL CHARACTERISTICS

Characteristics	Symbol	Min	Max	Unit
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OFF CHARACTERISTICS

Collector-Emitter Breakdown Voltage ($I_C=10\text{ mAdc}, I_B=0$)	MPS 2222 MPS 2222A	$V_{(BR)CEO}$	30 40	- -	Vdc
Collector-Base Breakdown Voltage ($I_C=10\text{ }\mu\text{Adc}, I_E=0$)	MPS 2222 MPS 2222A	$V_{(BR)CBO}$	60 75	- -	Vdc
Emitter-Base Breakdown Voltage ($I_E=10\text{ }\mu\text{Adc}, I_C=0$)	MPS 2222 MPS 2222A	$V_{(BR)EBO}$	5.0 6.0	- -	Vdc
Collector Cutoff Current ($V_{CE}=60\text{ Vdc}, V_{EB}(\text{off})=3.0\text{ Vdc}$)	MPS 2222A	I_{CEX}	-	10	nAdc
Collector Cutoff Current ($V_{CB}=50\text{ Vdc}, I_E=0$)	MPS 2222	I_{CBO}	-	0.01	nAdc
($V_{CB}=60\text{ Vdc}, I_E=0$)	MPS 2222A		-	0.01	
($V_{CB}=50\text{ Vdc}, I_E=0, T_A=125^\circ\text{C}$)	MPS 2222		-	10	
($V_{CB}=60\text{ Vdc}, I_E=0, T_A=125^\circ\text{C}$)	MPS 2222A		-	10	
Emitter Cutoff Current ($V_{EB}=3.0\text{ Vdc}, I_C=0$)	MPS 2222A	I_{EBO}	-	100	nAdc
Base Cutoff Current ($V_{CE}=60\text{ Vdc}, V_{EB}(\text{off})=3.0\text{ Vdc}$)	MPS 2222A	I_{BL}	-	20	nAdc

1.FR-5=1.0 x 0.75 x 0.062 in

2.Alumina=0.4 x 0.3 x 0.024 in. 99.5% alumina

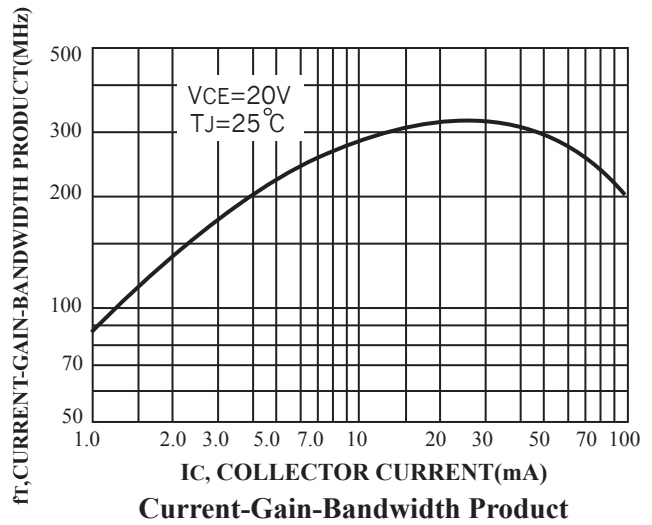
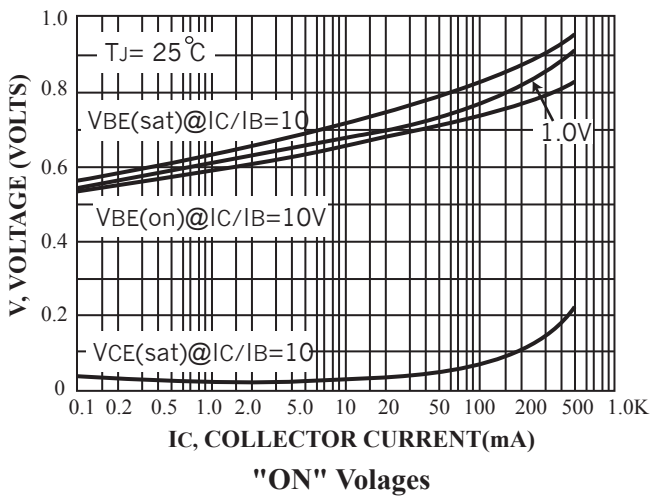
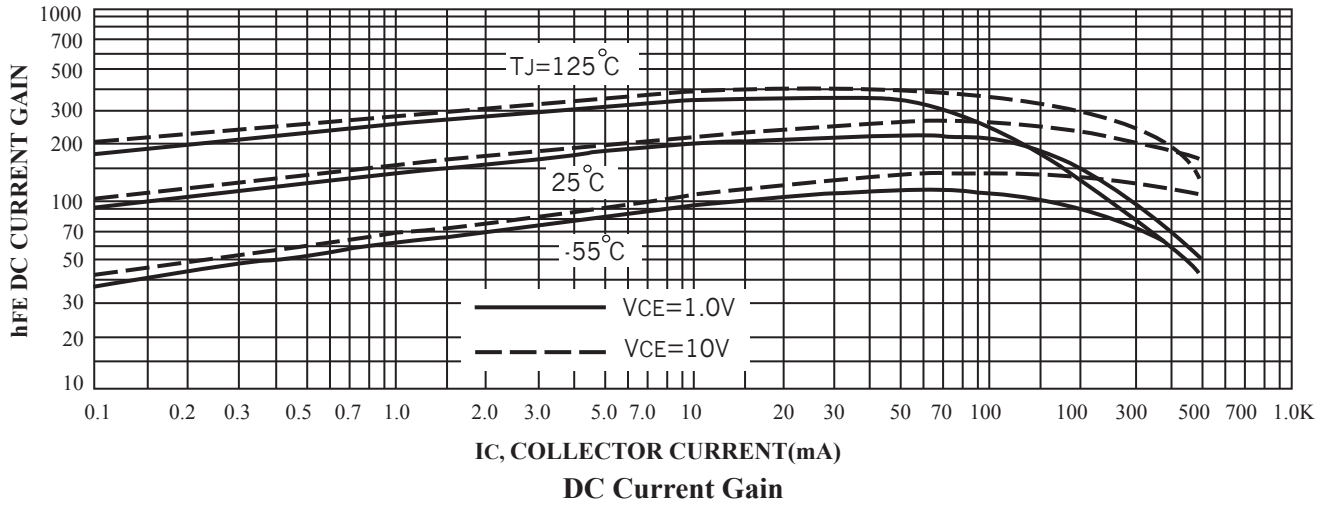
ELECTRICAL CHARACTERISTICS ($T_A=25^\circ\text{C}$ unless otherwise noted) (Continued)

Characteristics	Symbol	Min	Max	Unit
ON CHARACTERISTICS				
DC Current Gain ($I_C=0.1\text{ mAdc}$, $V_{CE}=10\text{ Vdc}$) ($I_C=1.0\text{ mAdc}$, $V_{CE}=10\text{ Vdc}$) ($I_C=10\text{ mAdc}$, $V_{CE}=10\text{ Vdc}$) ($I_C=10\text{ mAdc}$, $V_{CE}=10\text{ Vdc}$, $T_A=-55^\circ\text{C}$) ($I_C=150\text{ mAdc}$, $V_{CE}=10\text{ Vdc}$) (3) ($I_C=150\text{ mAdc}$, $V_{CE}=1.0\text{Vdc}$) (3) ($I_C=500\text{ mAdc}$, $V_{CE}=10\text{ Vdc}$) (3)	h_{FE}	35 50 75 35 100 50 30 40	- - - - 300 - - -	-
	MPS 2222A ONLY			
	MPS 2222 MPS 2222A			
Collector-Emitter Saturation Voltage (3) ($I_C=150\text{ mAdc}$, $I_B=15\text{ mAdc}$) ($I_C=500\text{ mAdc}$, $I_B=50\text{ mAdc}$)	$V_{CE(sat)}$	- - - -	0.4 0.3 1.6 1.0	Vdc
	MPS 2222 MPS 2222A			
	MPS 2222 MPS 2222A			
	MPS 2222 MPS 2222A			
Base-Emitter Saturation Voltage (3) ($I_C=150\text{ mAdc}$, $I_B=15\text{ mAdc}$) ($I_C=500\text{ mAdc}$, $I_B=50\text{ mAdc}$)	$V_{BE(sat)}$	- 0.6 - -	1.3 1.2 2.6 2.0	Vdc
	MPS 2222 MPS 2222A			
	MPS 2222 MPS 2222A			
	MPS 2222 MPS 2222A			

SMALL-SIGNAL CHARACTERISTICS

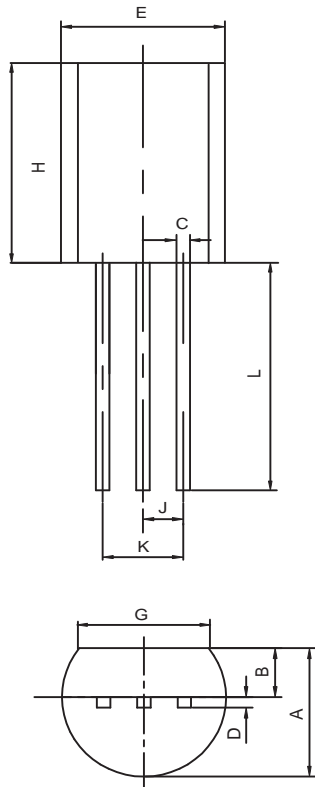
Current-Gain-Bandwidth Product (4) ($I_C=20\text{ mAdc}$, $V_{CE}=20\text{ Vdc}$, $f=100\text{ MHz}$)	MPS 2222 MPS 2222A	f_T	250 300	- -	MHz
Output Capacitance ($V_{CB}=10\text{ Vdc}$, $I_E=0$, $f=1.0\text{ MHz}$)	MPS 2222 MPS 2222A	C_{obo}	-	8.0	pF
Input Capacitance ($V_{EB}=0.5\text{ Vdc}$, $I_C=0$, $f=1.0\text{ MHz}$)	MPS 2222 MPS 2222A	C_{ibo}	- -	30 25	pF
Input Impedance ($I_C=1.0\text{ mAdc}$, $V_{CE}=10\text{ Vdc}$, $f=1.0\text{ kHz}$) ($I_C=10\text{ mAdc}$, $V_{CE}=10\text{ Vdc}$, $f=1.0\text{ kHz}$)	MPS 2222 MPS 2222A	h_{ie}	2.0 0.25	8.0 1.25	k
Voltage Feedback Ratio ($I_C=1.0\text{ mAdc}$, $V_{CE}=10\text{ Vdc}$, $f=1.0\text{ kHz}$) ($I_C=10\text{ mAdc}$, $V_{CE}=10\text{ Vdc}$, $f=1.0\text{ kHz}$)	MPS 2222 MPS 2222A	h_{re}	- -	8.0 4.0	$\times 10^{-4}$
Small-Signal Current Gain ($I_C=1.0\text{ mAdc}$, $V_{CE}=10\text{ Vdc}$, $f=1.0\text{ kHz}$) ($I_C=10\text{ mAdc}$, $V_{CE}=10\text{ Vdc}$, $f=1.0\text{ kHz}$)	MPS 2222 MPS 2222A	h_{fe}	50 75	300 375	-
Output Admittance ($I_C=1.0\text{ mAdc}$, $V_{CE}=10\text{ Vdc}$, $f=1.0\text{ kHz}$) ($I_C=10\text{ mAdc}$, $V_{CE}=10\text{ Vdc}$, $f=1.0\text{ kHz}$)	MPS 2222 MPS 2222A	h_{oe}	5.0 25	35 200	μmhos
Collector Base Time Constant ($I_E=20\text{ mAdc}$, $V_{CB}=20\text{ Vdc}$, $f=31.8\text{ MHz}$)	MPS 2222A	r_b, C_c	-	150	ps
Noise Figure ($I_C=100\text{ }\mu\text{A}$, $V_{CE}=10\text{ Vdc}$, $R_S=1.0\text{ k}$, $f=1.0\text{ kHz}$)	MPS 2222A	NF	-	4.0	dB

Typical Characteristics



TO-92 Outline Dimensions

unit:mm



TO-92		
Dim	Min	Max
A	3.30	3.70
B	1.10	1.40
C	0.38	0.55
D	0.36	0.51
E	4.40	4.70
G	3.43	-
H	4.30	4.70
J	1.270TYP	
K	2.44	2.64
L	14.10	14.50