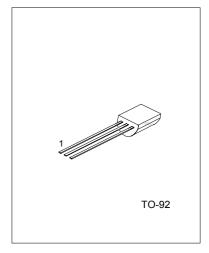
NPN MPSA05 PNP MPSA55

FEATURES

*Collector-Emitter Voltage: VcEo=60V *Collector Dissipation: P_D=625mW



1: EMITTER 2: BASE 3: COLLECTOR

ABSOLUTE MAXIMUM RATINGS (T_A=25°C, unless otherwise specified)

7 IDOOLO IL IVII VIII VIII I VIII VIII VIII	OO (1A 20 0, unicos 0	therwise specifica)	
PARAMETER	SYMBOL	RATING	UNIT
Collector-base voltage	Vсво	60	V
Collector-emitter voltage	VCEO	60	V
Emitter-base voltage	VEBO	4	V
Collector current - Continuous	lc	500	mA
Total device dissipation, @T _A =25°C	Pb	625	mW
Derate above 25°C		5	mW/°C
Total device dissipation, @T _C =25°C	Pb	1500	mW
Derate above 25°C		12	mW/°C
Junction Temperature	Tj	-55 ~ +150	°C
Storage Temperature	Tstg	-55 ~ +150	°C

THERMAL CHARACTERISTICS

PARAMETER	SYMBOL	MAX	UNIT
Thermal resistance, junction to ambient	RθJA (note)	200	°C/W
Thermal resistance, junction to case	Rejc	83.3	°C/W

Note: Reja is measured with the device soldered into a typical printed circuit board.

ELECTRICAL CHARACTERISTICS (Ta=25°C, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Collector-emitter breakdown voltage	$V_{(BR)CEO}$	$I_C=1.0$ mA, $I_B=0$	60			V
(note 1)	, ,					
Emitter-base breakdown voltage	$V_{(BR)EBO}$	I _E =100μA, Ic=0	4			V
Collector cutoff current	I _{CES}	V_{CE} =60V, I_{B} =0			0.1	μΑ
Collector cutoff current	I _{CBO}	V_{CB} =60V, I_E =0			0.1	μА

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PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
ON CHARACTERISTICS						
DC current gain	hFE	I _C =10mA, V _{CE} =1V	100			
		I _C =100mA, V _{CE} =1V	100			
Collector-emitter saturation voltage	V _{CE(sat)}	I _C =100mA, I _B =10mA			0.25	V
Base-emitter on voltage	$V_{BE(on)}$	I _C =100mA, V _{CE} =1V			1.2	V
SMALL-SIGNAL CHARACTERISTICS						
Current gain bandwidth product	f _T	MPSA05:				
(note 2)		I _C =10mA, V _{CE} =2V, f=100MHz	100			MHz
		MPSA55:				
		I _C =100mA, V _{CE} =1V, f=100MHz	50			MHz

Note 1: Pulse test: PW<=300µs, Duty Cycle<=2%

Note 2: f_T is defined as the frequency at which Ihfel extrapolates to unity.

SWITCHING TIME TEST CIRCUITS

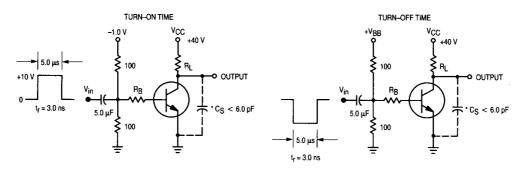
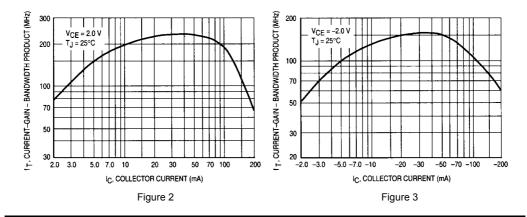


Figure 1

(Note: Total shunt capacitance of test jig and connectors for PNP test circuits, reverse all voltage polarities.)

MPSA05 MPSA55

CURRENT-GAIN BANDWIDTH PRODUCT



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2

30

20

SECOND BREAKDOWN LIMIT

5.0 7.0 10

VCE, COLLECTOR-EMITTER VOLTAGE (VOLTS)

Figure 8

MPSA05 MPSA55 **CAPACITANCE** 50 C, CAPACITANCE (pF) C, CAPACITANCE (pF) 20 20 6.0 5.0 L -0.2 0.2 2.0 5.0 50 -2.0 -5.0 -10 1.0 VR, REVERSE VOLTAGE (VOLTS) VR, REVERSE VOLTAGE (VOLTS) Figure 4 Figure 5 **SWITCHING TIME** 700 700 500 500 200 t, TIME (ns) t, TIME (ns) 100 70 100 50 $V_{CC} = -40$ $I_{C}/I_{B} = 10$ 20 -50 -70 -100 -200 -300 -500 5.0 7.0 10 50 70 100 300 -5.0 -7.0 -10 IC, COLLECTOR CURRENT (mA) IC, COLLECTOR CURRENT (mA) Figure 7 Figure 6 ACTIVE-REGION SAFE OPERATING AREA 1.0 k 700 -700 500 -500 IC, COLLECTOR CURRENT (mA) 300 200 100 70 50 **CURRENT LIMIT** CURRENT LIMIT

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50 70 -20

-50 -70 -100

-30

SECOND BREAKDOWN LIMIT

VCE, COLLECTOR-EMITTER VOLTAGE (VOLTS)

Figure 9

-3.0 -5.0 -7.0 -10

0.05 0.1 0.2

2.0

IC, COLLECTOR CURRENT (mA)
Figure 14

MPSA05 MPSA55 DC CURRENT GAIN VCE = hFE, DC CURRENT GAIN hee, DC CURRENT GAIN 2.0 3.0 5.0 10 100 200 300 500 -0.5 -1.0 -2.0 20 30 50 -50 -100 -200 -5.0 -10-20 IC. COLLECTOR CURRENT (mA) IC, COLLECTOR CURRENT (mA) Figure 10 Figure 11 "ON" VOLTAGES T1 = 25°C $T_J = 25^{\circ}C$ VOLTAGE (VOLTS) V, VOLTAGE (VOLTS) 2.0 -1.0 -2.0 -10 IC, COLLECTOR CURRENT (mA) IC, COLLECTOR CURRENT (mA) Figure 12 Figure 13 **COLLECTOR SATURATION REGION** V_{CE}, COLLECTOR-EMITTER VOLTAGE (VOLTS) COLLECTOR-EMITTER VOLTAGE (VOLTS) IC = 250 mA IC = -50 mA l_C = 500 mA -500 mA 0.6

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-0.05 -0.1 -0.2

-2.0

IB, BASE CURRENT (mA)

Figure 15

MPSA05

MPSA55

BASE-EMITTER TEMPERATURE COEFFICIENT

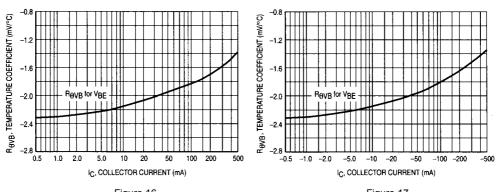


Figure 16 Figure 17

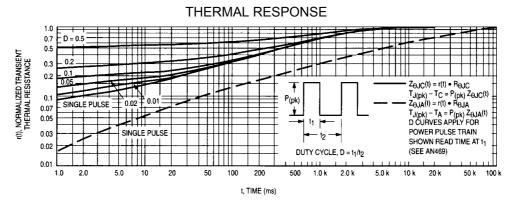


Figure 18

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