MPS6602 and MPS6652 are Preferred Devices

Amplifier Transistors

Features

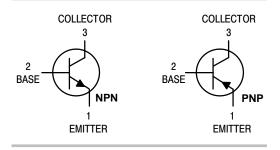
- Voltage and Current are Negative for PNP Transistors
- Pb-Free Packages are Available*

MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Collector – Emitter Voltage MPS6601/6651 MPS6602/6652	V _{CEO}	25 40	Vdc
Collector – Base Voltage MPS6601/6651 MPS6602/6652	V _{CBO}	25 30	Vdc
Emitter-Base Voltage	V _{EBO}	4.0	Vdc
Collector Current – Continuous	Ι _C	1000	mAdc
Total Device Dissipation @ T _A = 25°C Derate above 25°C	PD	625 5.0	W mW/°C
Total Device Dissipation @ T _C = 25°C Derate above 25°C	P _D	1.5 12	W mW/°C
Operating and Storage Junction Temperature Range	T _J , T _{stg}	-55 to +150	°C

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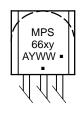
THERMAL CHARACTERISTICS

Characteristic	Symbol	Max	Unit
Thermal Resistance, Junction-to-Ambient (Note 1)	$R_{\theta JA}$	200	°C/W
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	83.3	°C/W

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

1. R_{θJA} is measured with the device soldered into a typical printed circuit board.

MARKING DIAGRAM



MPS66xy	= Device Code
	x = 0 or 5
	y = 1 or 2
A	= Assembly Location
Υ	= Year
WW	= Work Week
•	= Pb-Free Package

(Note: Microdot may be in either location)

ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 7 of this data sheet.

*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

Preferred devices are recommended choices for future use and best overall value.

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

Characteristic		Symbol	Min	Мах	Unit
OFF CHARACTERISTICS					
Collector – Emitter Breakdown Voltage ($I_C = 1.0 \text{ mAdc}, I_B = 0$)	MPS6601/6651 MPS6602/6652	V _(BR) CEO	25 40		Vdc
Collector – Base Breakdown Voltage $(I_C = 100 \ \mu Adc, I_E = 0)$	MPS6601/6651 MPS6602/6652	V _{(BR)CBO}	25 40		Vdc
Emitter – Base Breakdown Voltage $(I_E = 10 \ \mu Adc, I_C = 0)$		V _{(BR)EBO}	4.0	_	Vdc
Collector Cutoff Current $(V_{CE} = 25 \text{ Vdc}, I_B = 0)$ $(V_{CE} = 30 \text{ Vdc}, I_B = 0)$	MPS6601/6651 MPS6602/6652	I _{CES}		0.1 0.1	μAdc
Collector Cutoff Current ($V_{CB} = 25 \text{ Vdc}, I_E = 0$) ($V_{CB} = 30 \text{ Vdc}, I_E = 0$)	MPS6601/6651 MPS6602/6652	I _{CBO}		0.1 0.1	μAdc
ON CHARACTERISTICS					
$ DC Current Gain \\ (I_C = 100 mAdc, V_{CE} = 1.0 Vdc) \\ (I_C = 500 mAdc, V_{CE} = 1.0 Vdc) \\ (I_C = 1000 mAdc, V_{CE} = 1.0 Vdc) $		h _{FE}	50 50 30	- - -	_
Collector – Emitter Saturation Voltage ($I_C = 1000 \text{ mAdc}$, $I_B = 100 \text{ mAdc}$)		V _{CE(sat)}	_	0.6	Vdc
Base–Emitter On Voltage (I _C = 500 mAdc, V _{CE} = 1.0 Vdc)		$V_{BE(on)}$	_	1.2	Vdc
SMALL-SIGNAL CHARACTERISTICS	· · · ·				•
Current-Gain — Bandwidth Product ($I_C = 50$ mAdc, $V_{CE} = 10$ Vdc, f = 100 MH	łz)	f _T	100	_	MHz
Output Capacitance (V _{CB} = 10 Vdc, I _E = 0, f = 1.0 MHz)		C _{obo}	_	30	pF
SWITCHING CHARACTERISTICS					
Delay Time		t _d	-	25	ns
Rise Time	$(V_{CC} = 40 \text{ Vdc}, I_C = 500 \text{ mAdc},$	t _r	-	30	ns
Storage Time	$I_{B1} = 50 \text{ mAdc},$ $t_p \ge 300 \text{ ns Duty Cycle})$	t _s	-	250	ns
Fall Time		t _f	-	50	ns

MPS6601, MPS6602 (NPN) MPS6651, MPS6652 (PNP)

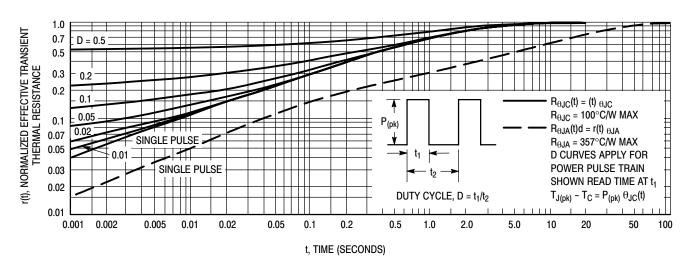
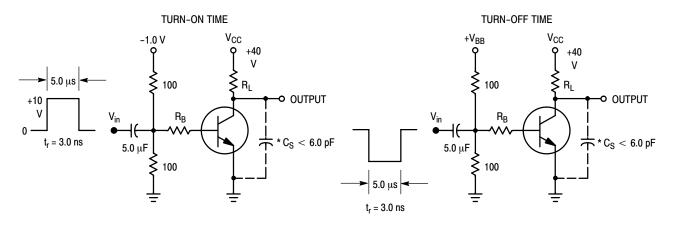
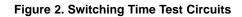
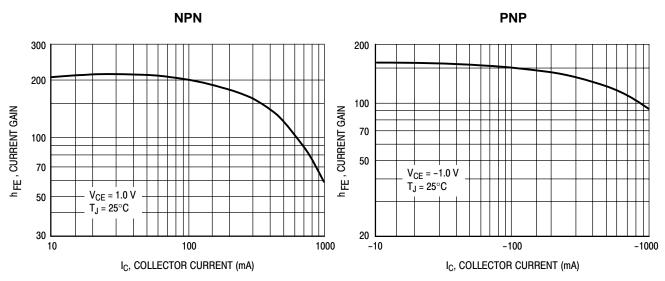


Figure 1. Thermal Response



*Total Shunt Capacitance of Test Jig and Connectors For PNP Test Circuits, Reverse All Voltage Polarities









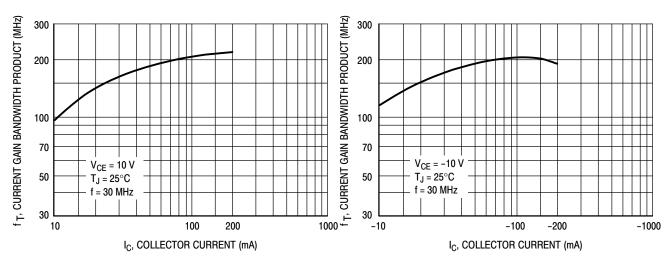
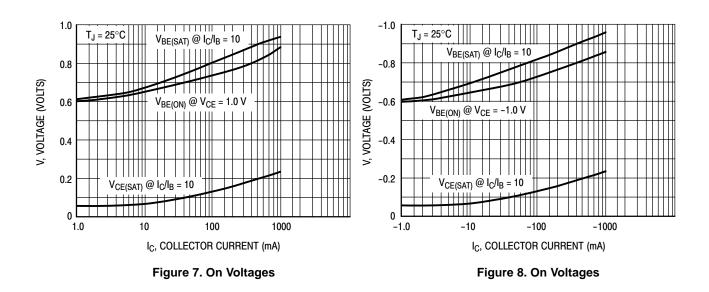
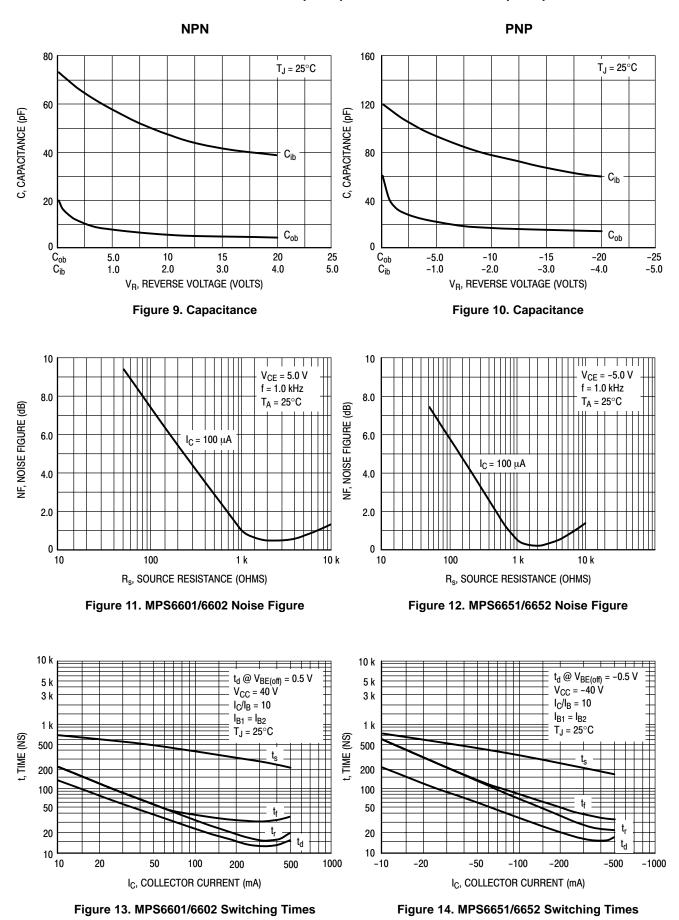


Figure 5. Current Gain Bandwidth Product

Figure 6. Current Gain Bandwidth Product





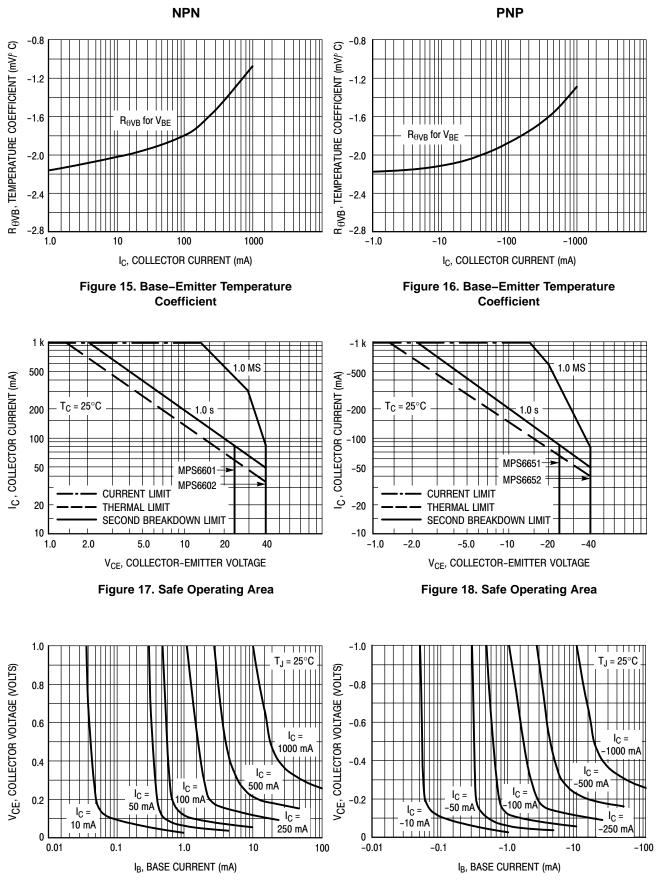


Figure 19. MPS6601/6602 Saturation Region

Figure 20. MPS6651/6652 Saturation Region

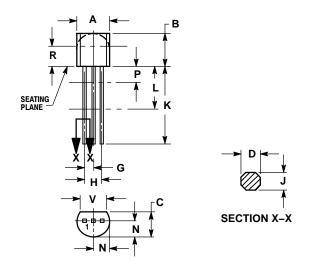
ORDERING INFORMATION

Device	Package	Shipping [†]	
MPS6601	TO-92 (TO-226)	5000 Units / Box	
MPS6601G	TO-92 (TO-226) (Pb-Free)		
MPS6601RLRA	TO-92 (TO-226)		
MPS6601RLRAG	TO-92 (TO-226) (Pb-Free)	2000 Units / Tape & Reel	
MPS6602	TO-92 (TO-226)		
MPS6602G	TO-92 (TO-226) (Pb-Free)	5000 Units / Box	
MPS6602RLRA	TO-92 (TO-226)		
MPS6602RLRAG	TO-92 (TO-226) (Pb-Free)	2000 Units / Tape & Reel	
MPS6651	TO-92 (TO-226)		
MPS6651G	TO-92 (TO-226) (Pb-Free)	5000 Units / Box	
MPS6652	TO-92 (TO-226)		
MPS6652G	TO-92 (TO-226) (Pb-Free)	5000 Units / Box	
MPS6652RLRA	TO-92 (TO-226)		
MPS6652RLRAG	TO-92 (TO-226) (Pb-Free)	2000 Units / Tape & Reel	
MPS6652RLRP	TO-92 (TO-226)	2000 Units / Tape & Ammo Box	
MPS6652RLRPG	TO-92 (TO-226) (Pb-Free)		

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

PACKAGE DIMENSIONS

TO-92 (TO-226) CASE 29-11 **ISSUE AL**



NOTES:

- DIMENSIONING AND TOLERANCING PER ANSI 1. Y14.5M, 1982.
- 2
- CONTROLLING DIMENSION: INCH. CONTOUR OF PACKAGE BEYOND DIMENSION R 3.
- IS UNCONTROLLED. LEAD DIMENSION IS UNCONTROLLED IN P AND 4. BEYOND DIMENSION K MINIMUM.

	INCHES		MILLIMETERS	
DIM	MIN	MAX	MIN	MAX
Α	0.175	0.205	4.45	5.20
В	0.170	0.210	4.32	5.33
С	0.125	0.165	3.18	4.19
D	0.016	0.021	0.407	0.533
G	0.045	0.055	1.15	1.39
Η	0.095	0.105	2.42	2.66
L	0.015	0.020	0.39	0.50
Κ	0.500		12.70	
Г	0.250		6.35	
Ν	0.080	0.105	2.04	2.66
Ρ		0.100		2.54
R	0.115		2.93	
٧	0.135		3.43	

STYLE 1: PIN 1. EMITTER

BASE 2. 3.

COLLECTOR

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