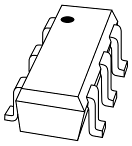


PMBFJ620

Dual N-channel field-effect transistor

Rev. 01 — 11 May 2004 Product data sheet

1. Product profile

1.1 General description

Two N-channel symmetrical junction field-effect transistors in a SOT363 package.

CAUTION

This device is sensitive to electrostatic discharge (ESD). Therefore care should be taken during transport and handling.

1.2 Features

- Two field effect transistors in a single package
- Low noise
- Interchangeability of drain and source connections
- High gain.

1.3 Applications

- AM input stage in car radios
- VHF amplifiers
- Oscillators and mixers.

1.4 Quick reference data

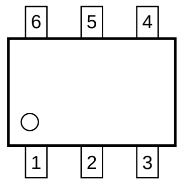
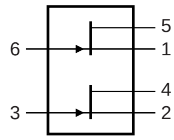
Table 1: Quick reference data

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Per FET						
V_{DS}	drain-source voltage		-	-	±25	V
V_{GSoff}	gate-source cut-off voltage	V_{DS} = 10 V; I_D = 1 μA	–2	-	–6.5	V
I_{DSS}	drain current	V_{GS} = 0 V; V_{DS} = 10 V	24	-	60	mA
P_{tot}	total power dissipation	$T_s \leq 90$ °C	-	-	190	mW
$\lvert y_{fs} \rvert$	forward transfer admittance	V_{DS} = 10 V; I_D = 10 mA	10	-	-	mS

PHILIPS

2. Pinning information

Table 2: Discrete pinning information

Pin	Description	Simplified outline	Symbol
1	source (1)		
2	source (2)		
3	gate (2)		
4	drain (2)		
5	drain (1)		
6	gate (1)		

3. Ordering information

Table 3: Ordering information

Type number	Package		
	Name	Description	Version
PMBFJ620	-	plastic surface mounted package; 6 leads	SOT363

4. Marking

Table 4: Marking

Type number	Marking code [1]
PMBFJ620	A8*

[1] * = p: made in Hong Kong.
* = t: made in Malaysia.
* = W: made in China.

5. Limiting values

Table 5: Limiting values

In accordance with the Absolute Maximum Rating System (IEC 60134).

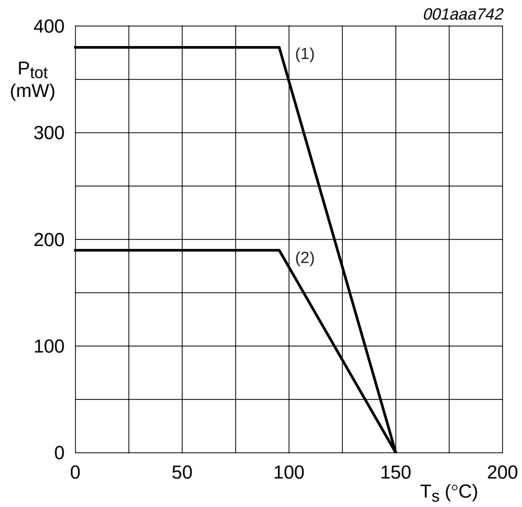
Symbol	Parameter	Conditions	Min	Max	Unit
Per FET					
V_{DS}	drain-source voltage		-	±25	V
V_{GSO}	gate-source voltage	open drain	-	–25	V
V_{GDO}	drain-gate voltage	open source	-	–25	V
I_G	forward gate current (DC)		-	50	mA
P_{tot}	total power dissipation	$T_s \leq 90$ °C	-	190	mW
T_{stg}	storage temperature		–65	+150	°C
T_j	junction temperature		-	150	°C

6. Thermal characteristics

Table 6: Thermal characteristics

Symbol	Parameter	Conditions		Typ	Unit
$R_{th(j-s)}$	thermal resistance from junction to soldering points	single loaded	[1]	315	K/W
		double loaded	[1]	160	K/W

[1] T_s is the temperature at the soldering point of the gate pins, see Figure 1.



(1) Double loaded.

(2) Single loaded.

Fig 1. Power derating curve.

7. Static characteristics

Table 7: Characteristics

T_j = 25 °C unless otherwise specified.

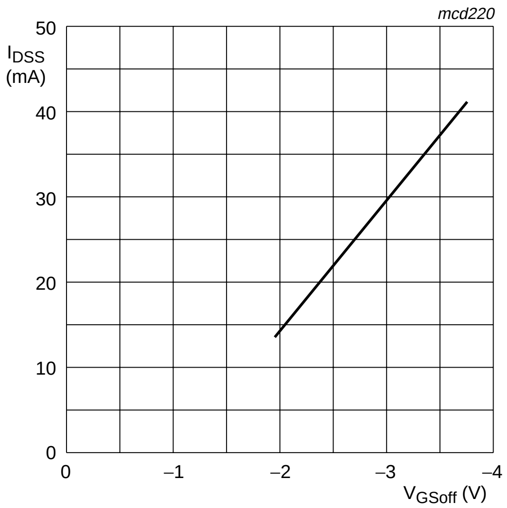
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Per FET						
$V_{(BR)GSS}$	gate-source breakdown voltage	I_G = –1 μA; V_{DS} = 0 V	–25	-	-	V
V_{GSoff}	gate-source cut-off voltage	I_D = 1 μA; V_{DS} = 10 V	–2	-	–6.5	V
V_{GSS}	gate-source forward voltage	I_G = 1 mA; V_{DS} = 0 V	-	-	1	V
I_{DSS}	drain-source leakage current	V_{DS} = 10 V; V_{GS} = 0 V	24	-	60	mA
I_{GSS}	gate-source leakage current	V_{GS} = –15 V; V_{DS} = 0 V	-	-	–1	nA
R_{DSon}	drain-source on-state resistance	V_{GS} = 0 V; V_{DS} = 100 mV	-	50	-	Ω
$\|y_{fs}\|$	common source forward transfer admittance	I_D = 10 mA; V_{DS} = 10 V	10	-	-	mS
$\|y_{os}\|$	common source output admittance	I_D = 10 mA; V_{DS} = 10 V	-	-	250	μS

8. Dynamic characteristics

Table 8: Characteristics

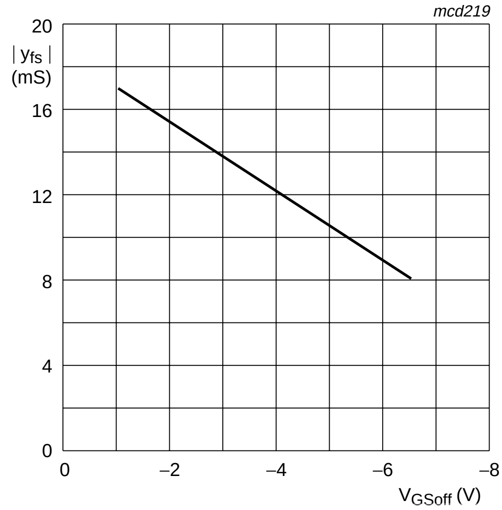
T_j = 25 °C unless otherwise specified.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
Per FET						
C_{iss}	input capacitance	V_{DS} = 10 V; V_{GS} = –10 V; f =1 MHz	-	3	5	pF
		V_{DS} = 10 V; V_{GS} = 0 V; T_{amb} = 25 °C	-	6	-	pF
C_{rss}	reverse transfer capacitance	V_{DS} = 0 V; V_{GS} = –10 V; f = 1 MHz	-	1.3	2.5	pF
g_{is}	common source input conductance	V_{DS} = 10 V; I_D = 10 mA; f = 100 MHz	-	200	-	μS
		V_{DS} = 10 V; I_D = 10 mA; f = 450 MHz	-	3	-	mS
g_{fs}	common source transfer conductance	V_{DS} = 10 V; I_D = 10 mA; f = 100 MHz	-	13	-	mS
		V_{DS} = 10 V; I_D = 10 mA; f = 450 MHz	-	12	-	mS
g_{rs}	common source reverse conductance	V_{DS} = 10 V; I_D = 10 mA; f = 100 MHz	-	–30	-	μS
		V_{DS} = 10 V; I_D = 10 mA; f = 450 MHz	-	–450	-	μS
g_{os}	common source output conductance	V_{DS} = 10 V; I_D = 10 mA; f = 100 MHz	-	150	-	μS
		V_{DS} = 10 V; I_D = 10 mA; f = 450 MHz	-	400	-	μS
V_n	equivalent input noise voltage	V_{DS} = 10 V; I_D = 10 mA; f = 100 Hz	-	6	-	nV/√Hz



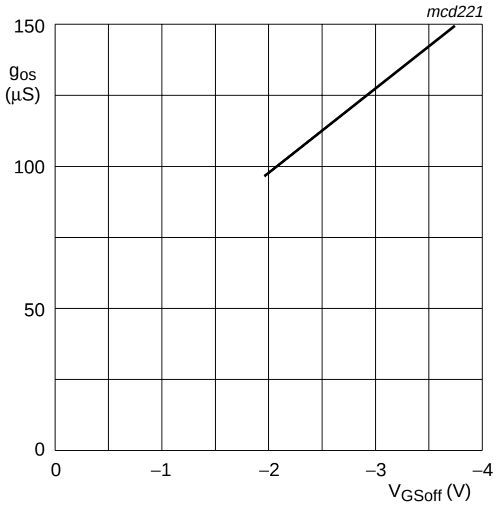
V_{DS} = 10 V; T_j = 25 °C.

Fig 2. Drain current as a function of gate-source cut-off voltage; typical values.



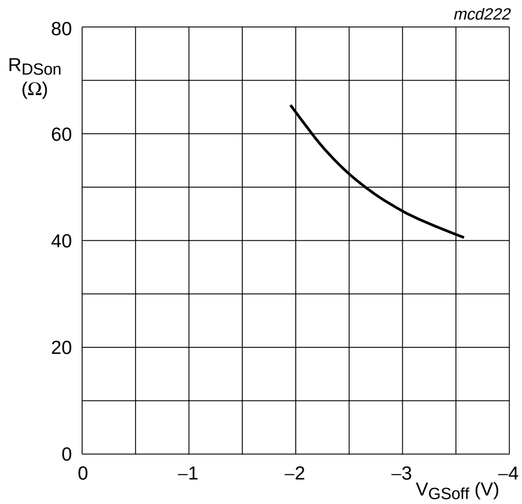
V_{DS} = 10 V; I_D = 10 mA; T_j = 25 °C.

Fig 3. Common source forward transfer admittance as a function of gate-source cut-off voltage; typical values.



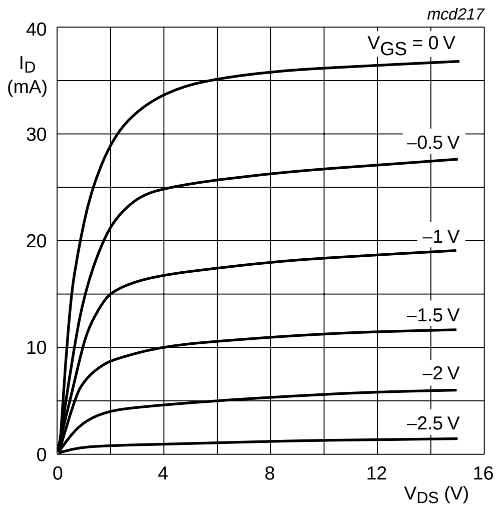
V_{DS} = 10 V; I_D = 10 mA; T_j = 25 °C.

Fig 4. Common-source output conductance as a function of gate-source cut-off voltage; typical values.



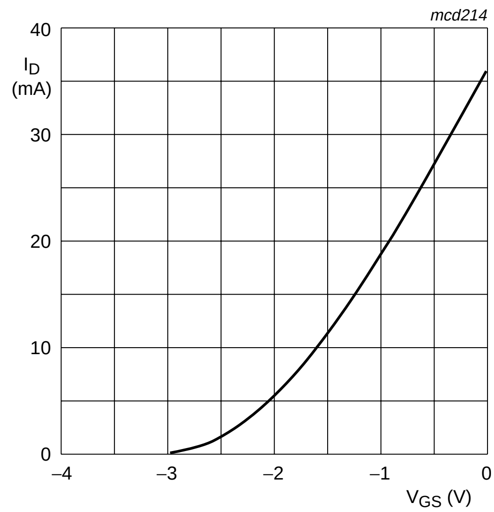
V_{DS} = 100 mV; V_{GS} = 0 V; T_j = 25 °C.

Fig 5. Drain-source on-state resistance as a function of gate-source cut-off voltage; typical values.



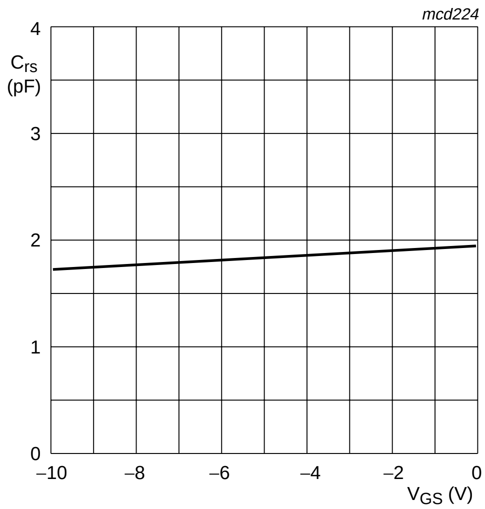
T_j = 25 °C.

Fig 6. Typical output characteristics.



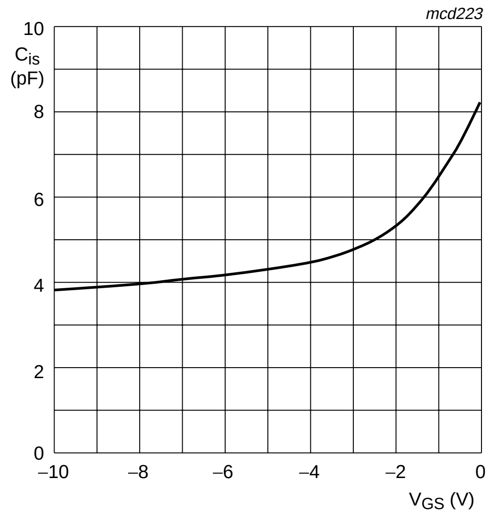
V_{DS} = 10 V; T_j = 25 °C.

Fig 7. Typical transfer characteristics.



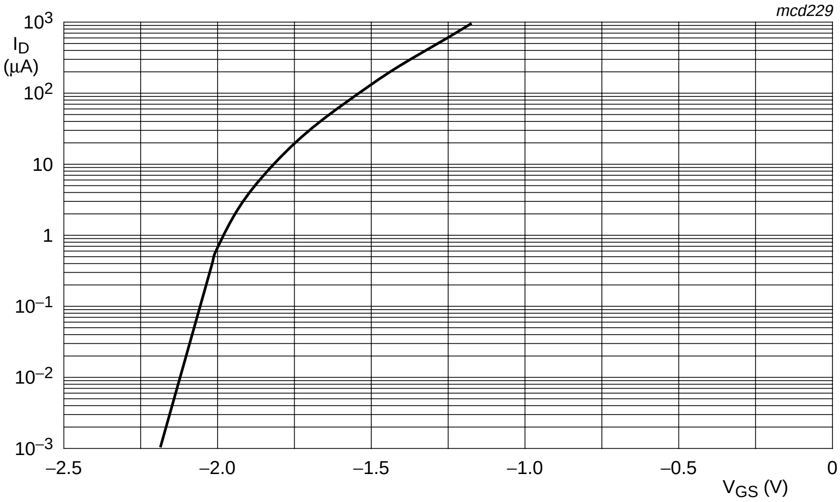
V_{DS} = 10 V; T_j = 25 °C.

Fig 8. Reverse transfer capacitance as a function of gate-source voltage; typical values.



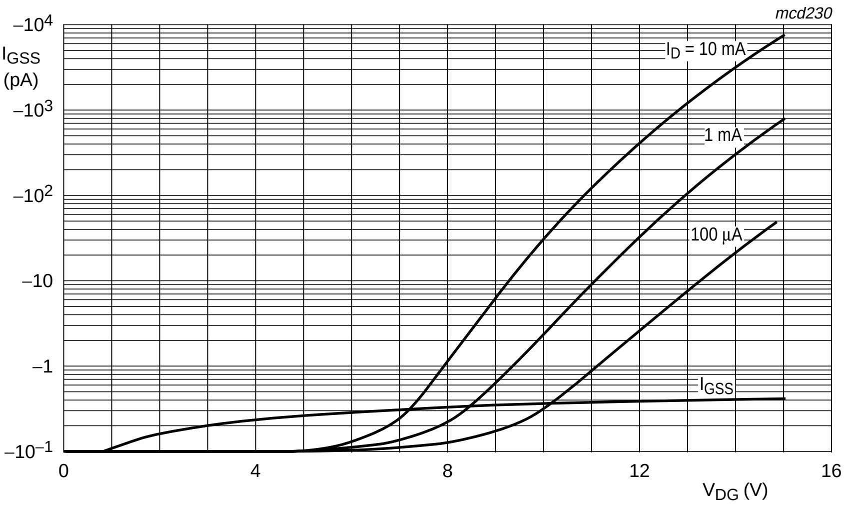
V_{DS} = 10 V; T_j = 25 °C.

Fig 9. Input capacitance as a function of gate-source voltage; typical values.



V_{DS} = 10 V; T_j = 25 °C.

Fig 10. Drain current as a function of gate-source voltage; typical values.



T_j = 25 °C.

Fig 11. Gate current as a function of drain-gate voltage; typical values.

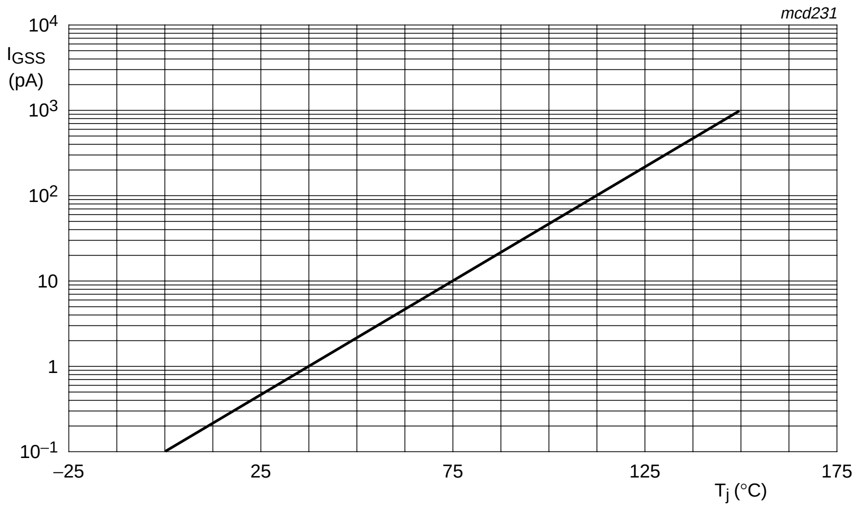
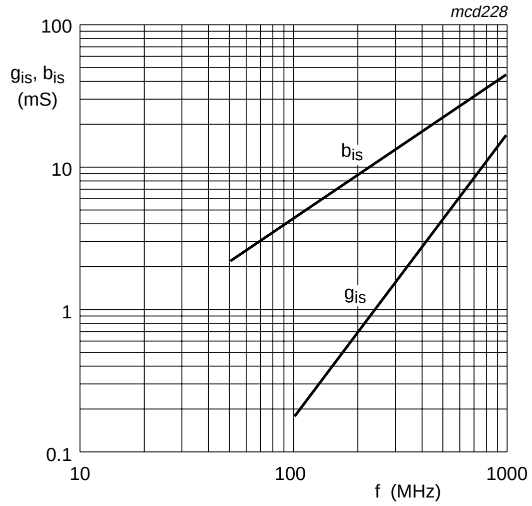
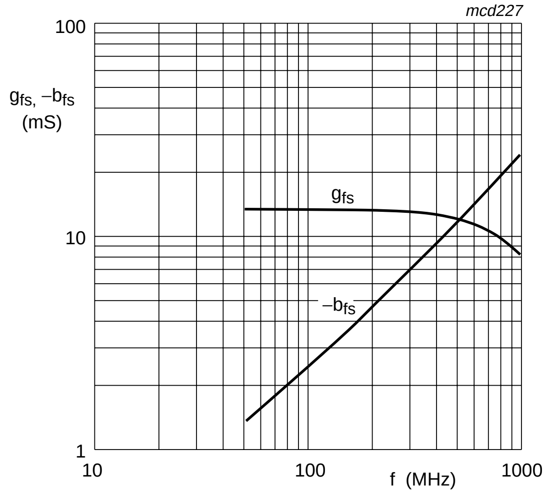


Fig 12. Gate current as a function of junction temperature; typical values.



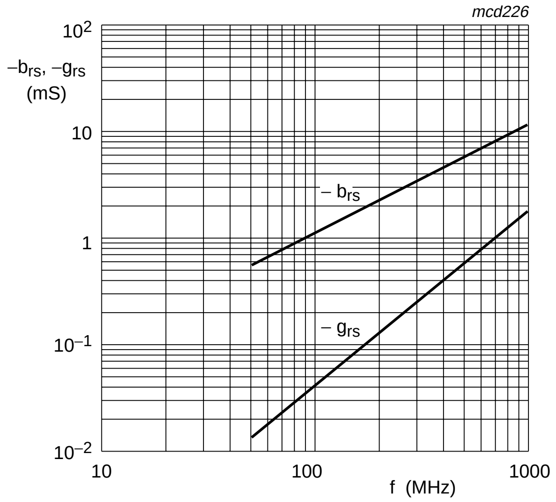
V_{DS} = 10 V; I_D = 10 mA; T_{amb} = 25 °C.

Fig 13. Input admittance as a function of frequency; typical values.



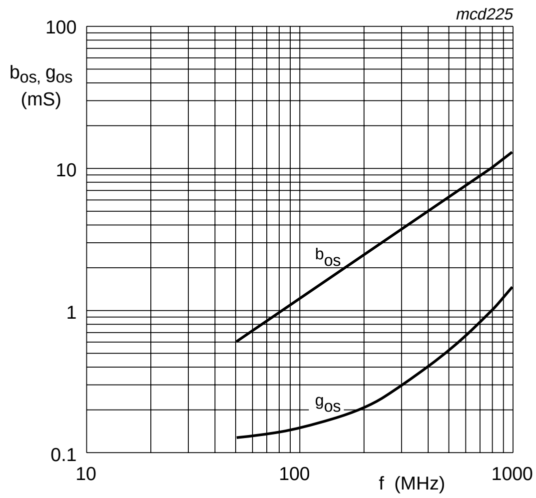
V_{DS} = 10 V; I_D = 10 mA; T_{amb} = 25 °C.

Fig 14. Forward transfer admittance as a function of frequency; typical values.



V_{DS} = 10 V; I_D = 10 mA; T_{amb} = 25 °C.

Fig 15. Reverse transfer admittance as a function of frequency; typical values.

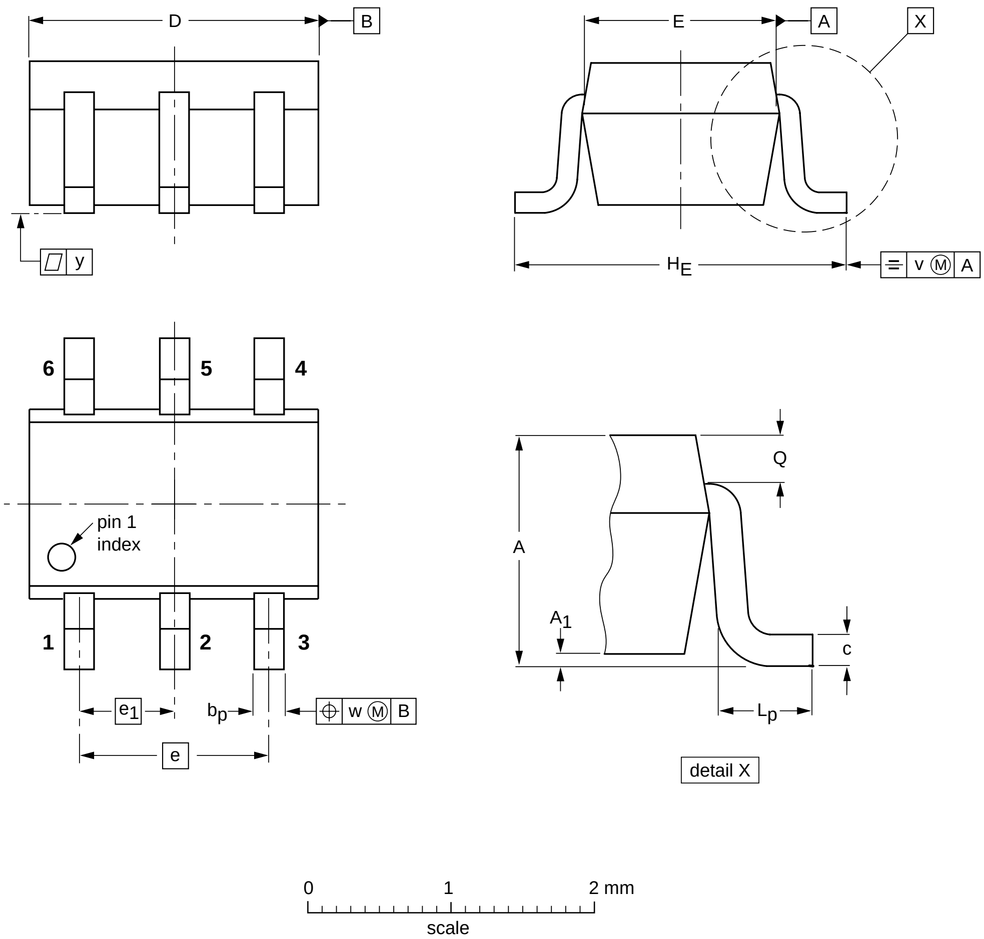


V_{DS} = 10 V; I_D = 10 mA; T_{amb} = 25 °C.

Fig 16. Output admittance as a function of frequency; typical values.

9. Package outline

Plastic surface mounted package; 6 leads **SOT363**



DIMENSIONS (mm are the original dimensions)

UNIT	A	A_1 max	b_p	c	D	E	e	e_1	H_E	L_p	Q	v	w	y
mm	1.1 0.8	0.1	0.30 0.20	0.25 0.10	2.2 1.8	1.35 1.15	1.3	0.65	2.2 2.0	0.45 0.15	0.25 0.15	0.2	0.2	0.1

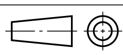
OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT363			SC-88			97-02-28

Fig 17. Package outline.

10. Revision history

Table 9: Revision history

Document ID	Release date	Data sheet status	Change notice	Order number	Supersedes
PMBFJ620_1	20040511	Product data	-	9397 750 13006	-

11. Data sheet status

Level	Data sheet status [1]	Product status [2] [3]	Definition
I	Objective data	Development	This data sheet contains data from the objective specification for product development. Philips Semiconductors reserves the right to change the specification in any manner without notice.
II	Preliminary data	Qualification	This data sheet contains data from the preliminary specification. Supplementary data will be published at a later date. Philips Semiconductors reserves the right to change the specification without notice, in order to improve the design and supply the best possible product.
III	Product data	Production	This data sheet contains data from the product specification. Philips Semiconductors reserves the right to make changes at any time in order to improve the design, manufacturing and supply. Relevant changes will be communicated via a Customer Product/Process Change Notification (CPCN).

[1] Please consult the most recently issued data sheet before initiating or completing a design.

[2] The product status of the device(s) described in this data sheet may have changed since this data sheet was published. The latest information is available on the Internet at URL http://www.semiconductors.philips.com.

[3] For data sheets describing multiple type numbers, the highest-level product status determines the data sheet status.

12. Definitions

Short-form specification — The data in a short-form specification is extracted from a full data sheet with the same type number and title. For detailed information see the relevant data sheet or data handbook.

Limiting values definition — Limiting values given are in accordance with the Absolute Maximum Rating System (IEC 60134). Stress above one or more of the limiting values may cause permanent damage to the device. These are stress ratings only and operation of the device at these or at any other conditions above those given in the Characteristics sections of the specification is not implied. Exposure to limiting values for extended periods may affect device reliability.

Application information — Applications that are described herein for any of these products are for illustrative purposes only. Philips Semiconductors make no representation or warranty that such applications will be suitable for the specified use without further testing or modification.

13. Disclaimers

Life support — These products are not designed for use in life support appliances, devices, or systems where malfunction of these products can reasonably be expected to result in personal injury. Philips Semiconductors customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Philips Semiconductors for any damages resulting from such application.

Right to make changes — Philips Semiconductors reserves the right to make changes in the products - including circuits, standard cells, and/or software - described or contained herein in order to improve design and/or performance. When the product is in full production (status ‘Production’), relevant changes will be communicated via a Customer Product/Process Change Notification (CPCN). Philips Semiconductors assumes no responsibility or liability for the use of any of these products, conveys no license or title under any patent, copyright, or mask work right to these products, and makes no representations or warranties that these products are free from patent, copyright, or mask work right infringement, unless otherwise specified.

14. Contact information

For additional information, please visit: **http://www.semiconductors.philips.com**

For sales office addresses, send an email to: **sales.addresses@www.semiconductors.philips.com**

15. Contents

1 Product profile 1
1.1 General description. 1
1.2 Features 1
1.3 Applications 1
1.4 Quick reference data. 1
2 Pinning information. 2
3 Ordering information. 2
4 Marking. 2
5 Limiting values. 3
6 Thermal characteristics. 3
7 Static characteristics. 4
8 Dynamic characteristics 4
9 Package outline 10
10 Revision history. 11
11 Data sheet status 12
12 Definitions 12
13 Disclaimers. 12
14 Contact information 12

Date of release: 11 May 2004
Document order number: 9397 750 13006

Published in The Netherlands