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PMBFJ620

Dual N-channel field-effect transistor

Rev. 3 — 6 March 2014

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). Observe precautions for handling electrostatic sensitive devices.

Such precautions are described in the *ANSI/ESD S20.20*, *IEC/ST 61340-5*, *JESD625-A* or equivalent standards.

1.2 Features and benefits

- 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	$V_{DS} = 10\text{ V}; I_D = 1\ \mu\text{A}$	-2	-	-6.5	V
I_{DSS}	drain current	$V_{GS} = 0\text{ V}; V_{DS} = 10\text{ V}$	24	-	60	mA
P_{tot}	total power dissipation	$T_s \leq 90\text{ °C}$	-	-	190	mW
$ y_{fs} $	forward transfer admittance	$V_{DS} = 10\text{ V}; I_D = 10\text{ mA}$	10	-	-	mS



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).

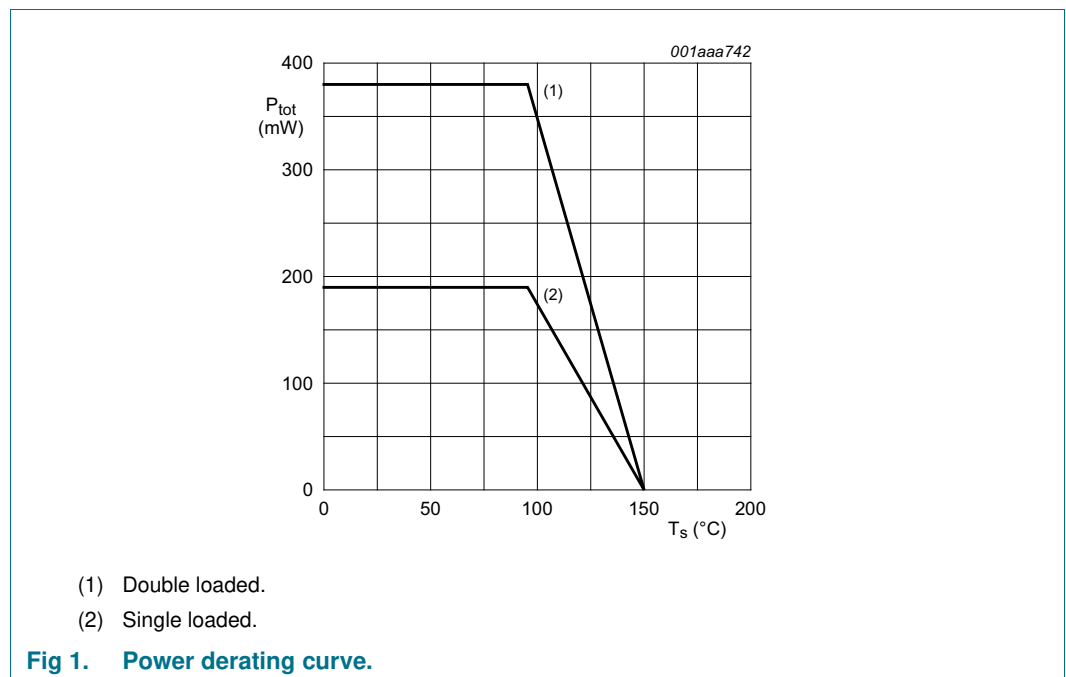
Symbol	Parameter	Conditions	Min	Max	Unit
Per FET					
V _{DS}	drain-source voltage		-	±25	V
V _{GSO}	gate-source voltage	open drain	-	-25	V
V _{GDO}	gate-drain voltage	open source	-	-25	V
I _G	forward gate current (DC)		-	50	mA
P _{tot}	total power dissipation	T _s ≤ 90 °C	-	190	mW
T _{stg}	storage temperature		-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](#).



7. Static characteristics

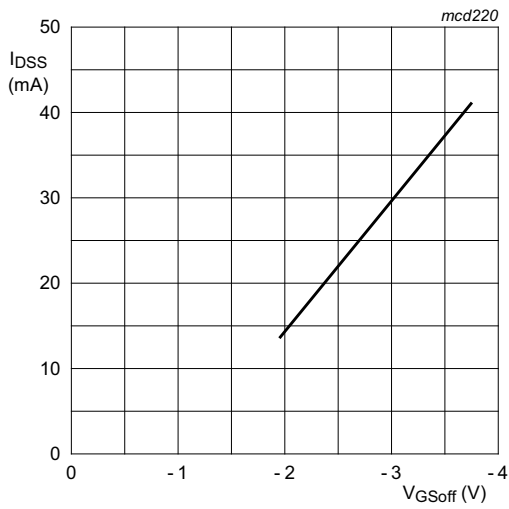
Table 7. Characteristics
 $T_j = 25\text{ }^\circ\text{C}$ unless otherwise specified.

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

8. Dynamic characteristics

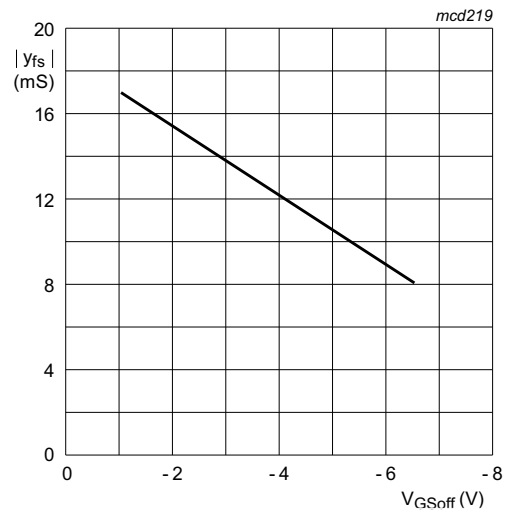
Table 8. Characteristics
 $T_j = 25\text{ }^\circ\text{C}$ unless otherwise specified.

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



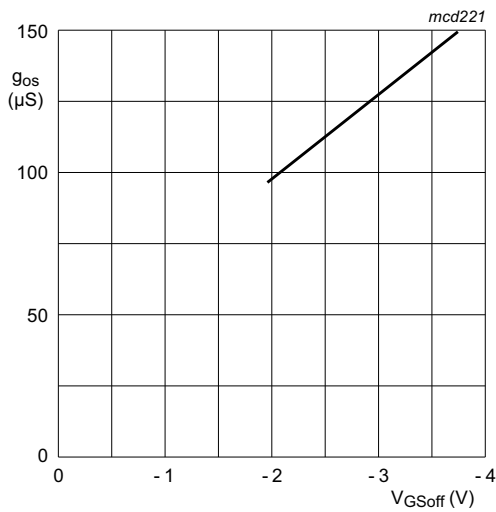
$V_{DS} = 10\text{ V}$; $T_j = 25\text{ }^\circ\text{C}$.

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



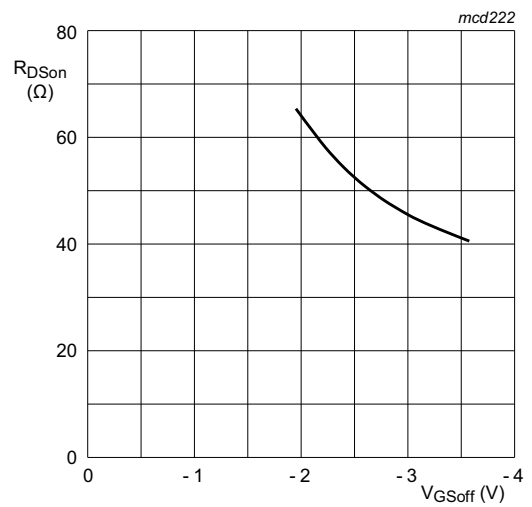
$V_{DS} = 10\text{ V}$; $I_D = 10\text{ mA}$; $T_j = 25\text{ }^\circ\text{C}$.

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



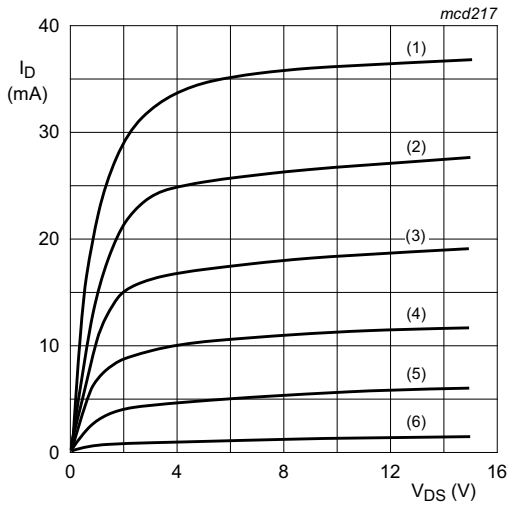
$V_{DS} = 10\text{ V}$; $I_D = 10\text{ mA}$; $T_j = 25\text{ }^\circ\text{C}$.

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



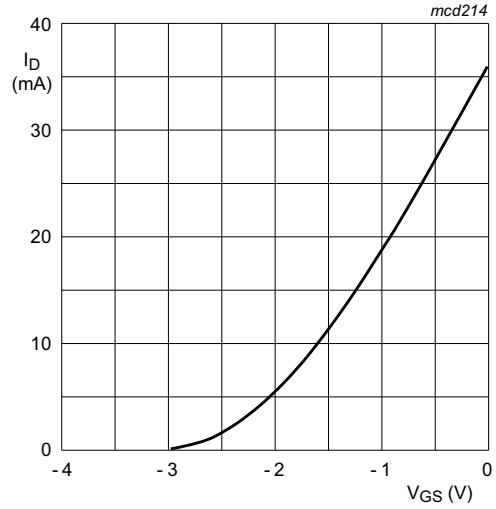
$V_{DS} = 100\text{ mV}$; $V_{GS} = 0\text{ V}$; $T_j = 25\text{ }^\circ\text{C}$.

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



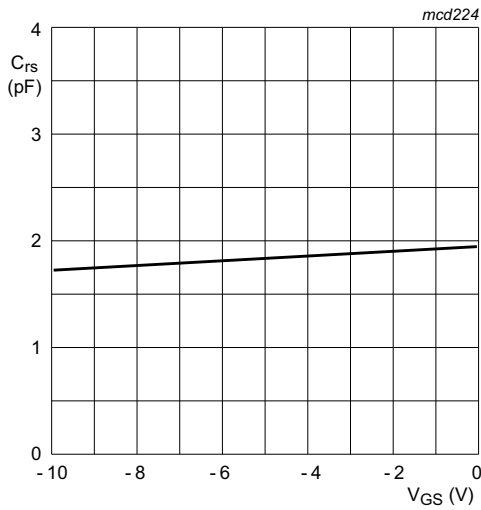
$T_j = 25\text{ }^\circ\text{C}$.
 (1) $V_{GS} = 0\text{ V}$
 (2) $V_{GS} = -0.5\text{ V}$
 (3) $V_{GS} = -1\text{ V}$
 (4) $V_{GS} = -1.5\text{ V}$
 (5) $V_{GS} = -2\text{ V}$
 (6) $V_{GS} = -2.5\text{ V}$

Fig 6. Typical output characteristics.



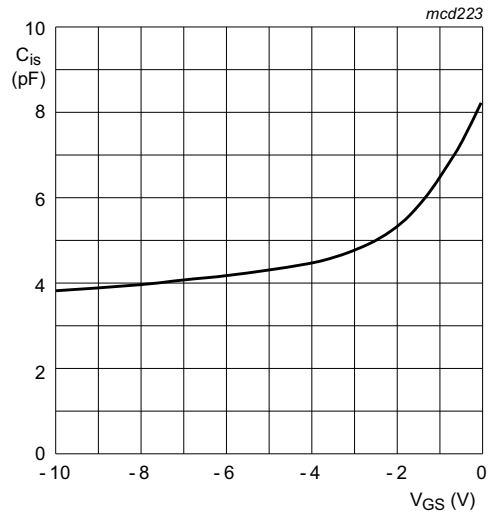
$V_{DS} = 10\text{ V}$; $T_j = 25\text{ }^\circ\text{C}$.

Fig 7. Typical transfer characteristics.



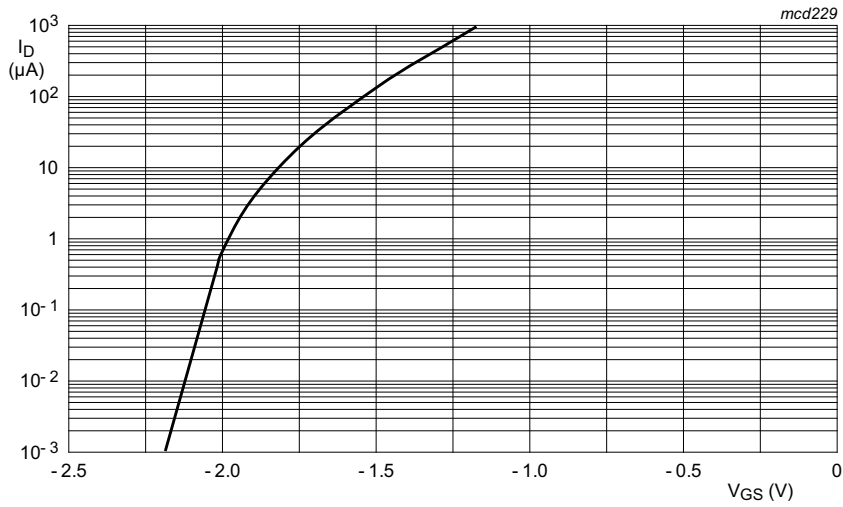
$V_{DS} = 10\text{ V}$; $T_j = 25\text{ }^\circ\text{C}$.

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



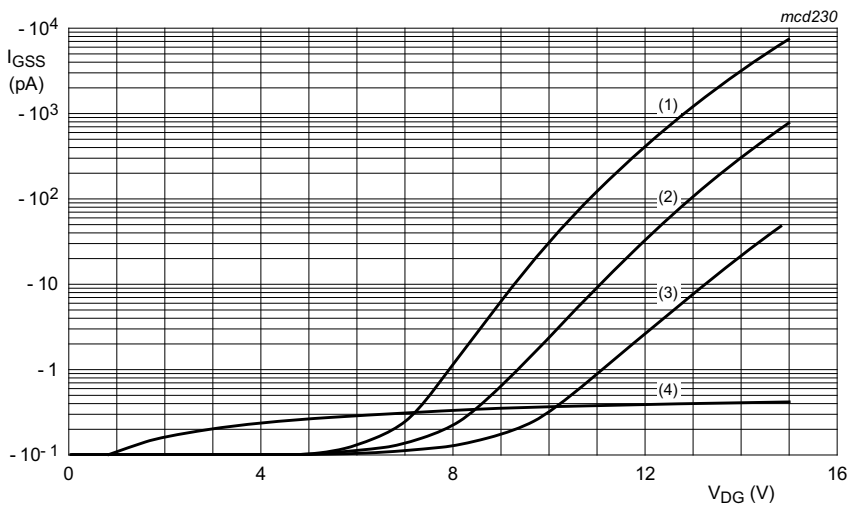
$V_{DS} = 10\text{ V}$; $T_j = 25\text{ }^\circ\text{C}$.

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



$V_{DS} = 10 \text{ V}; T_j = 25 \text{ }^\circ\text{C}.$

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



$T_j = 25 \text{ }^\circ\text{C}.$

- (1) $I_D = 10 \text{ mA}$
- (2) $I_D = 1 \text{ mA}$
- (3) $I_D = 100 \text{ } \mu\text{A}$
- (4) I_{GSS}

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

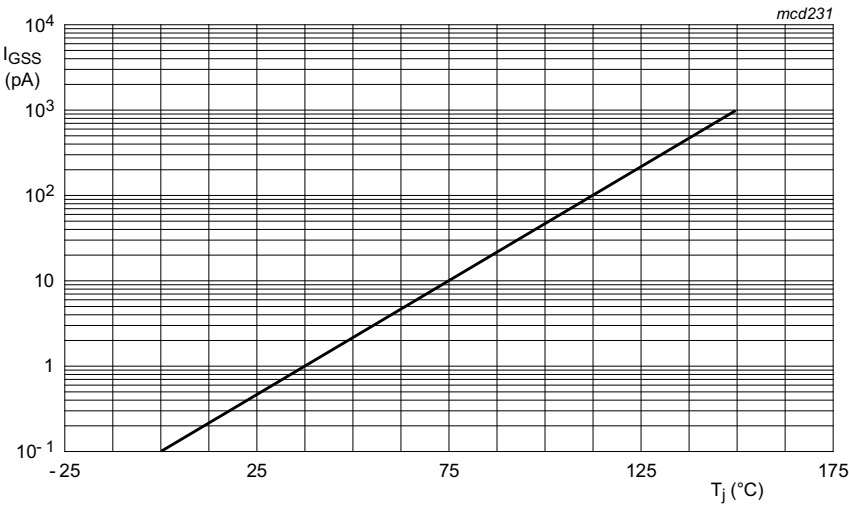
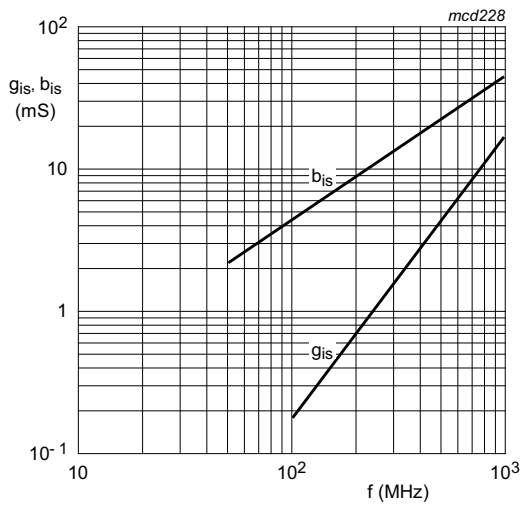
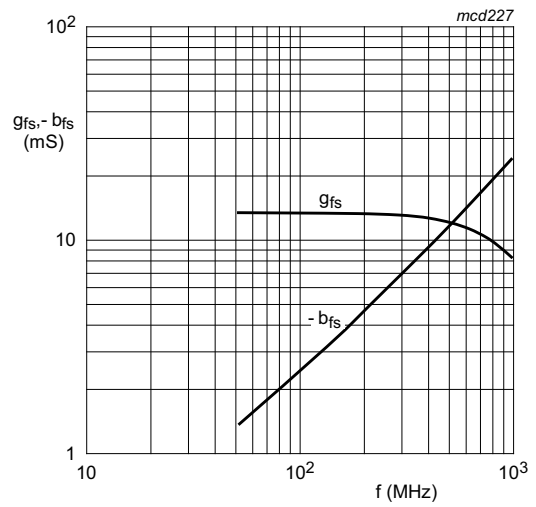


Fig 12. Gate current as a function of junction temperature; typical values.



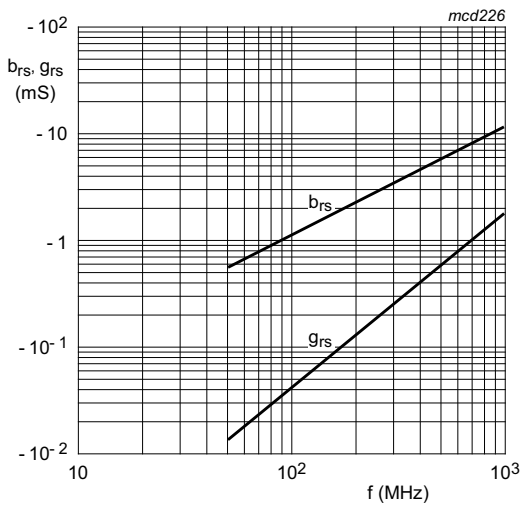
$V_{DS} = 10\text{ V}; I_D = 10\text{ mA}; T_{amb} = 25\text{ }^\circ\text{C}.$

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



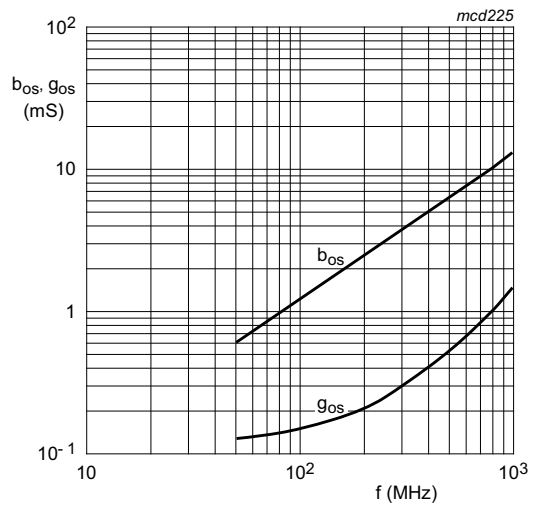
$V_{DS} = 10\text{ V}; I_D = 10\text{ mA}; T_{amb} = 25\text{ }^\circ\text{C}.$

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



$V_{DS} = 10\text{ V}; I_D = 10\text{ mA}; T_{amb} = 25\text{ }^\circ\text{C}.$

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



$V_{DS} = 10\text{ V}; I_D = 10\text{ mA}; T_{amb} = 25\text{ }^\circ\text{C}.$

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

9. Package outline

Plastic surface-mounted package; 6 leads

SOT363

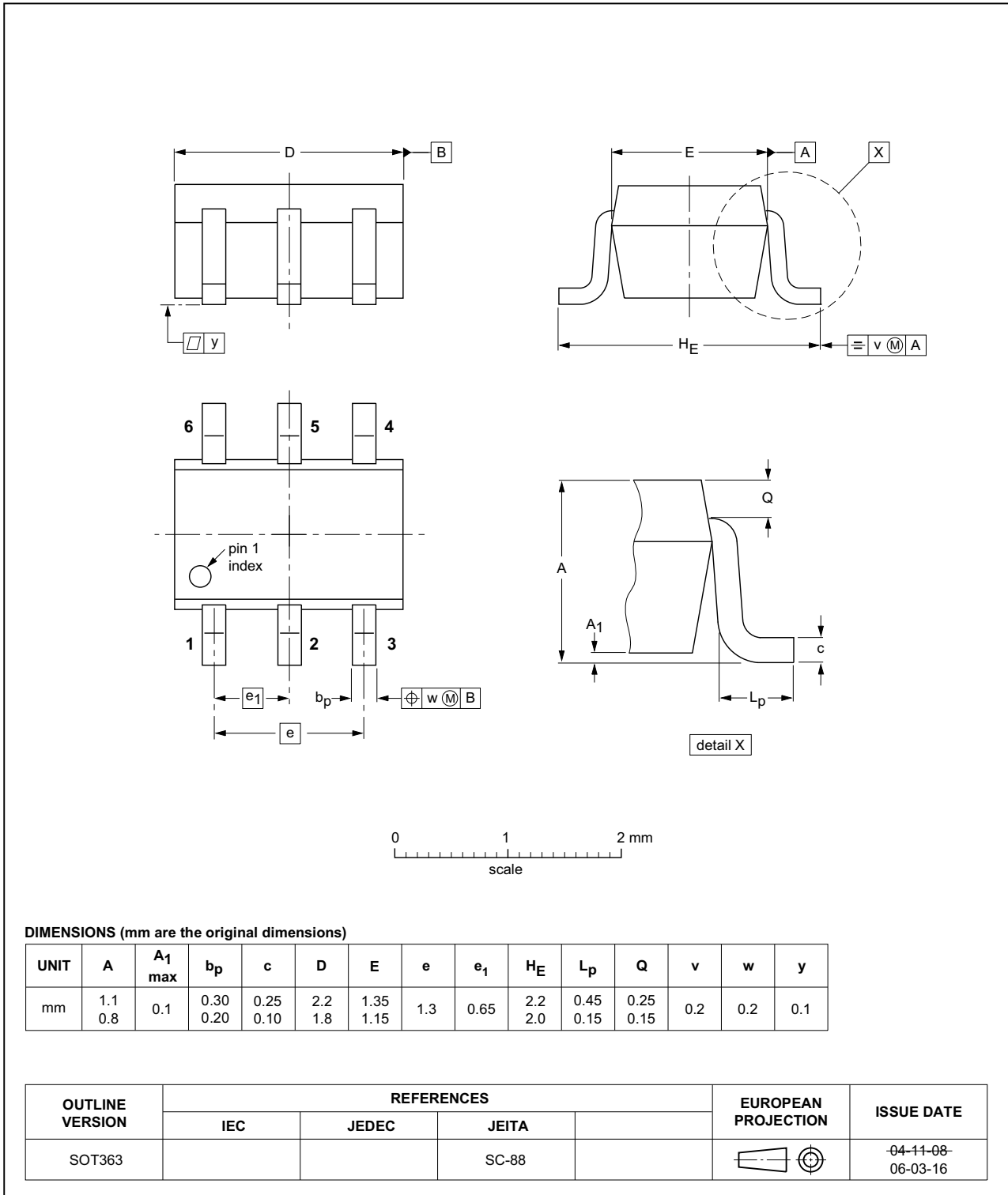


Fig 17. Package outline.

10. Revision history

Table 9. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
PMBFJ620 v.3	20140306	Product data sheet	-	PMBFJ620 v.2
Modifications:	<ul style="list-style-type: none">• Table 5 on page 3: correction parameter V_{GDO}• Figure 6 on page 6: figure notes list added• Figure 11 on page 7: figure notes list added			
PMBFJ620 v.2	20110915	Product data sheet	-	PMBFJ620 v.1
PMBFJ620 v.1 (9397 750 13006)	20040511	Product data sheet	-	-

11. Legal information

11.1 Data sheet status

Document status ^{[1][2]}	Product status ^[3]	Definition
Objective [short] data sheet	Development	This document contains data from the objective specification for product development.
Preliminary [short] data sheet	Qualification	This document contains data from the preliminary specification.
Product [short] data sheet	Production	This document contains the product specification.

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

[2] The term 'short data sheet' is explained in section "Definitions".

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13. Contents

1	Product profile	1
1.1	General description	1
1.2	Features and benefits	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	Legal information	12
11.1	Data sheet status	12
11.2	Definitions	12
11.3	Disclaimers	12
11.4	Trademarks	13
12	Contact information	13
13	Contents	14

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