



# 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
<b>Per FET</b>						
$V_{DS}$	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 <a href="#">[1]</a>
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).

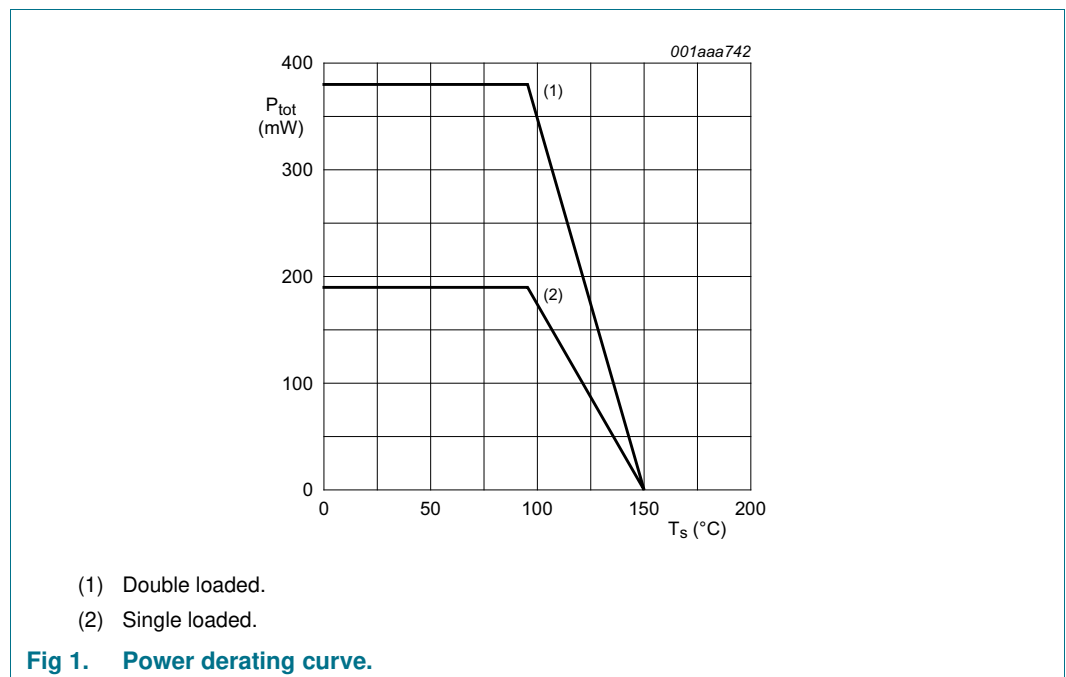
Symbol	Parameter	Conditions	Min	Max	Unit
<b>Per FET</b>					
$V_{DS}$	drain-source voltage		-	±25	V
$V_{GSO}$	gate-source voltage	open drain	-	-25	V
$V_{GDO}$	gate-drain voltage	open source	-	-25	V
$I_G$	forward gate current (DC)		-	50	mA
$P_{tot}$	total power dissipation	$T_s \leq 90\text{ °C}$	-	190	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

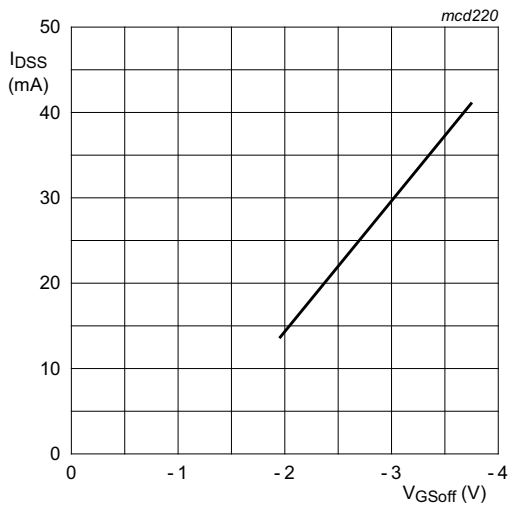
**Table 7. Characteristics**
 $T_j = 25\text{ }^\circ\text{C}$  unless otherwise specified.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Per FET</b>						
$V_{(BR)GSS}$	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	-	$\Omega$
$ 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	$\mu\text{S}$

## 8. Dynamic characteristics

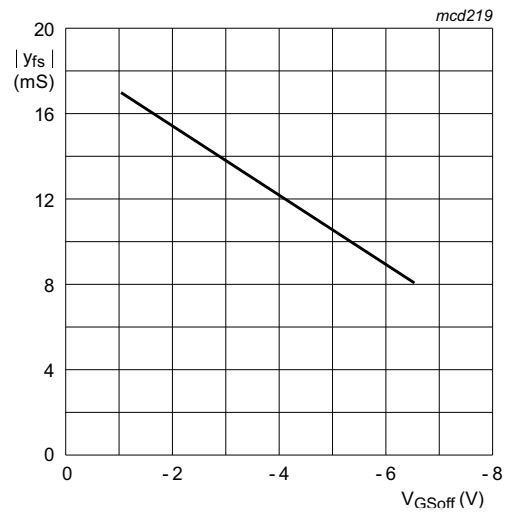
**Table 8. Characteristics**
 $T_j = 25\text{ }^\circ\text{C}$  unless otherwise specified.

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
<b>Per FET</b>						
$C_{iss}$	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	-	$\mu\text{S}$
		$V_{DS} = 10\text{ V}$ ; $I_D = 10\text{ mA}$ ; $f = 450\text{ MHz}$	-	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	-	$\mu\text{S}$
		$V_{DS} = 10\text{ V}$ ; $I_D = 10\text{ mA}$ ; $f = 450\text{ MHz}$	-	-450	-	$\mu\text{S}$
$g_{os}$	common source output conductance	$V_{DS} = 10\text{ V}$ ; $I_D = 10\text{ mA}$ ; $f = 100\text{ MHz}$	-	150	-	$\mu\text{S}$
		$V_{DS} = 10\text{ V}$ ; $I_D = 10\text{ mA}$ ; $f = 450\text{ MHz}$	-	400	-	$\mu\text{S}$
$V_n$	equivalent input noise voltage	$V_{DS} = 10\text{ V}$ ; $I_D = 10\text{ mA}$ ; $f = 100\text{ Hz}$	-	6	-	nV/ $\sqrt{\text{Hz}}$



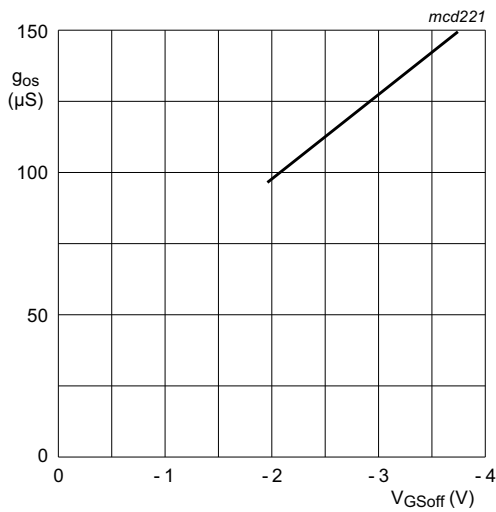
$V_{DS} = 10\text{ V}$ ;  $T_j = 25\text{ }^\circ\text{C}$ .

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



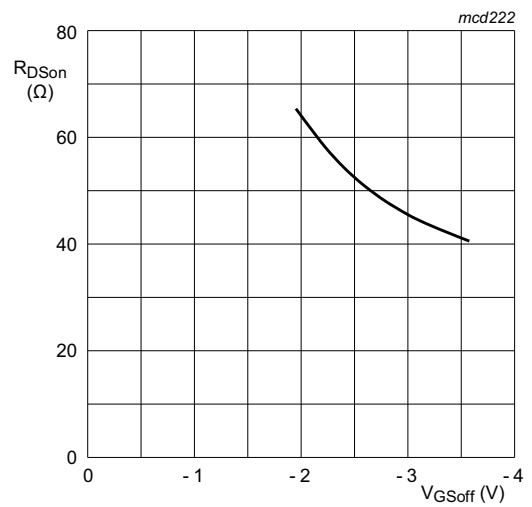
$V_{DS} = 10\text{ V}$ ;  $I_D = 10\text{ mA}$ ;  $T_j = 25\text{ }^\circ\text{C}$ .

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



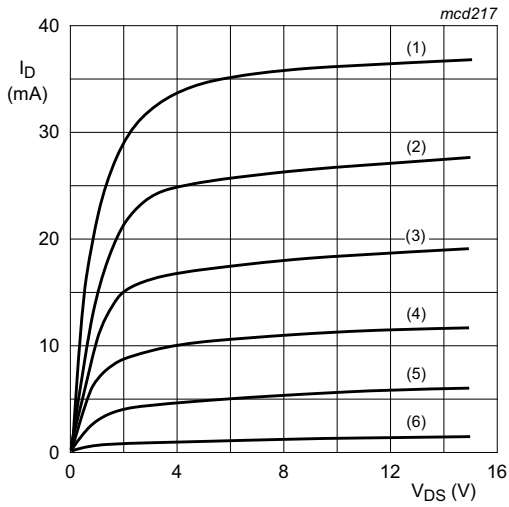
$V_{DS} = 10\text{ V}$ ;  $I_D = 10\text{ mA}$ ;  $T_j = 25\text{ }^\circ\text{C}$ .

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



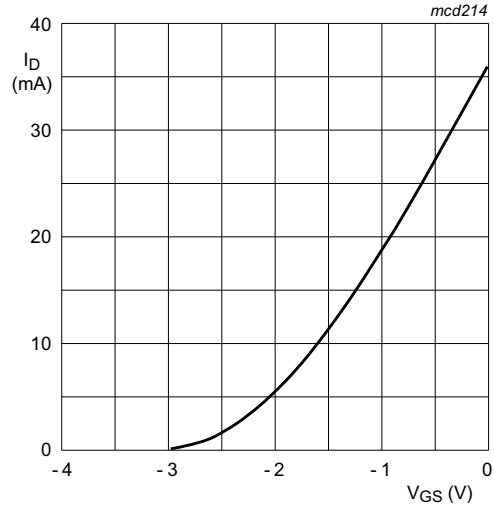
$V_{DS} = 100\text{ mV}$ ;  $V_{GS} = 0\text{ V}$ ;  $T_j = 25\text{ }^\circ\text{C}$ .

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



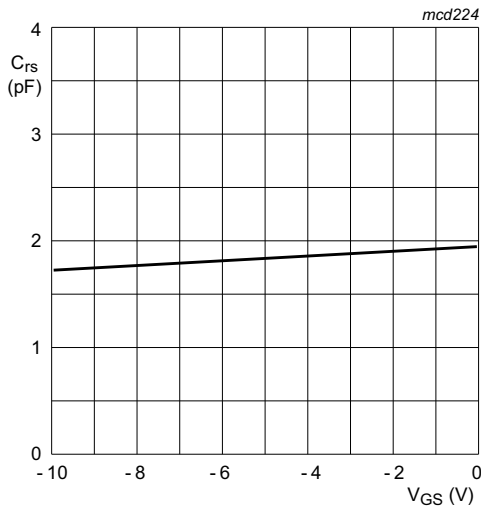
$T_j = 25\text{ }^\circ\text{C}$ .  
 (1)  $V_{GS} = 0\text{ V}$   
 (2)  $V_{GS} = -0.5\text{ V}$   
 (3)  $V_{GS} = -1\text{ V}$   
 (4)  $V_{GS} = -1.5\text{ V}$   
 (5)  $V_{GS} = -2\text{ V}$   
 (6)  $V_{GS} = -2.5\text{ V}$

**Fig 6. Typical output characteristics.**



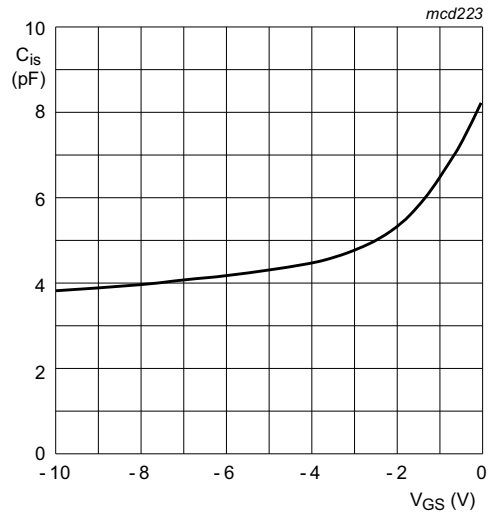
$V_{DS} = 10\text{ V}; T_j = 25\text{ }^\circ\text{C}$ .

**Fig 7. Typical transfer characteristics.**



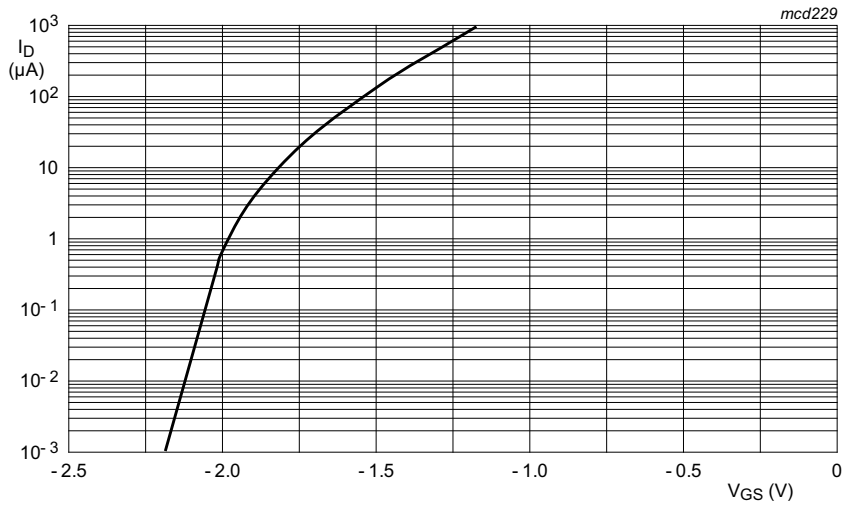
$V_{DS} = 10\text{ V}; T_j = 25\text{ }^\circ\text{C}$ .

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



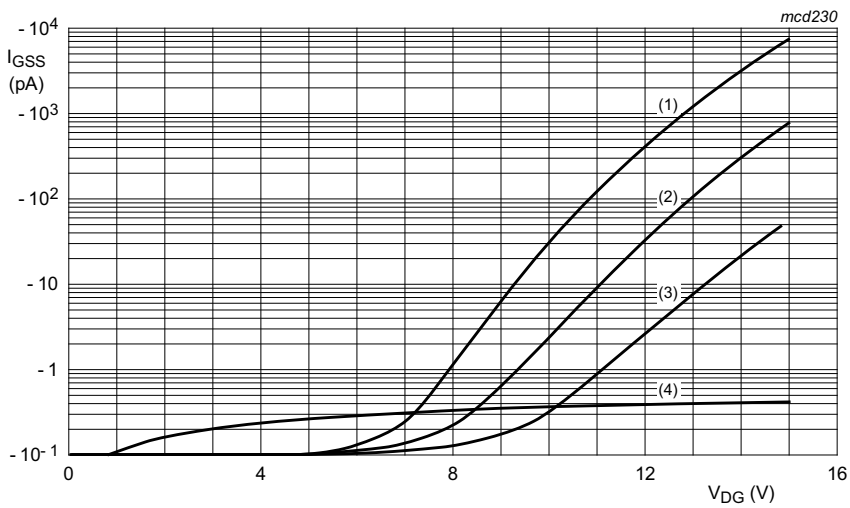
$V_{DS} = 10\text{ V}; T_j = 25\text{ }^\circ\text{C}$ .

**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.**

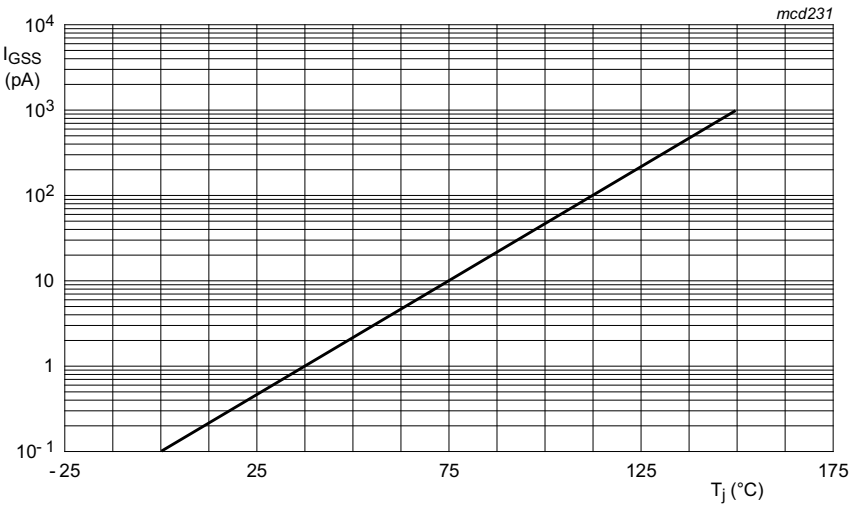
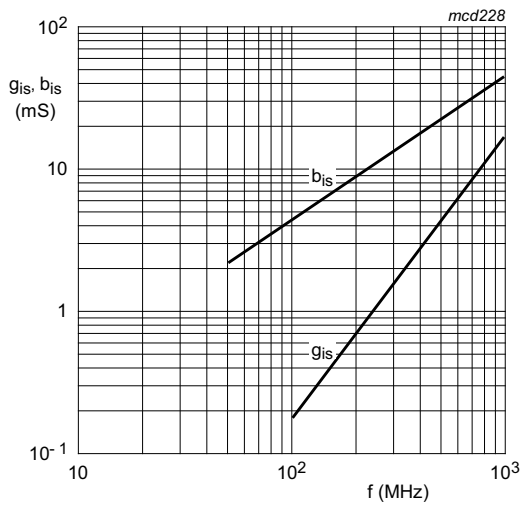


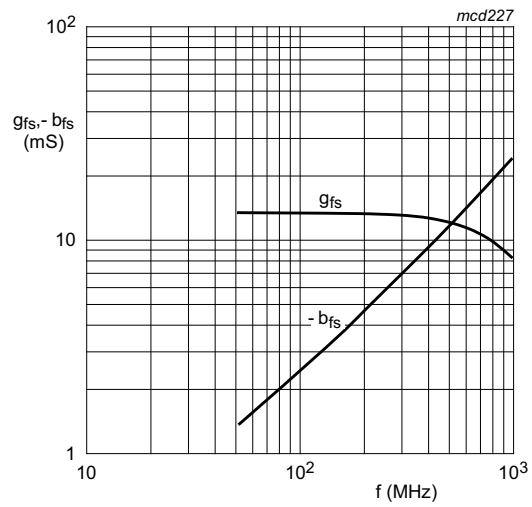
Fig 12. Gate current as a function of junction temperature; typical values.





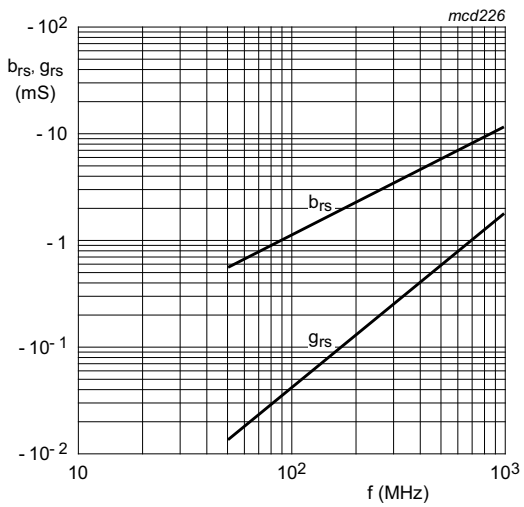
$V_{DS} = 10\text{ V}; I_D = 10\text{ mA}; T_{amb} = 25\text{ }^\circ\text{C}.$

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



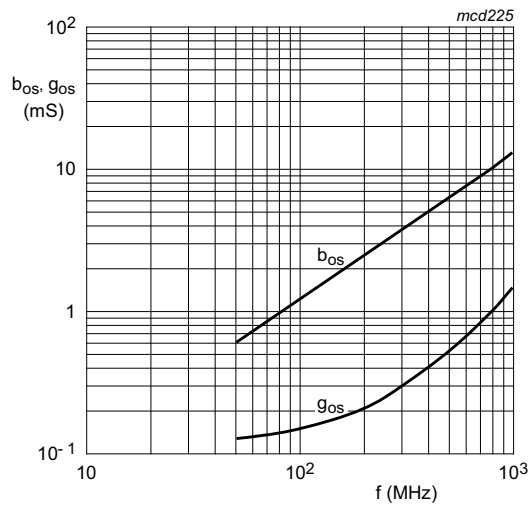
$V_{DS} = 10\text{ V}; I_D = 10\text{ mA}; T_{amb} = 25\text{ }^\circ\text{C}.$

**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

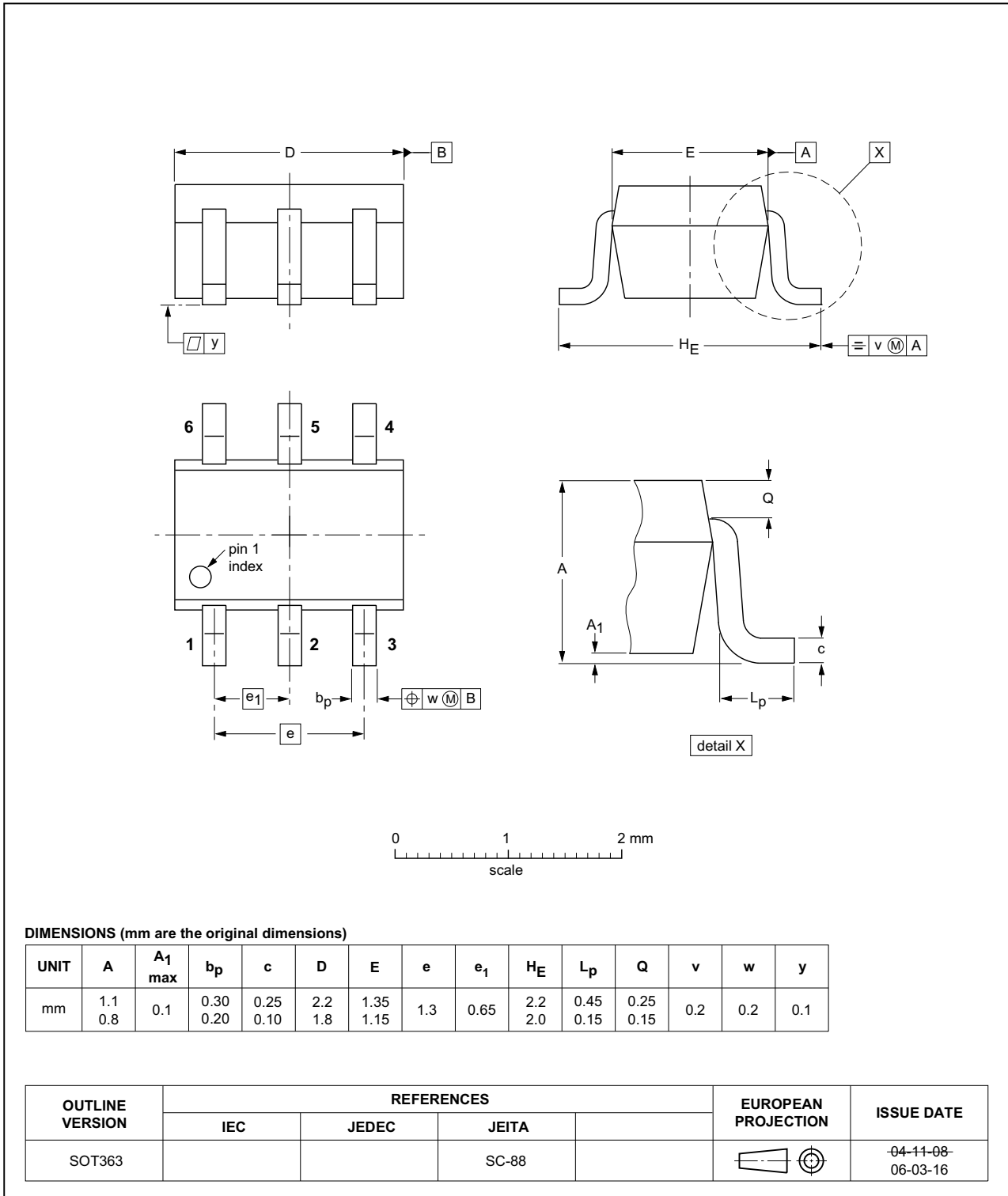


Fig 17. Package outline.

## 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"><li>• <a href="#">Table 5 on page 3</a>: correction parameter <math>V_{GDO}</math></li><li>• <a href="#">Figure 6 on page 6</a>: figure notes list added</li><li>• <a href="#">Figure 11 on page 7</a>: figure notes list added</li></ul>			
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 <sup>[1][2]</sup>	Product status <sup>[3]</sup>	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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