

MS23P21

P-Channel 20-V (D-S) MOSFET

Description

These miniature surface mount MOSFETs utilize a high cell density trench process to provide low $R_{DS(on)}$ and to ensure minimal power loss and heat dissipation.

Typical applications are DC-DC converters and power management in portable and battery-powered products such as computers, printers, PCMCIA cards, cellular and cordless telephones.

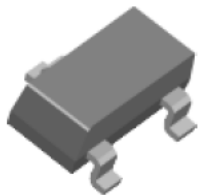
Features

- Low $r_{DS(on)}$ provides higher efficiency and extends battery life
- Low thermal impedance copper lead frame SOT-23 saves board space
- Fast switching speed
- High performance trench technology
- RoHS compliant package

Package type : SOT-23

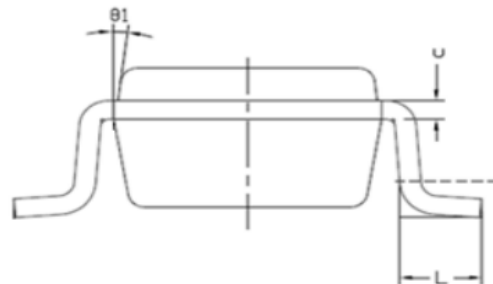
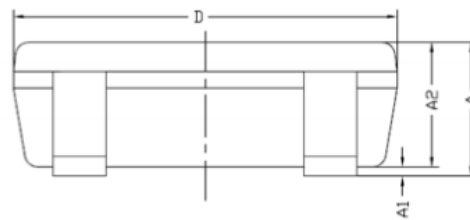
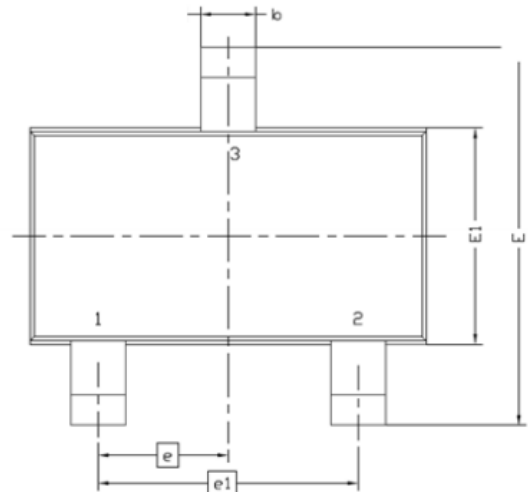
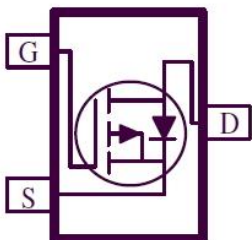
Packing & Order Information

3,000/Reel



**RoHS
COMPLIANT**

Graphic symbol



Symbol	MILLIMETERS	
	MIN	MAX
A	0.8	1.2
A1	0	0.1
A2	0.7	1.1
b	0.3	0.5
c	0.1	0.2
D	2.7	3.1
E	2.6	3
E1	1.4	1.8
e	0.95 BSC	
e1	1.9 BSC	
L	0.3	0.6
θ1	7° NOM	

MS23P21

P-Channel 20-V (D-S) MOSFET

MAXIMUM RATINGS AND ELECTRICAL CHARACTERISTICS

Absolute Maximum Ratings (Tc=25°C unless otherwise specified)

Symbol	Parameter	Value	Unit
V _{DS}	Drain-Source Voltage	-20	V
V _{GS}	Gate-Source Voltage	±8	V
I _D	Continuous Drain Current ^a (T _A =25°C)	-4.1	A
I _{DM}	Pulsed Drain Current ^b	-10	A
I _S	Continuous Source Current (Diode Conduction) ^a	0.46	A
T _J , T _{STG}	Operating Junction and Storage Temperature	-55 to +150	°C
P _d	Power Dissipation@ TC=25°C	1.25	W

NOTE:

1. Repetitive rating; pulse width limited by maximum junction temperature.

Thermal Characteristics (Tc=25°C unless otherwise specified)

Parameter	Symbol	Value	Units
Maximum Junction-to-Case	R _{θJC}	150	°C/W
Maximum Junction-to-Ambient	R _{θJA}	100	

Static

Symbol	Parameter	Test Conditions	Min	Typ.	Max.	Units
V _{GS(th)}	Gate-Threshold Voltage	V _{DS} = V _{GS} , I _D = -250μA	-0.4		-1.5	V
I _{GSS}	Gate-Body Leakage	V _{DS} = 0 V, V _{GS} = ±8 V			±100	nA
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} = -16 V, V _{GS} = 0 V V _{DS} = -16 V, V _{GS} = 0 V, T _J = 55°C			-1 -10	uA
I _{D(on)}	On-State Drain Current ^A	V _{DS} = -5 V, V _{GS} = -4.5 V	-5			A
r _{DS(on)}	Drain-Source On-Resistance ^A	V _{DS} = -4.5 V, I _D = -4.1 A V _{DS} = -2.5 V, I _D = -3.2 A			79 110	mΩ
g _{fs}	Forward Transconductance ^A	V _{DS} = -5 V, V _{GS} = -1.25 V		9		S
V _{SD}	Diode Forward Voltage	I _S = -0.46 V, I _D = 0 V		-0.65		V
I _{SM}	Pulsed Body-Diode Current ^C				-10	A

MS23P21

P-Channel 20-V (D-S) MOSFET

Dynamic ^b						
Symbol	Parameter	Test Conditions	Min	Typ.	Max.	Units
Q_g	Total Gate Charge	$V_{DS} = -10\text{ V}$, $I_D = -4.1\text{ A}$, $V_{GS} = -4.5\text{ V}$	--	7.2	--	nC
Q_{gs}	Gate-Source Charge		--	1.7	--	nC
Q_{gd}	Gate-Drain Charge		--	1.5	--	nC
$t_{d(on)}$	Turn-On Delay Time	$V_{DD} = -10\text{ V}$, $I_L = -1\text{ A}$, $V_{GEN} = -4.5\text{ V}$, $R_G = 6\ \Omega$	--	10	--	ns
t_r	Rise Time		--	9	--	ns
$t_{d(off)}$	Turn-Off Delay Time		--	27	--	ns
t_f	Fall Time		--	11	--	ns
C_{ISS}	Input Capacitance	P-Channel $V_{DS} = -15\text{ V}$ $I_D = -3.7\text{ A}$, $V_{GS} = 0\text{ V}$	--	500	--	nC
C_{OSS}	Output Capacitance		--	90	--	nC
C_{RSS}	Reverse Transfer Capacitance		--	60	--	nC

Notes :

- Pulse test: $PW \leq 300\mu s$ duty cycle $\leq 2\%$.
- Guaranteed by design, not subject to production testing.
- Repetitive rating, pulse width limited by junction temperature.

MS 23P21

P-Channel 20-V (D-S) MOSFET

Disclaimer

ALL PRODUCT, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE

WITHOUT NOTICE TO IMPROVE RELIABILITY, FUNCTION OR DESIGN OR OTHERWISE.

Bruckewell Technology Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Bruckewell"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained in any datasheet or in any other disclosure relating to any product.

Bruckewell makes no warranty, representation or guarantee regarding the suitability of the products for any particular purpose or the continuing production of any product. To the maximum extent permitted by applicable law, Bruckewell disclaims

- (i) Any and all liability arising out of the application or use of any product.
- (ii) Any and all liability, including without limitation special, consequential or incidental damages.
- (iii) Any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.

Statements regarding the suitability of products for certain types of applications are based on Bruckewell's knowledge of typical requirements that are often placed on Bruckewell products in generic applications.

Such statements are not binding statements about the suitability of products for a particular application. It is the customer's responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. Parameters provided in datasheets and/or specifications may vary in different applications and performance may vary over time.

Product specifications do not expand or otherwise modify Bruckewell's terms and conditions of purchase, including but not limited to the warranty expressed therein.