

## BC3401 P-Channel 30-V(D-S) MOSFET

# SOT-23 P-Channel Enhancement Mode Field Effect Transistor

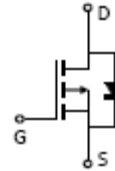
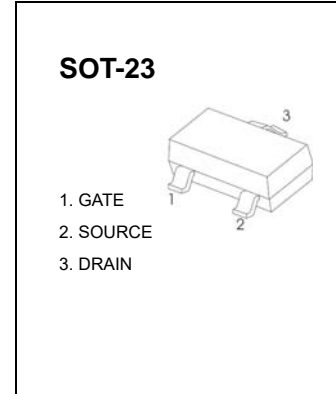
### FEATURE

V<sub>DS</sub> (V) = -30V  
 I<sub>D</sub> = -4.2 A (V<sub>GS</sub> = -10V)

### APPLICATIONS

- Load Switch for Portable Devices
- DC/DC Converter

**MARKING: 3401**



### Maximum ratings (T<sub>a</sub>=25°C unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V <sub>DS</sub>	-30	V
Gate-Source Voltage	V <sub>GS</sub>	±12	
Continuous Drain Current	I <sub>D</sub>	-4.2	A
Pulsed Drain Current	I <sub>DM</sub>	-30	
Continuous Source-Drain Diode Current	I <sub>S</sub>	-0.72	
Maximum Power Dissipation	P <sub>D</sub>	1.40	W
Thermal Resistance from Junction to Ambient(t ≤10s)	R <sub>θJA</sub>	90	°C/W
Junction Temperature	T <sub>J</sub>	150	°C
Storage Temperature	T <sub>stg</sub>	-55 ~+150	

# BC3401

## Electrical characteristics (T<sub>a</sub>=25°C unless otherwise noted)

Parameter	Symbol	Test Condition	Min	Typ	Max	Units
<b>Static</b>						
Drain-source breakdown voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> = -250μA	-30			V
Gate-source threshold voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250μA	-0.7	-1	-1.3	
Gate-source leakage	I <sub>GSS</sub>	V <sub>DS</sub> = 0V, V <sub>GS</sub> = ±12V			±100	nA
Zero gate voltage drain current	I <sub>DSS</sub>	V <sub>DS</sub> = -24V, V <sub>GS</sub> = 0V			-1	μA
Drain-source on-state resistance <sup>a</sup>	R <sub>DS(on)</sub>	V <sub>GS</sub> = -10V, I <sub>D</sub> = -4.2A		42	50	mΩ
		V <sub>GS</sub> = -2.5V, I <sub>D</sub> = -1.0A		80	120	
Forward transconductance <sup>a</sup>	g <sub>fs</sub>	V <sub>DS</sub> = -5V, I <sub>D</sub> = -5A	7	11		S
<b>Dynamic<sup>b</sup></b>						
Input capacitance	C <sub>iSS</sub>	V <sub>DS</sub> = -15V, V <sub>GS</sub> = 0V, f = 1MHz		954		pF
Output capacitance	C <sub>oSS</sub>			115		
Reverse transfer capacitance	C <sub>rSS</sub>			77		
Total gate charge	Q <sub>g</sub>	V <sub>DS</sub> = -15V, V <sub>GS</sub> = -4.5V, I <sub>D</sub> = -4A		9.4		nC
Gate-source charge	Q <sub>gs</sub>			2		
Gate-drain charge	Q <sub>gd</sub>			3		
Gate resistance	R <sub>g</sub>	V <sub>DS</sub> = 0V, V <sub>GS</sub> = 0V, f = 1MHz		6.0		Ω
Turn-on delay time	t <sub>d(on)</sub>	V <sub>GS</sub> = -10V, V <sub>DS</sub> = -15V, R <sub>L</sub> = 3.6Ω, R <sub>GEN</sub> = 6Ω		6.3		ns
Rise time	t <sub>r</sub>			3.2		
Turn-off delay time	t <sub>d(off)</sub>			38.2		
Fall time	t <sub>f</sub>			12		
<b>Drain-source body diode characteristics</b>						
Continuous source-drain diode current	I <sub>S</sub>	T <sub>C</sub> = 25°C			-2.2	A
Body diode voltage	V <sub>SD</sub>	I <sub>S</sub> = -0.7A		-0.75	-1	V

### Notes :

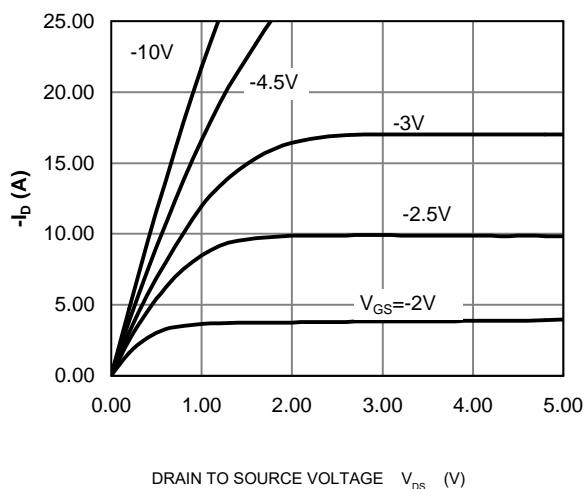
a. Pulse Test : Pulse Width < 300μs, Duty Cycle ≤ 2%.

b. Guaranteed by design, not subject to production testing.

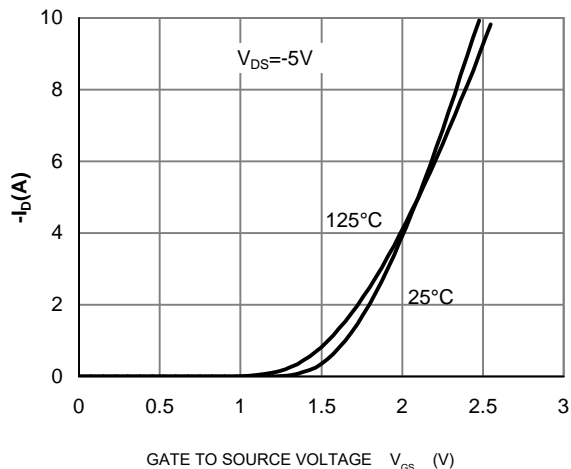
# Typical Characteristics

## BC3401

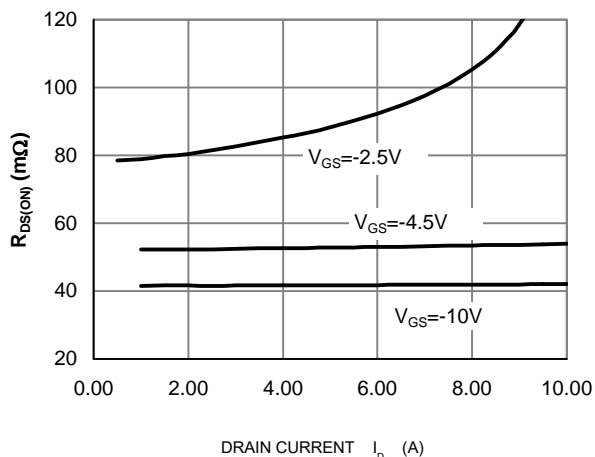
Output Characteristics



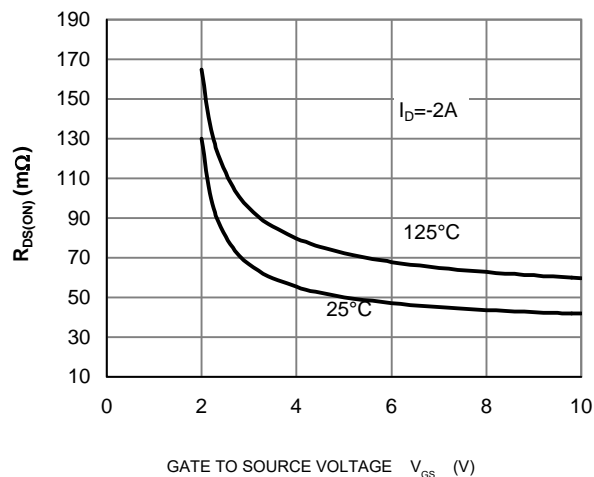
Transfer Characteristics



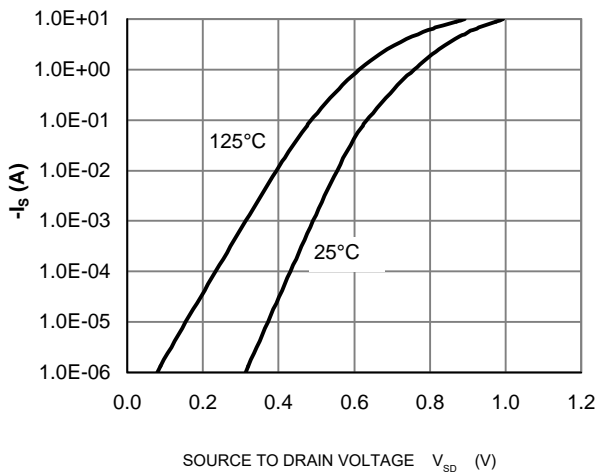
$R_{DS(ON)}$  —  $I_D$



$R_{DS(ON)}$  —  $V_{GS}$



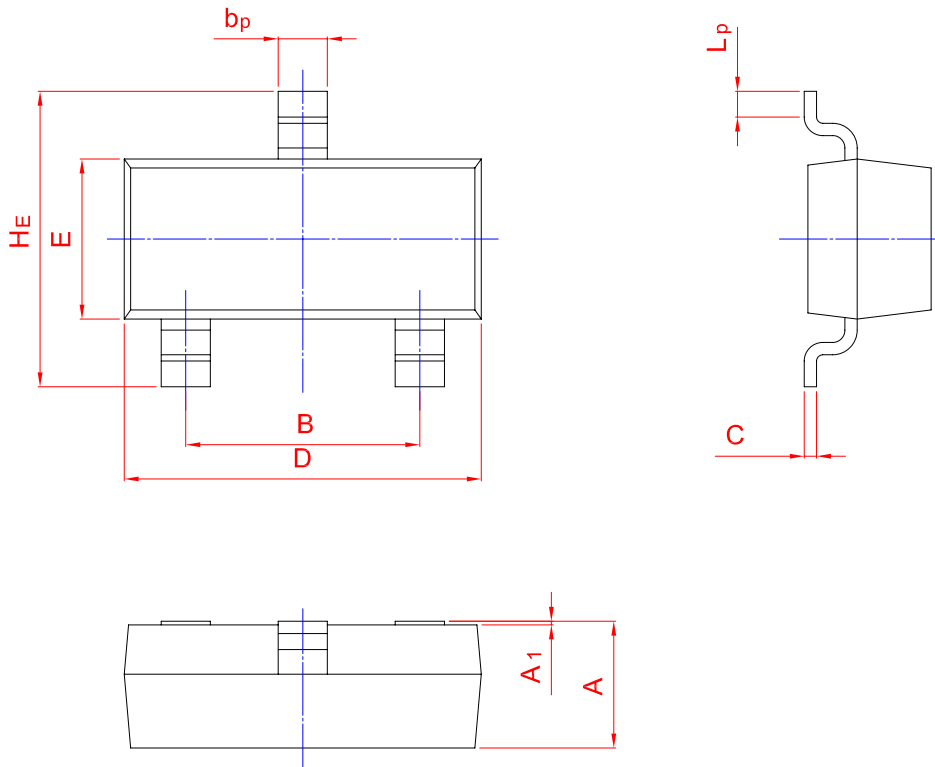
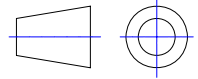
$I_S$  —  $V_{SD}$



## PACKAGE OUTLINE

Plastic surface mounted package; 3 leads

SOT-23



UNIT	A	B	b <sub>p</sub>	C	D	E	H <sub>E</sub>	A <sub>1</sub>	L <sub>p</sub>
mm	1.40	2.04	0.50	0.19	3.10	1.65	3.00	0.100	0.50
	0.95	1.78	0.35	0.08	2.70	1.20	2.20	0.013	0.20