

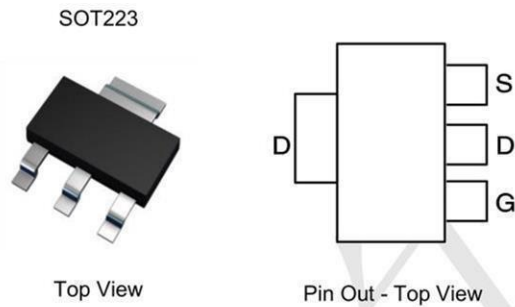
## Product Summary

- -60V/-3A  
 $R_{DS(ON)} = 95m\Omega$  (Typ) @  $V_{GS} = -10V$   
 $R_{DS(ON)} = 130m\Omega$  (Typ) @  $V_{GS} = -4.5V$
- Reliable and Rugged
- Lead Free and Green Devices Available (RoHS Compliant)

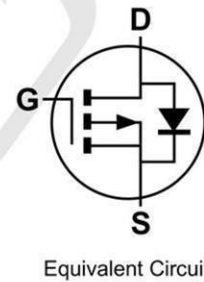
## Application

- DC-DC Converters.
- Load Switch.
- Power Management.

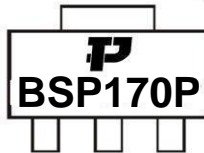
## Package and Pin Configuration



## Circuit diagram



Marking:



## Absolute Maximum Ratings ( $T_A = 25^\circ C$ unless otherwise noted)

| Characteristic                         |                |                              | Symbol    | Value    | Unit  |   |
|--|----------------|------------------------------|-----------|----------|-------|---|
| Drain-Source Voltage                   |                |                              | $V_{DSS}$ | -60      | V     |   |
| Gate-Source Voltage                    |                |                              | $V_{GSS}$ | $\pm 20$ | V     |   |
| Continuous Drain Current               | $V_{GS} = 10V$ | (Note 6)                     | $I_D$     | -4.3     | A     |   |
|  |                | $T_A = +70^\circ C$ (Note 6) |           | -3.0     |       |   |
|  |                | (Note 5)                     |           | -3.0     |       |   |
| Pulsed Drain Current                   | $V_{GS} = 10V$ | (Note 7)                     | $I_{DM}$  | -13.7    | A     |   |
| Continuous Source Current (Body Diode) |                |                              | (Note 6)  | $I_S$    | -4.8  | A |
| Pulsed Source Current (Body Diode)     |                |                              | (Note 7)  | $I_{SM}$ | -13.7 | A |

## Thermal Characteristics (@ $T_A = +25^\circ C$ , unless otherwise specified.)

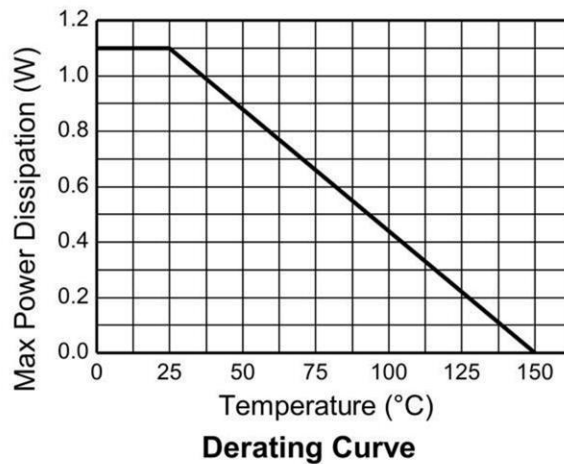
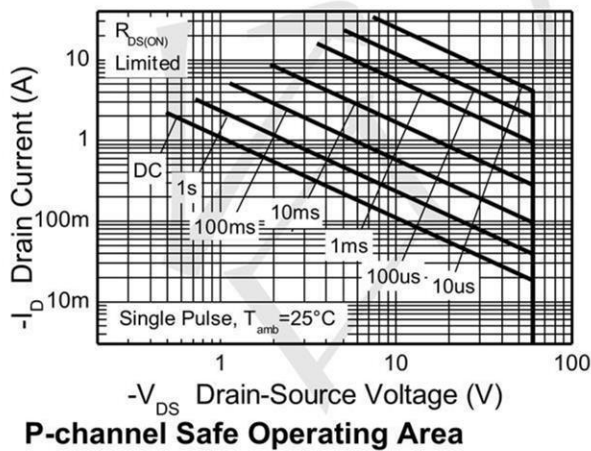
| Characteristic                          |          | Symbol          | Value          | Unit           |            |
|---|----------|-----------------|----------------|----------------|------------|
| Power Dissipation                       | (Note 5) | $P_D$           | 2.0            | W              |            |
|   | (Note 6) |                 | 16             |                |            |
| Linear Derating Factor                  | (Note 6) |                 | 3.9            | mW/ $^\circ C$ |            |
|   |          |                 | 31             |                |            |
| Thermal Resistance, Junction to Ambient | (Note 5) | $R_{\theta JA}$ | 62.5           | $^\circ C/W$   |            |
|   | (Note 6) |                 | 32.0           |                |            |
| Thermal Resistance, Junction to Lead    | (Note 8) | $R_{\theta JL}$ | 9.8            | $^\circ C/W$   |            |
| Operating and Storage Temperature Range |          |                 | $T_J, T_{STG}$ | -55 to +150    | $^\circ C$ |

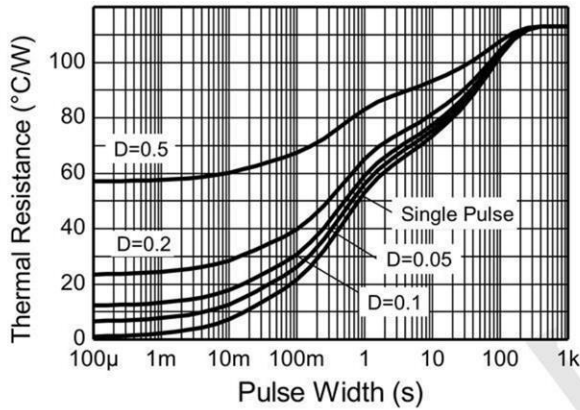
**Electrical Characteristics (  $T_A = 25^\circ\text{C}$  unless otherwise noted )**

[www.sot23.com.tw](http://www.sot23.com.tw)

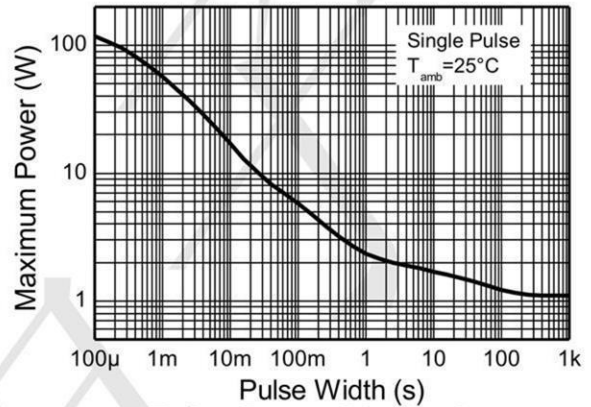
| Characteristic                             | Symbol       | Min  | Typ   | Max       | Unit          | Test Condition  |
|--|--------------|------|-------|-----------|---------------|---|
| <b>OFF CHARACTERISTICS</b>                 |              |      |       |           |               |   |
| Drain-Source Breakdown Voltage             | $BV_{DSS}$   | -60  | —     | —         | V             | $I_D = -250\mu\text{A}$ , $V_{GS} = 0\text{V}$  |
| Zero Gate Voltage Drain Current            | $I_{DSS}$    | —    | —     | -1        | $\mu\text{A}$ | $V_{DS} = -48\text{V}$ , $V_{GS} = 0\text{V}$   |
| Gate-Source Leakage                        | $I_{GSS}$    | —    | —     | $\pm 100$ | nA            | $V_{GS} = \pm 20\text{V}$ , $V_{DS} = 0\text{V}$  |
| <b>ON CHARACTERISTICS</b>                  |              |      |       |           |               |   |
| Gate Threshold Voltage                     | $V_{GS(th)}$ | -2.0 | -3.0  | -4.0      | V             | $I_D = -250\mu\text{A}$ , $V_{DS} = V_{GS}$   |
| Static Drain-Source On-Resistance (Note 8) | $R_{DS(on)}$ | —    | 95    | 120       | m $\Omega$    | $V_{GS} = -10\text{V}$ , $I_D = -3\text{A}$   |
|  |              |      | 130   | 190       |               | $V_{GS} = -4.5\text{V}$ , $I_D = -1.9\text{A}$  |
| Forward Transconductance (Notes 8 & 9)     | $g_{fs}$     | —    | 4.7   | —         | S             | $V_{DS} = -15\text{V}$ , $I_D = -2.3\text{A}$   |
| Diode Forward Voltage (Note 8)             | $V_{SD}$     | —    | -0.85 | -0.95     | V             | $I_S = -2\text{A}$ , $V_{GS} = 0\text{V}$   |
| Reverse Recovery Time (Note 9)             | $t_{rr}$     | —    | 25.1  | —         | ns            | $I_F = -1.7\text{A}$ , $di/dt = 100\text{A}/\mu\text{s}$                                    |
| Reverse Recovery Charge (Note 9)           | $Q_{rr}$     | —    | 27.2  | —         | nC            |   |
| <b>DYNAMIC CHARACTERISTICS (Note 9)</b>    |              |      |       |           |               |   |
| Input Capacitance                          | $C_{iss}$    | —    | 637   | —         | pF            | $V_{DS} = -30\text{V}$ , $V_{GS} = 0\text{V}$<br>$f = 1\text{MHz}$                          |
| Output Capacitance                         | $C_{oss}$    | —    | 70    | —         | pF            |   |
| Reverse Transfer Capacitance               | $C_{rss}$    | —    | 53    | —         | pF            |   |
| Total Gate Charge (Note 10)                | $Q_g$        | —    | 9.8   | —         | nC            | $V_{GS} = -5\text{V}$   |
| Total Gate Charge (Note 10)                | $Q_g$        | —    | 17.7  | —         | nC            |   |
| Gate-Source Charge (Note 10)               | $Q_{gs}$     | —    | 1.6   | —         | nC            | $V_{GS} = -10\text{V}$  |
| Gate-Drain Charge (Note 10)                | $Q_{gd}$     | —    | 4.4   | —         | nC            |   |
| Turn-On Delay Time (Note 10)               | $t_{D(on)}$  | —    | 2.6   | —         | ns            | $V_{DD} = -30\text{V}$ , $V_{GS} = -10\text{V}$<br>$I_D = -1\text{A}$ , $R_G \cong 6\Omega$ |
| Turn-On Rise Time (Note 10)                | $t_r$        | —    | 3.4   | —         | ns            |   |
| Turn-Off Delay Time (Note 10)              | $t_{D(off)}$ | —    | 26.2  | —         | ns            |   |
| Turn-Off Fall Time (Note 10)               | $t_f$        | —    | 11.3  | —         | ns            |   |

**Typical Performance Characteristics ( $T_A = 25^\circ\text{C}$  unless otherwise Specified)**

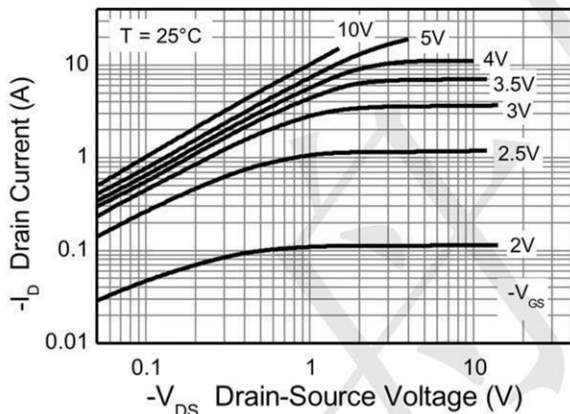




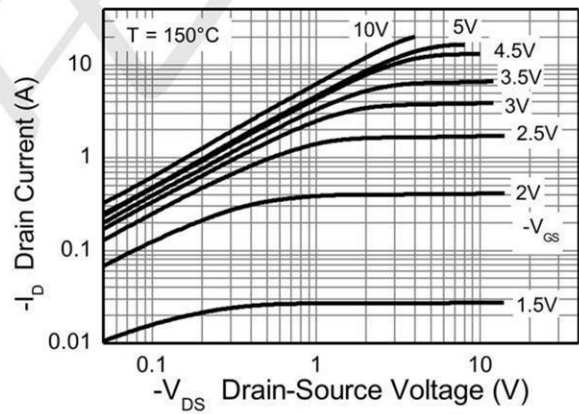
**Transient Thermal Impedance**



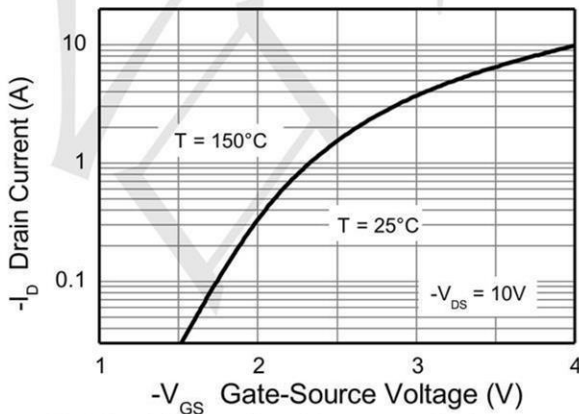
**Pulse Power Dissipation**



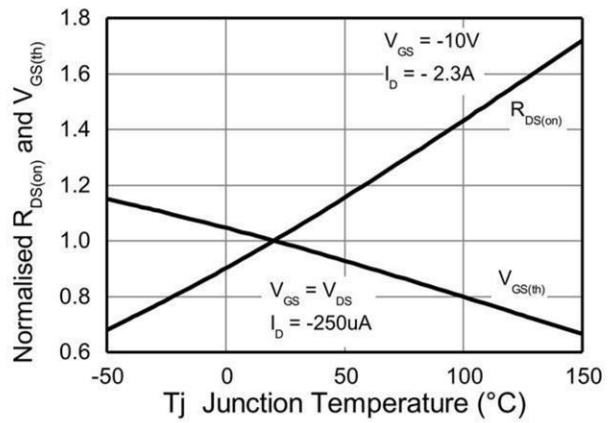
**Output Characteristics**



**Output Characteristics**



**Typical Transfer Characteristics**



**Normalised Curves v Temperature**





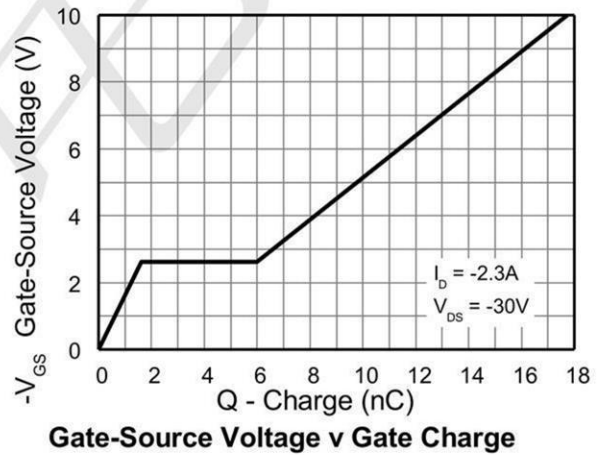
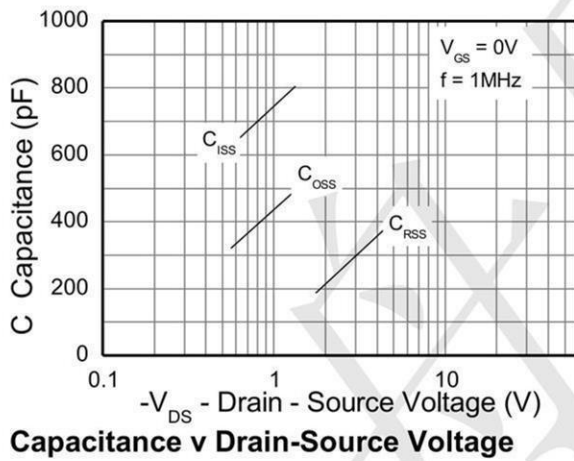
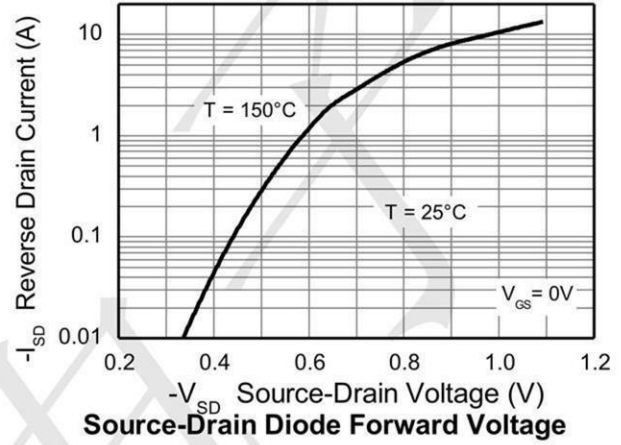
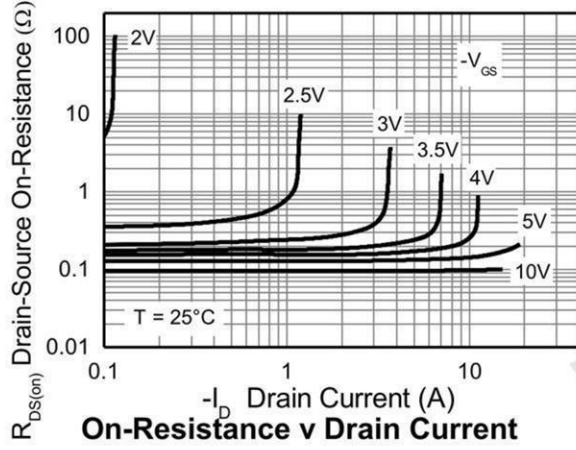
TECH PUBLIC

台丹电子

BSP170P

60V P-CHANNEL ENHANCEMENT MODE MOSFET

[www.sot23.com.tw](http://www.sot23.com.tw)





**TECH PUBLIC**

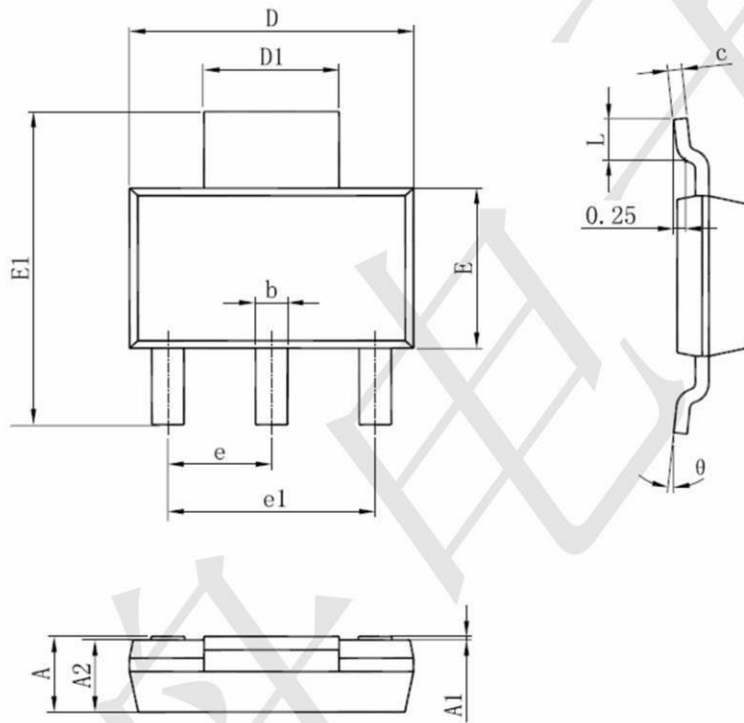
—台丹电子—

**BSP170P**

60V P-CHANNEL ENHANCEMENT MODE MOSFET

[www.sot23.com.tw](http://www.sot23.com.tw)

SOT223 Package Information



| Symbol | Dimensions In Millimeters |       | Dimensions In Inches |       |
|--------|---------------------------|-------|----------------------|-------|
|        | Min                       | Max   | Min                  | Max   |
| A      | 1.520                     | 1.800 | 0.060                | 0.071 |
| A1     | 0.000                     | 0.100 | 0.000                | 0.004 |
| A2     | 1.500                     | 1.700 | 0.059                | 0.067 |
| b      | 0.660                     | 0.820 | 0.026                | 0.032 |
| c      | 0.250                     | 0.350 | 0.010                | 0.014 |
| D      | 6.200                     | 6.400 | 0.244                | 0.252 |
| D1     | 2.900                     | 3.100 | 0.114                | 0.122 |
| E      | 3.300                     | 3.700 | 0.130                | 0.146 |
| E1     | 6.830                     | 7.070 | 0.269                | 0.278 |
| e      | 2.300(BSC)                |       | 0.091(BSC)           |       |
| e1     | 4.500                     | 4.700 | 0.177                | 0.185 |
| L      | 0.900                     | 1.150 | 0.035                | 0.045 |
| θ      | 0°                        | 10°   | 0°                   | 10°   |

## X-ON Electronics

Largest Supplier of Electrical and Electronic Components

*Click to view similar products for [MOSFET](#) category:*

*Click to view products by [TECH PUBLIC](#) manufacturer:*

Other Similar products are found below :

[IRFD120](#) [JANTX2N5237](#) [2SK2267\(Q\)](#) [BUK455-60A/B](#) [TK100A10N1,S4X\(S](#) [MIC4420CM-TR](#) [VN1206L](#) [NDP4060](#) [SI4482DY](#)  
[IRS2092STRPBF-EL](#) [IPS70R2K0CEAKMA1](#) [SQM120N06-3M5L-GE3](#) [TK31J60W5,S1VQ\(O](#) [TK31J60W,S1VQ\(O](#) [TK16J60W,S1VQ\(O](#)  
[2SK2614\(TE16L1,Q\)](#) [DMN1017UCP3-7](#) [EFC2J004NUZTDG](#) [P85W28HP2F-7071](#) [NTE2384](#) [DMC2700UDMQ-7](#) [DMN2080UCB4-7](#)  
[DMN61D9UWQ-13](#) [US6M2GTR](#) [DMN31D5UDJ-7](#) [DMP22D4UFO-7B](#) [IPS60R3K4CEAKMA1](#) [DMN1006UCA6-7](#) [DMN16M9UCA6-7](#)  
[STF5N65M6](#) [IRF40H233XTMA1](#) [STU5N65M6](#) [DMN6022SSD-13](#) [DMN13M9UCA6-7](#) [DMTH10H4M6SPS-13](#) [IPS60R360PFD7SAKMA1](#)  
[DMN2990UFB-7B](#) [SSM3K35CT,L3F](#) [IPLK60R1K0PFD7ATMA1](#) [2N7002W-G](#) [MCAC30N06Y-TP](#) [IPWS65R035CFD7AXKSA1](#)  
[MCQ7328-TP](#) [SSM3J143TU,LXHF](#) [PJMF280N65E1\\_T0\\_00201](#) [PJMF380N65E1\\_T0\\_00201](#) [PJMF280N60E1\\_T0\\_00201](#)  
[PJMF600N65E1\\_T0\\_00201](#) [PJMF900N65E1\\_T0\\_00201](#) [PJMF900N60E1\\_T0\\_00201](#)