

60V N-CHANNEL ENHANCEMENT MODE VERTICAL DMOSFET

Features

- $BV_{DSS} > 60V$
- $R_{DS(ON)} \leq 5\Omega$ @ $V_{GS} = 10V$
- $I_D = 270mA$ Maximum Continuous Drain Current
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

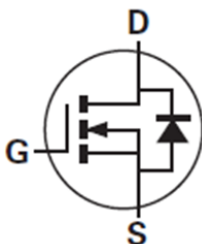
Mechanical Data

- Case: E-Line (TO-92 Compatible)
- Case Material: Molded Plastic, "Green" Molding Compound
UL Flammability Rating 94V-0
- Terminals: Finish - Matte Tin Plated Leads, Solderable per
MIL-STD-202, Method 208 @3
- Weight: 0.159 grams (Approximate)

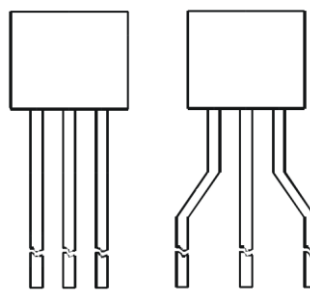
E-Line
(TO-92 Compatible)



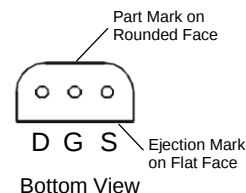
Flat Face View



Device Symbol



Rounded Face View



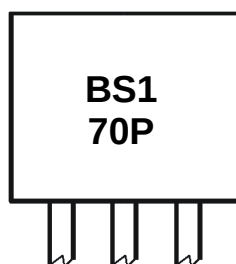
Bottom View

Ordering Information (Note 4)

Product	Marking	Package	Leads	Quantity
BS170P	BS170P	E-Line	Straight	4,000 Loose in a Box
BS170PSTZ	BS170P	E-Line	Joggled	2,000 Taped per Ammo Box

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
 2. See http://www.diodes.com/quality/lead_free.html for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
 3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
 4. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

Marking Information



Rounded Face View

BS170P = Product Type Marking Code

Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Drain-Source Voltage	V _{DSS}	60	V
Gate-Source Voltage	V _{GSS}	±20	V
Continuous Drain Current	I _D	270	mA
Pulsed Drain Current	I _{DM}	3	A

Thermal Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Power Dissipation	P _D	625	mW
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

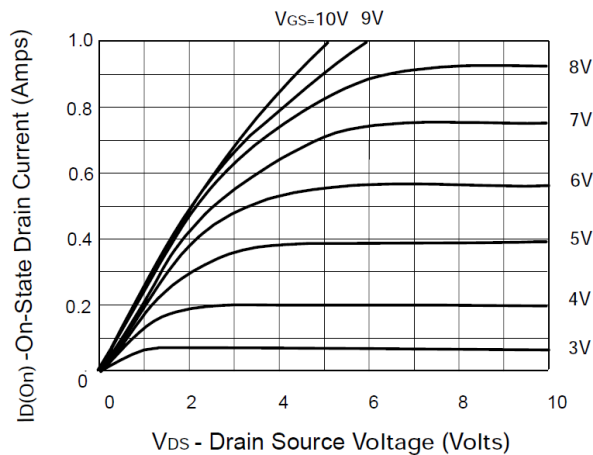
Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	60	—	—	V	I _D = 100μA, V _{GS} = 0V
Zero Gate Voltage Drain Current	I _{DSS}	—	—	0.5	μA	V _{DS} = 25V, V _{GS} = 0V
Gate-Body Leakage	I _{GSS}	—	—	±10	nA	V _{GS} = ±15V, V _{DS} = 0V
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(th)}	0.8	—	3.0	V	I _D = 1mA, V _{DS} = V _{GS}
Static Drain-Source On-Resistance (Note 5)	R _{DS(ON)}	—	—	5	Ω	V _{GS} = 10V, I _D = 200mA
Forward Transconductance (Notes 5 & 7)	g _{fs}	—	200	—	mS	V _{DS} = 10V, I _D = 200mA
DYNAMIC CHARACTERISTICS (Note 7)						
Input Capacitance	C _{iss}	—	60	—	pF	V _{DS} = 10V, V _{GS} = 0V f = 1.0MHz
Turn-On Delay Time (Note 6)	t _{D(ON)}	—	—	10	ns	V _{DD} = 15V, I _D = 600mA
Turn-Off Delay Time (Note 6)	t _{D(OFF)}	—	—	10		

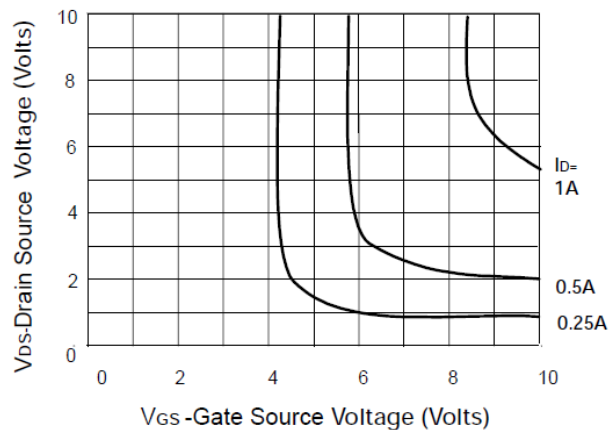
- Notes:
5. Measured under pulsed conditions. Pulse width ≤ 300μs. Duty cycle ≤ 2%.
 6. Switching characteristics are independent of operating junction temperature. Switching times are measured with a 50Ω source impedance and <5ns rise time on a pulse generator.
 7. For design aid only, not subject to production testing.

Typical Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

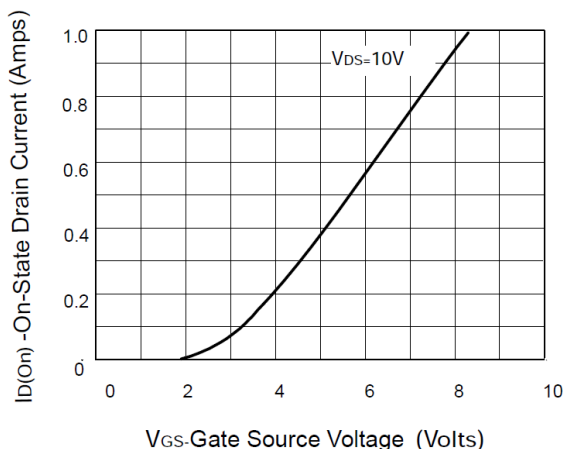
NEW PRODUCT



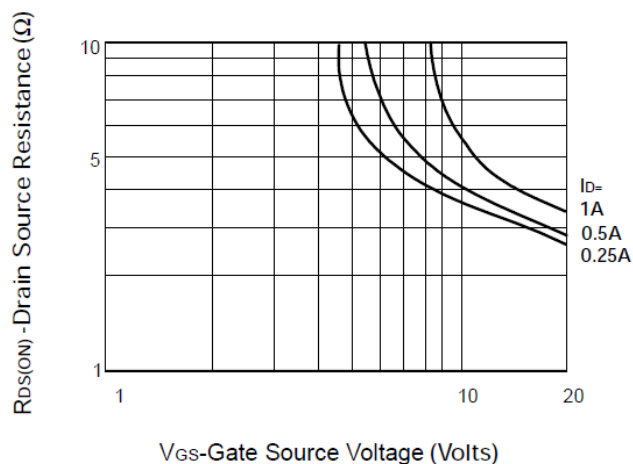
Saturation Characteristics



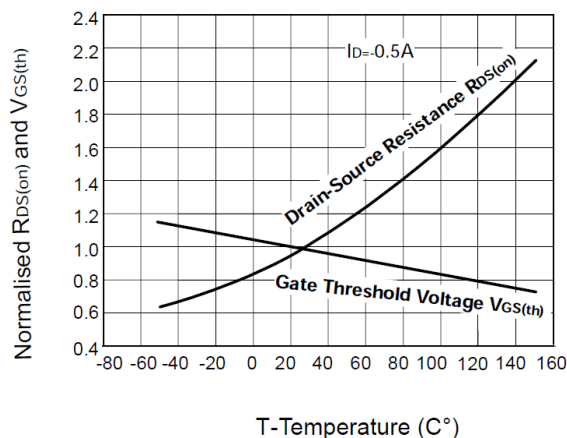
Voltage Saturation Characteristics



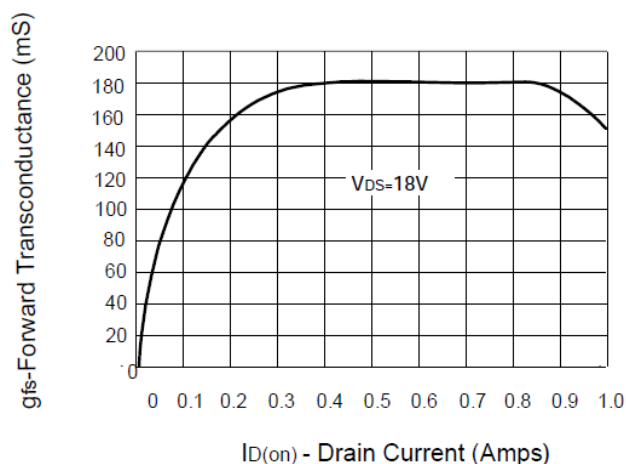
Transfer Characteristics



On-resistance vs gate-source voltage

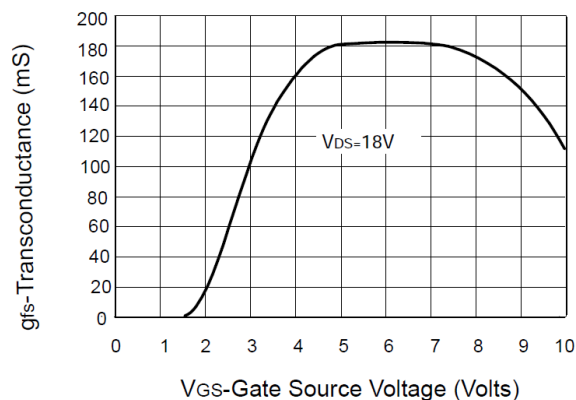


Normalised $R_{DS(on)}$ and $V_{GS(th)}$ vs Temperature

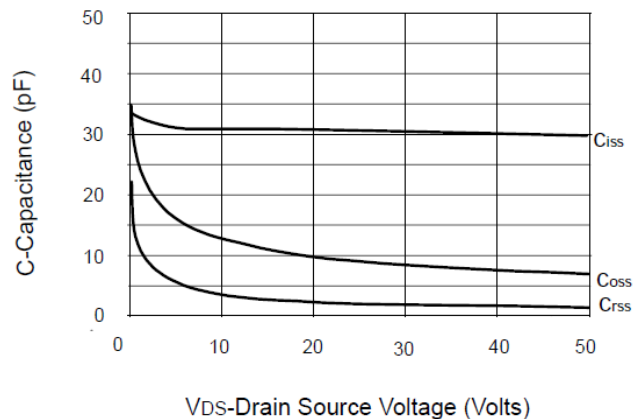


Transconductance v drain current

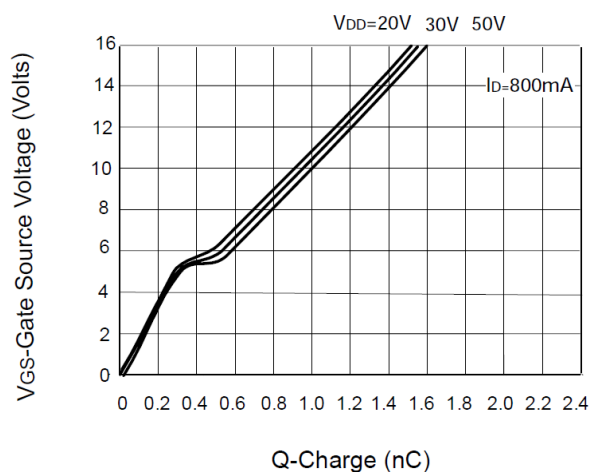
Typical Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.) (Cont.)



Transconductance v gate-source voltage



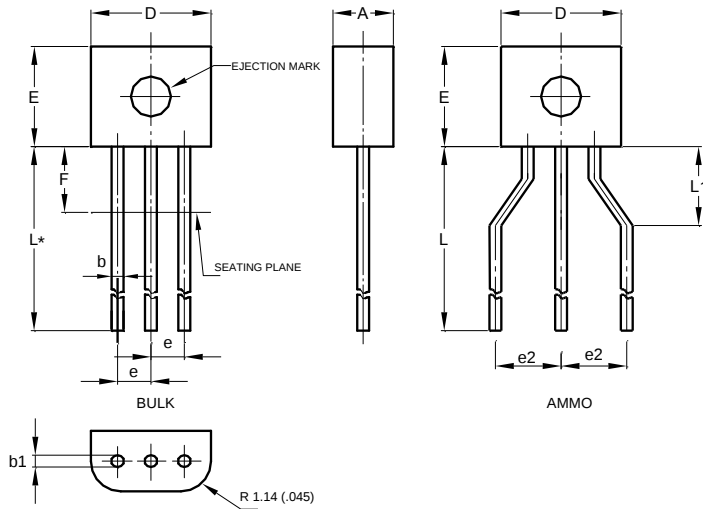
Capacitance v drain-source voltage



Gate charge v gate-source voltage

Package Outline Dimensions

Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



E-Line			
Dim	Min	Max	Typ
A	2.16	2.41	—
b	0.41	0.495	—
b1	0.41	0.495	—
D	4.37	4.77	—
E	3.61	4.01	—
e	—	—	1.27
e2	—	—	2.54
F	—	2.50	—
L	13.00	13.97	—
L1	2.50	3.50	—
All Dimensions in mm			

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