

## 200V N-CHANNEL ENHANCEMENT MODE VERTICAL DMOSFET

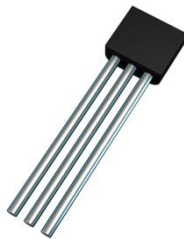
### Features

- $BV_{DSS} > 200V$
- $R_{DS(ON)} \leq 23\Omega @ V_{GS} = 2.6V$
- $I_D = 120mA$  Maximum Continuous Drain Current
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **For automotive applications requiring specific change control (i.e.: parts qualified to AEC-Q101, PPAP capable, and manufactured in IATF 16949 certified facilities), please refer to the related automotive grade (Q-suffix) part. A listing can be found at <https://www.diodes.com/products/automotive/automotive-products/>.**
- **This part is qualified to JEDEC standards (as references in AEC-Q101) for High Reliability.**
- <https://www.diodes.com/quality/product-definitions/>

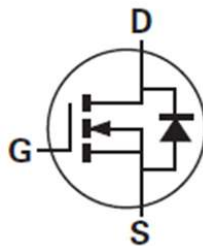
### Mechanical Data

- 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)

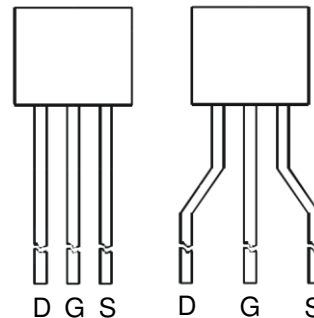
E-Line  
(TO-92 Compatible)



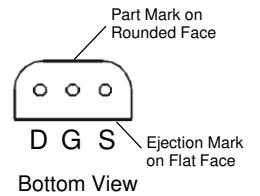
Flat Face View



Device Symbol



Rounded Face View



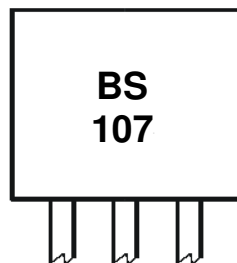
Bottom View

### Ordering Information (Note 4)

Product	Marking	Package	Leads	Quantity
BS107P	BS107	E-Line	Straight	4,000 Loose in a Box
BS107PSTZ	BS107	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) & 2015/863/EU (RoHS 3) compliant.
  2. See <https://www.diodes.com/quality/lead-free/> 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 <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

### Marking Information



Rounded Face View

BS107 = Product Type Marking Code

### Maximum Ratings (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Drain-Source Voltage	V <sub>DSS</sub>	200	V
Gate-Source Voltage	V <sub>GSS</sub>	±20	V
Continuous Drain Current	I <sub>D</sub>	120	mA
Pulsed Drain Current	I <sub>DM</sub>	2	A

### Thermal Characteristics (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	P <sub>D</sub>	500	mW
Thermal Resistance, Junction to Ambient (Note 5)	R <sub>θJA</sub>	200	°C/W
Thermal Resistance, Junction to Leads (Note 6)	R <sub>θJL</sub>	71	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

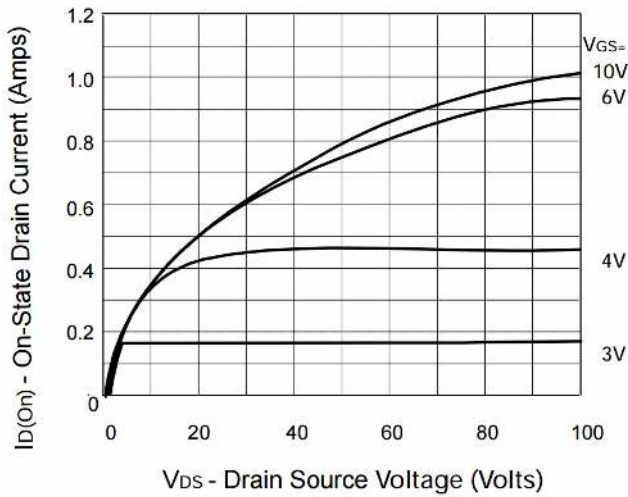
- Notes:
- For a through-hole device mounted on the minimum recommended pad layout with 12mm lead length from the bottom of package to the single-sided FR-4 PCB; device is measured under still air conditions whilst operating in a steady-state.
  - Thermal resistance from junction to solder-point at the seating plane (2.5mm from the bottom of package along the drain lead).

### Electrical Characteristics (@T<sub>A</sub> = +25°C, unless otherwise specified.)

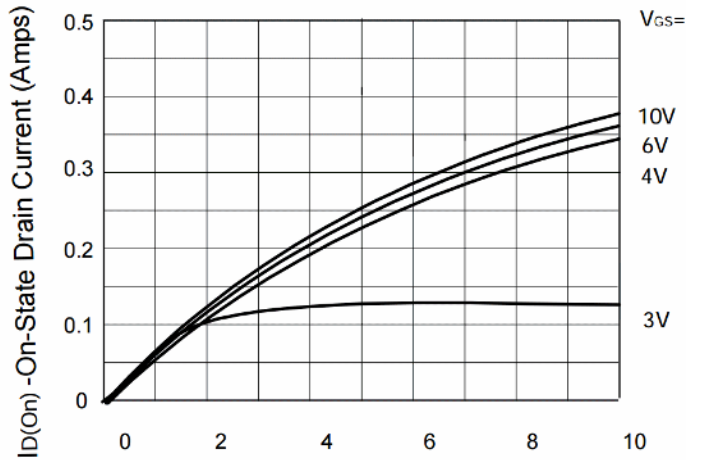
Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	BV <sub>DSS</sub>	200	230	—	V	I <sub>D</sub> = 100µA, V <sub>GS</sub> = 0V
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	—	—	30	nA	V <sub>DS</sub> = 130V, V <sub>GS</sub> = 0V
Drain Cut-Off Current	I <sub>DSX</sub>	—	—	1	µA	V <sub>DS</sub> = 70V, V <sub>GS</sub> = 0.2V
Gate-Source Leakage	I <sub>GSS</sub>	—	—	±10	nA	V <sub>GS</sub> = ±15V, V <sub>DS</sub> = 0V
<b>ON CHARACTERISTICS</b>						
Gate Threshold Voltage	V <sub>GS(TH)</sub>	1.0	—	3.0	V	I <sub>D</sub> = 1mA, V <sub>DS</sub> = V <sub>GS</sub>
Static Drain-Source On-Resistance (Note 7)	R <sub>DS(ON)</sub>	—	15	23	Ω	V <sub>GS</sub> = 2.6V, I <sub>D</sub> = 25mA
			—	30		V <sub>GS</sub> = 5V, I <sub>D</sub> = 100mA
Forward Transconductance (Notes 7 & 9)	g <sub>fs</sub>	100	—	—	mS	V <sub>DS</sub> = 25V, I <sub>D</sub> = 250mA
<b>DYNAMIC CHARACTERISTICS (Note 9)</b>						
Input Capacitance	C <sub>iSS</sub>	—	—	85	pF	V <sub>DS</sub> = 25V, V <sub>GS</sub> = 0V f = 1.0MHz
Output Capacitance	C <sub>oss</sub>	—	—	20		
Reverse Transfer Capacitance	C <sub>rss</sub>	—	—	7		
Turn-On Delay Time (Note 8)	t <sub>D(ON)</sub>	—	—	7	ns	V <sub>DD</sub> = 25V, I <sub>D</sub> = 250mA
Turn-On Rise Time (Note 8)	t <sub>R</sub>	—	—	8		
Turn-Off Delay Time (Note 8)	t <sub>D(OFF)</sub>	—	—	16		
Turn-Off Fall Time (Note 8)	t <sub>F</sub>	—	—	8		

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

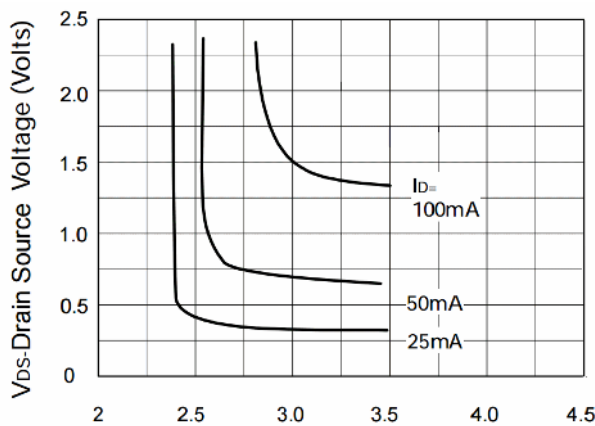
**Typical Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)



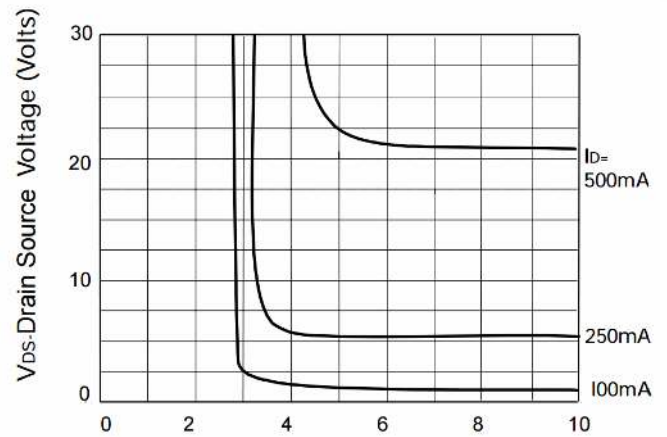
**Output Characteristics**



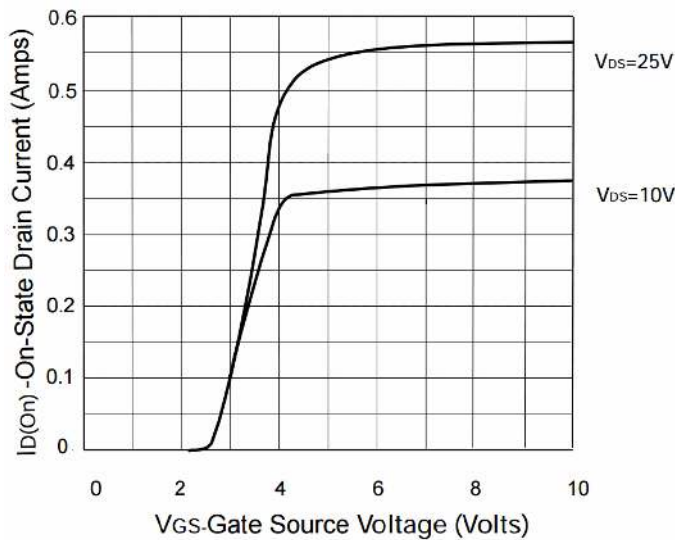
**Saturation Characteristics**



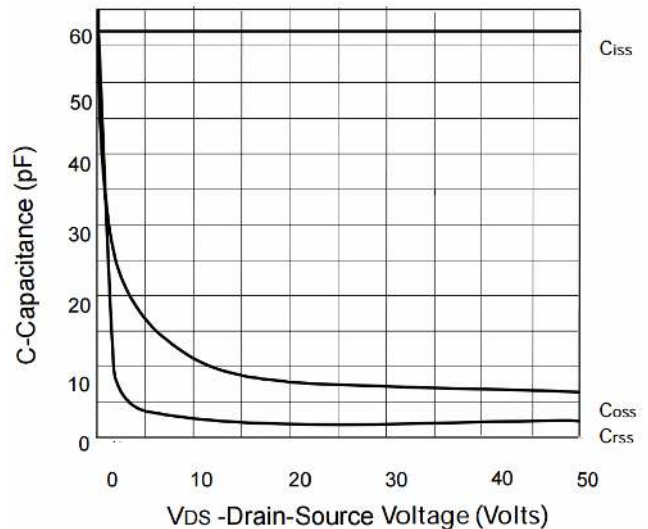
**Voltage Saturation Characteristics**



**Voltage Saturation Characteristics**



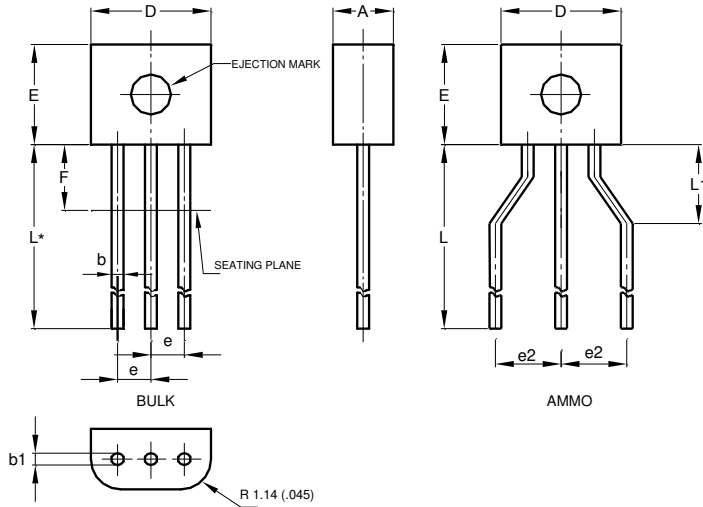
**Transfer characteristics**



**Capacitance v drain-source voltage**

**Package Outline Dimensions**

Please see <http://www.diodes.com/package-outlines.html> 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	-
<b>All Dimensions in mm</b>			

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