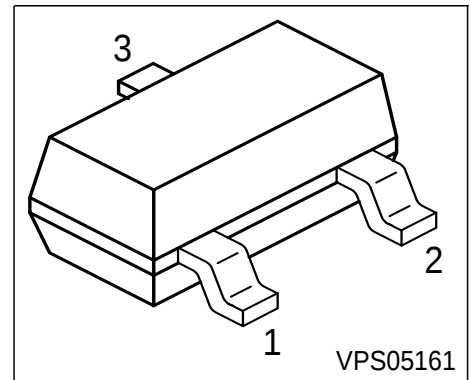


## Silicon N-Channel MOSFET Triode

- For high-frequency stages up to 300 MHz preferably in FM applications
- $I_{DSS} = 4\text{mA}$ ,  $g_{fs} = 12\text{mS}$



**ESD:** Electrostatic discharge sensitive device, observe handling precaution!

| Type  | Marking | Pin Configuration |       |       | Package |
|-------|---------|-------------------|-------|-------|---------|
| BF543 | LDs     | 1 = G             | 2 = D | 3 = S | SOT23   |

### Maximum Ratings

| Parameter                                            | Symbol        | Value       | Unit             |
|------------------------------------------------------|---------------|-------------|------------------|
| Drain-source voltage                                 | $V_{DS}$      | 20          | V                |
| Drain current                                        | $I_D$         | 30          | mA               |
| Gate-source peak current                             | $\pm I_{GSM}$ | 10          |                  |
| Total power dissipation, $T_S \leq 76^\circ\text{C}$ | $P_{tot}$     | 200         | mW               |
| Storage temperature                                  | $T_{stg}$     | -55 ... 150 | $^\circ\text{C}$ |
| Ambient temperature range                            | $T_A$         | -55 ... 150 |                  |
| Channel temperature                                  | $T_{ch}$      | 150         |                  |

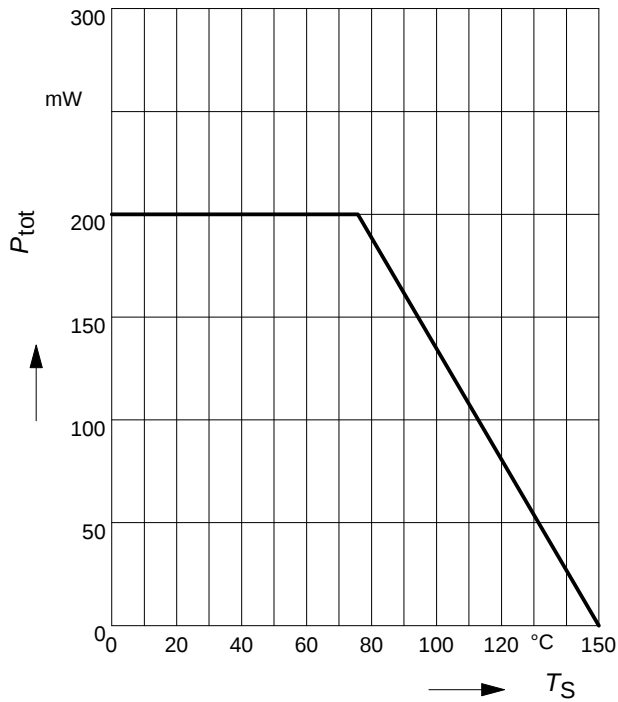
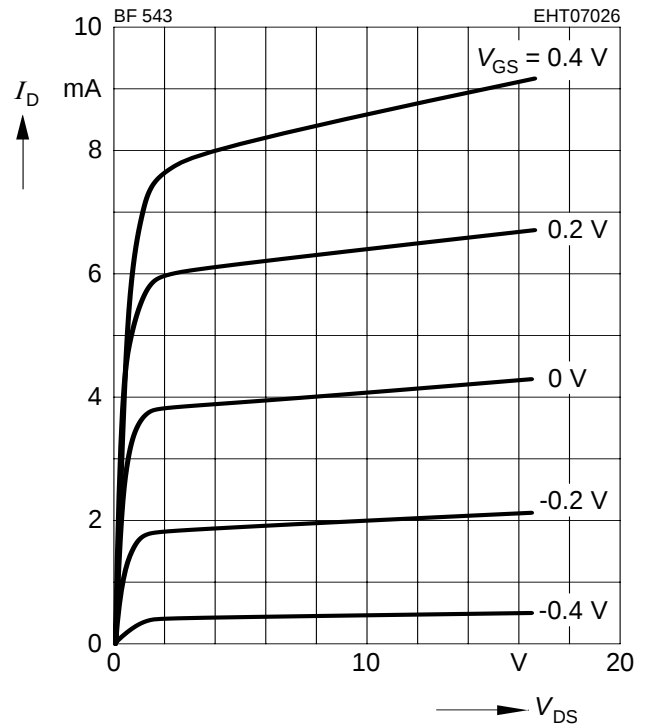
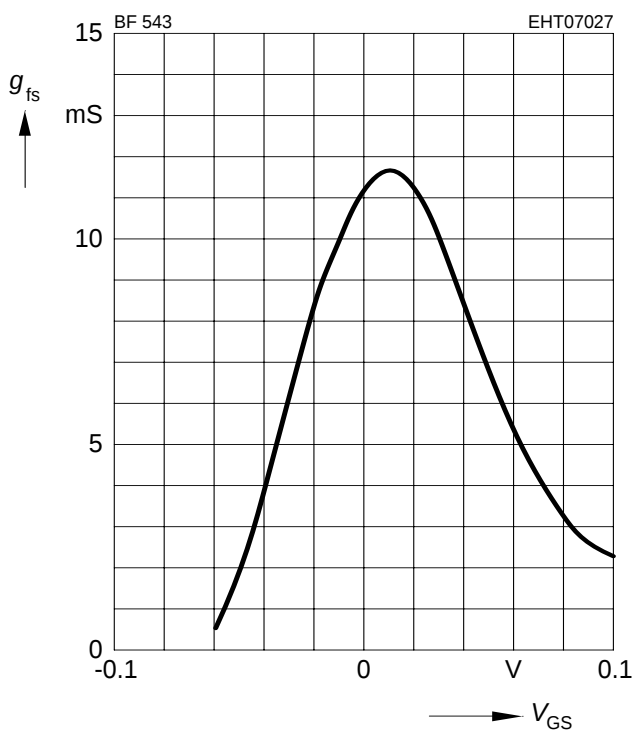
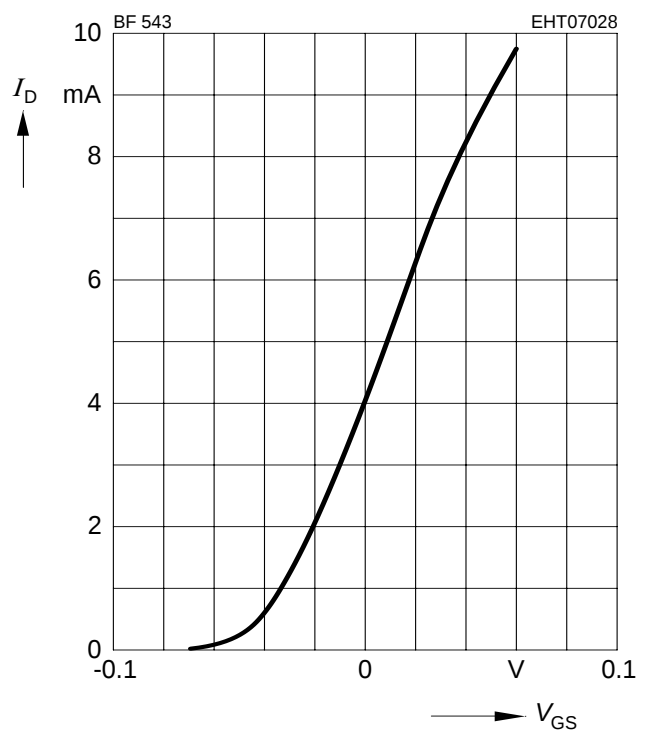
### Thermal Resistance

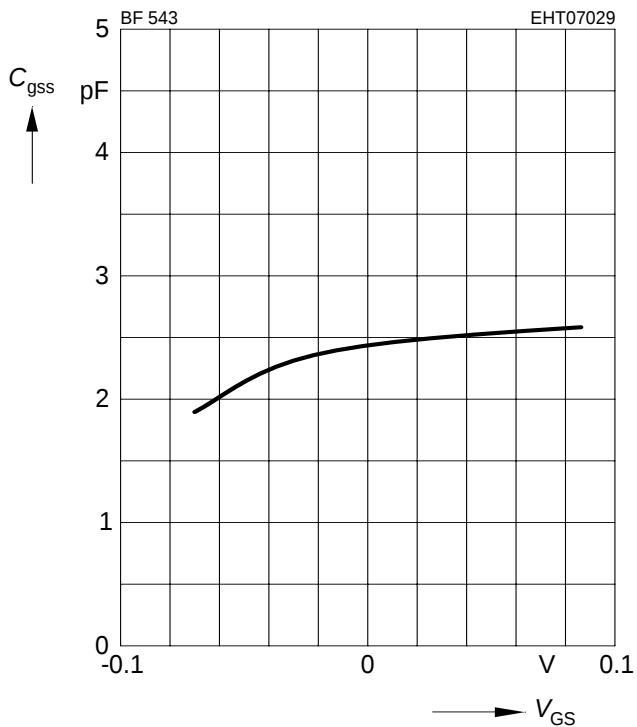
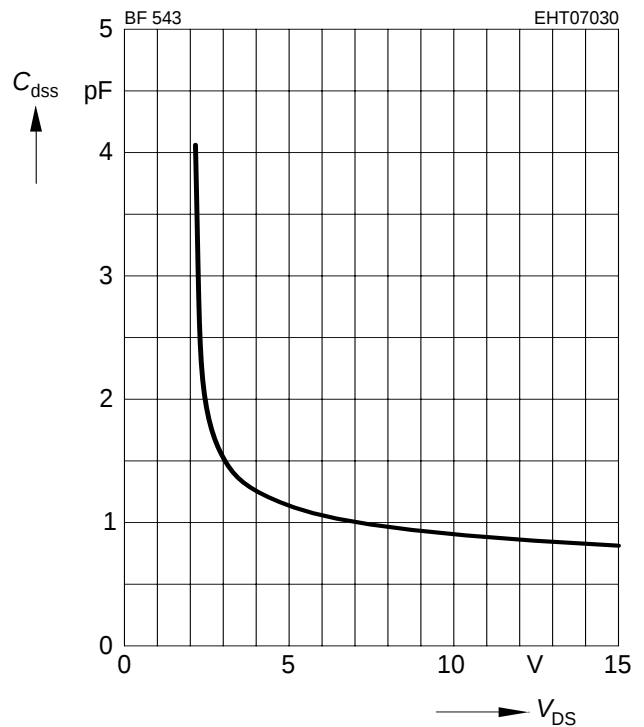
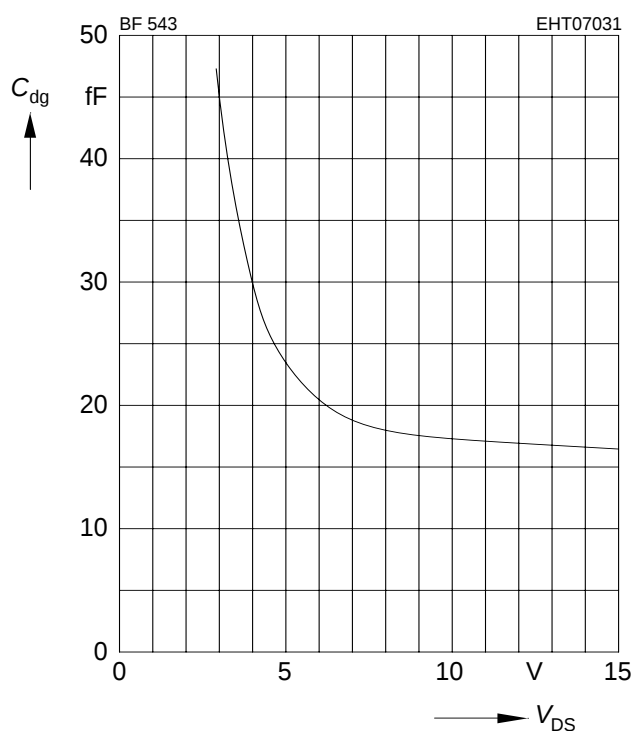
|                                         |             |            |     |
|-----------------------------------------|-------------|------------|-----|
| Channel - soldering point <sup>1)</sup> | $R_{thchs}$ | $\leq 370$ | K/W |
|-----------------------------------------|-------------|------------|-----|

<sup>1)</sup>For calculation of  $R_{thJA}$  please refer to Application Note Thermal Resistance

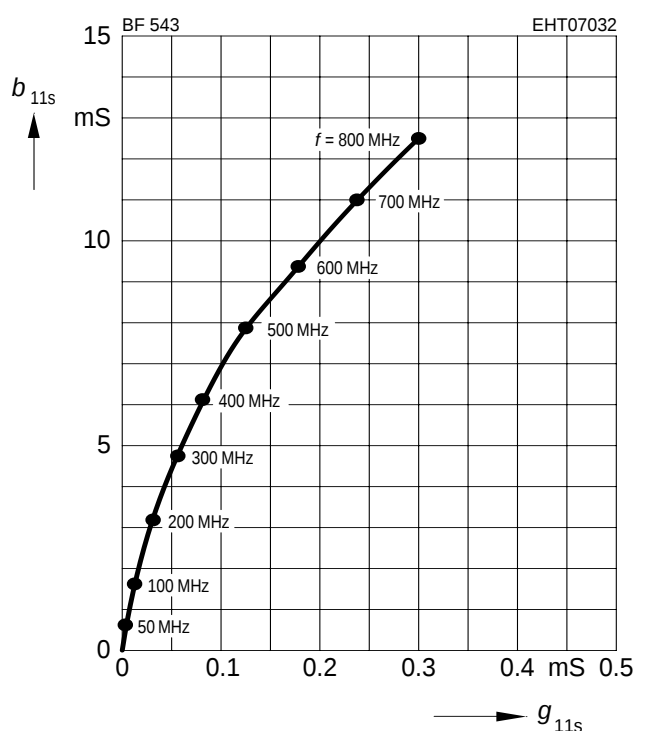
**Electrical Characteristics** at  $T_A = 25\text{ °C}$ , unless otherwise specified.

| Parameter                                                                                                                                        | Symbol            | Values |      |      | Unit |
|--------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|--------|------|------|------|
|                                                                                                                                                  |                   | min.   | typ. | max. |      |
| DC characteristics                                                                                                                               |                   |        |      |      |      |
| Drain-source breakdown voltage<br>$I_D = 10\text{ }\mu\text{A}$ , $-V_{GS} = 4\text{ V}$                                                         | $V_{(BR)DS}$      | 20     | -    | -    | V    |
| Gate-source breakdown voltage<br>$\pm I_{GS} = 10\text{ mA}$ , $V_{DS} = 0$                                                                      | $\pm V_{(BR)GSS}$ | 7      | -    | 12   |      |
| Gate-source leakage current<br>$\pm V_{GS} = 6\text{ V}$ , $V_{DS} = 0$                                                                          | $\pm I_{GSS}$     | -      | -    | 50   | nA   |
| Drain current<br>$V_{DS} = 10\text{ V}$ , $V_{GS} = 0$                                                                                           | $I_{DSS}$         | 2      | 4    | 6    | mA   |
| Gate-source pinch-off voltage<br>$V_{DS} = 10\text{ V}$ , $I_D = 20\text{ }\mu\text{A}$                                                          | $-V_{GS(p)}$      | -      | 0.7  | 1.5  | V    |
| AC characteristics                                                                                                                               |                   |        |      |      |      |
| Forward tranconductance<br>$V_{DS} = 10\text{ V}$ , $I_D = 4\text{ mA}$                                                                          | $g_{fs}$          | 9.5    | 12   | -    | mS   |
| Gate input capacitance<br>$V_{DS} = 10\text{ V}$ , $I_D = 4\text{ mA}$ , $f = 1\text{ MHz}$                                                      | $C_{gss}$         | -      | 2.7  | -    | pF   |
| Reverse tranfer capacitance<br>$V_{DS} = 10\text{ V}$ , $I_D = 4\text{ mA}$ , $f = 1\text{ MHz}$                                                 | $C_{dg}$          | -      | 18   | -    | fF   |
| Output capacitance<br>$V_{DS} = 10\text{ V}$ , $I_D = 4\text{ mA}$ , $f = 1\text{ MHz}$                                                          | $C_{dss}$         | -      | 0.9  | -    | pF   |
| Power gain (test circuit)<br>$G_G = 2\text{mS}$ , $G_L = 0,5\text{ mS}$<br>$V_{DS} = 10\text{ V}$ , $I_D = 4\text{ mA}$ , $f = 200\text{ MHz}$   | $G_p$             | -      | 22   | -    | dB   |
| Noise figure (test circuit)<br>$G_G = 2\text{mS}$ , $G_L = 0,5\text{ mS}$<br>$V_{DS} = 10\text{ V}$ , $I_D = 4\text{ mA}$ , $f = 200\text{ MHz}$ | $F$               | -      | 1    | -    |      |

**Total power dissipation  $P_{\text{tot}} = f(T_S)$** 

**Output characteristics  $I_D = f(V_{\text{DS}})$** 

**Gate transconductance  $g_{\text{fs}} = f(V_{\text{GS}})$** 
 $V_{\text{DS}} = 10$ ,  $I_{\text{DSS}} = 4$  mA,  $f = 1$  kHz

**Drain current  $I_D = f(V_{\text{GS}})$** 
 $V_{\text{DS}} = 10$  V


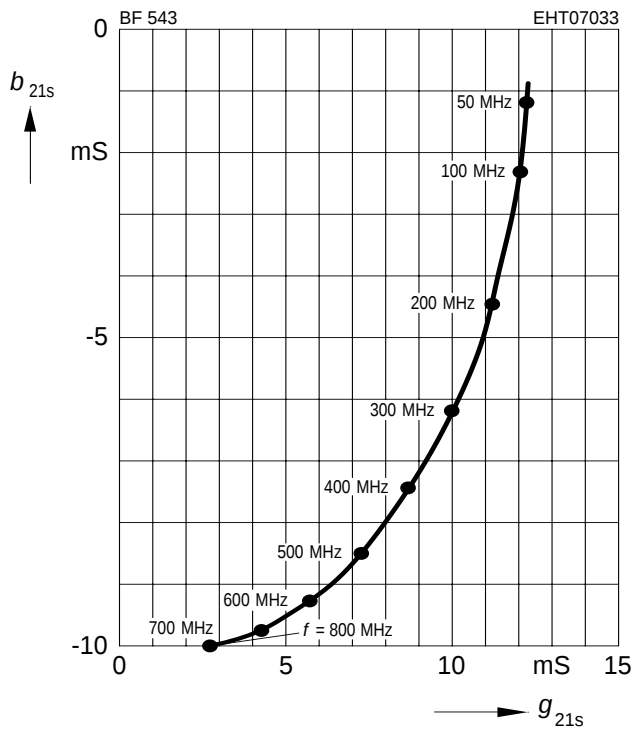
**Gate input capacitance  $C_{gss} = f(V_{GS})$** 
 $V_{DS} = 10, I_{DSS} = 4\text{mA}, f = 1\text{MHz}$ 

**Output capacitance  $C_{dss} = f(V_{DS})$** 
 $V_{GS} = 0, I_{DSS} = 4\text{mA}, f = 1\text{MHz}$ 

**Reverse transfer capacitance**
 $C_{dg} = f(V_{DS})$ 
 $V_{GS} = 0, I_{DSS} = 4\text{mA}, f = 1\text{MHz}$ 

**Gate input admittance  $y_{11s}$** 
 $V_{DS} = 10, I_{DSS} = 4\text{mA}, V_{GS} = 0$ 

(source circuit)



**Gate forward transfer admittance  $y_{21s}$** 
 $V_{DS} = 10V, I_{DSS} = 4mA, V_{GS} = 0$ 

(source circuit)


**Output admittance  $y_{22s}$** 
 $V_{DS} = 10V, I_{DSS} = 10mA, V_{GS} = 0$ 

(source circuit)

