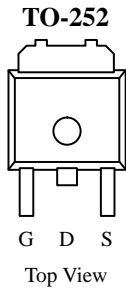


N-Channel Enhancement-Mode Transistors

Product Summary

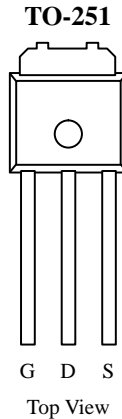
| $V_{(BR)DSS}$ (V) | $r_{DS(on)}$ (Ω) | I_D^a (A) |
|-------------------|---------------------------|-------------|
| 50 | 0.10 | 15 |

175°C Rated
Maximum Junction Temperature

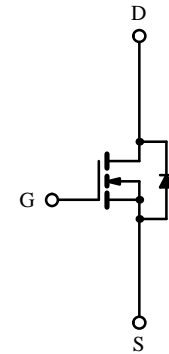


Drain connected to Tab

Order Number: SMD15N05



Order Number: SMU15N05



Absolute Maximum Ratings ($T_C = 25^\circ\text{C}$ Unless Otherwise Noted)

| Parameter | Symbol | SMD15N05 | SMU15N05 | Unit | |
|---|----------------|---------------------------|------------------|------------------|---|
| Drain-Source Voltage | V_{DS} | 50 | 50 | V | |
| Gate-Source Voltage | V_{GS} | ± 20 | ± 20 | | |
| Continuous Drain Current ^b | I_D | $T_A = 25^\circ\text{C}$ | 3.3 ^b | 2.3 ^c | A |
| | | $T_A = 100^\circ\text{C}$ | 1.9 ^b | 1.3 ^c | |
| Pulsed Drain Current (maximum current limited by package) | I_{DM} | 24 | 24 | | |
| Power Dissipation | P_D | $T_C = 25^\circ\text{C}$ | 40 | 40 | W |
| | | $T_A = 25^\circ\text{C}$ | 2.0 ^b | 1.0 ^c | |
| Operating Junction and Storage Temperature Range | T_J, T_{stg} | -55 to 175 | | $^\circ\text{C}$ | |
| Lead Temperature ($^{1/16}$ " from case for 10 sec.) | T_L | 300 | | | |

Thermal Resistance Ratings

| Parameter | Symbol | Typical | Maximum | Unit |
|--|------------|---------|---------|--------------------|
| Junction-to-Ambient Free Air, PC Board Mount | R_{thJA} | 50 | 60 | $^\circ\text{C/W}$ |
| Junction-to-Ambient Free Air, Vertical Mount | | | 125 | |
| Junction-to-Case | R_{thJC} | | 3.0 | |

Notes:

- Calculated Rating for $T_C = 25^\circ\text{C}$, for comparison purposes only. This cannot be used as continuous rating (see Absolute Maximum Ratings and Typical Characteristics).
- Surface mounted on PC board.
- Free air, vertical mount.

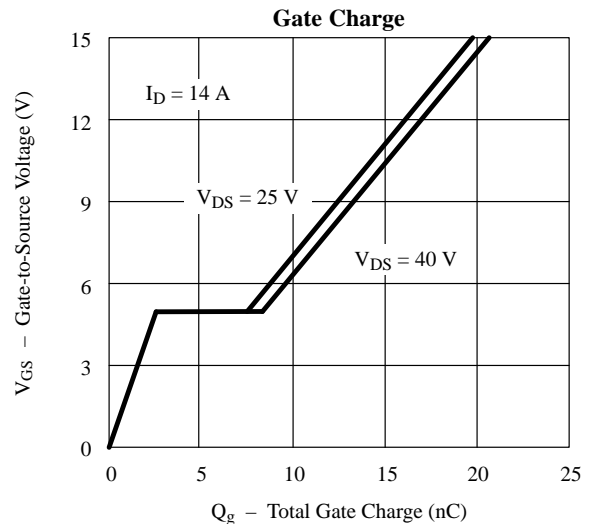
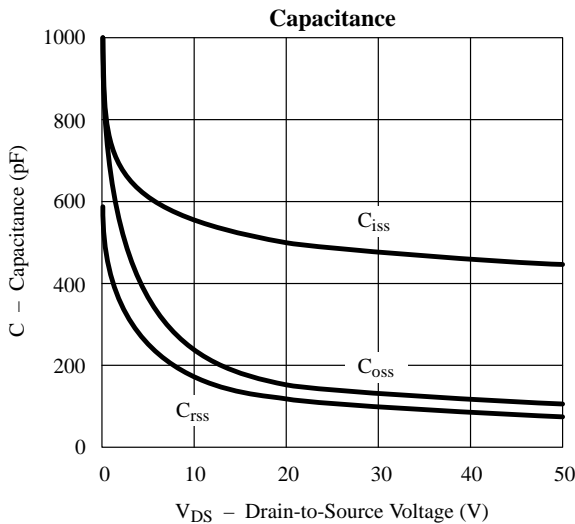
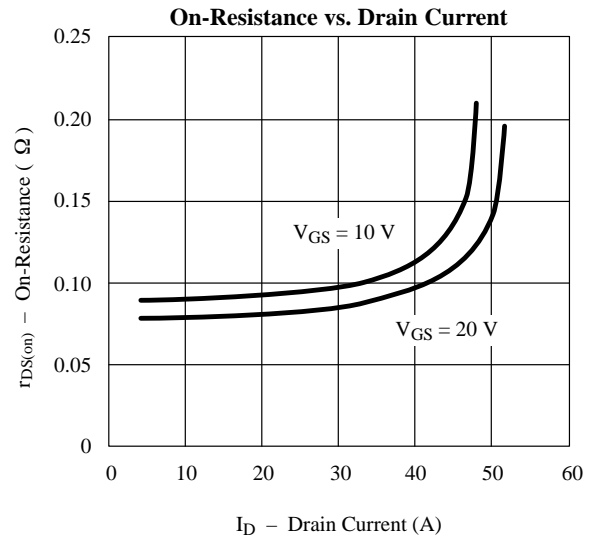
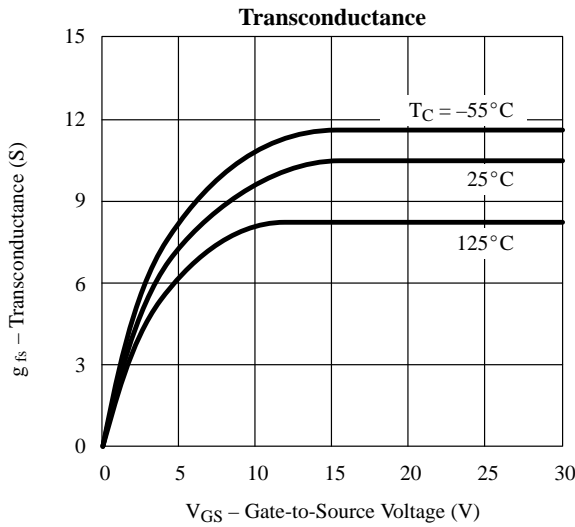
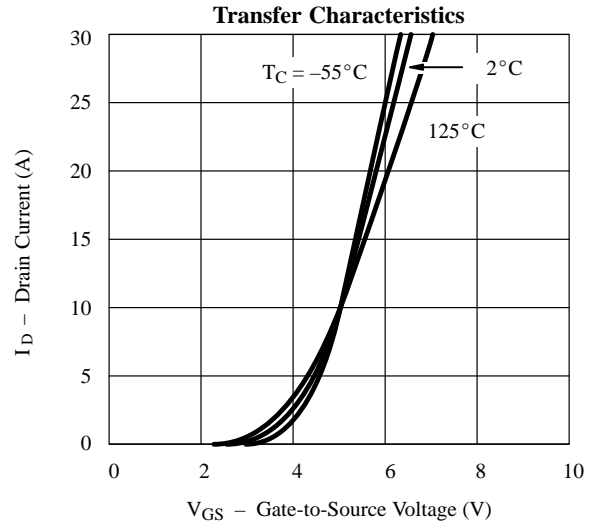
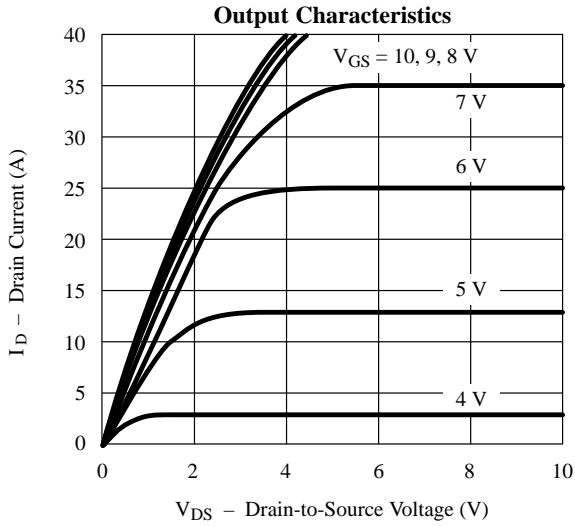
Specifications ($T_J = 25^\circ\text{C}$ Unless Otherwise Noted)

| Parameter | Symbol | Test Condition | Min | Typ ^a | Max | Unit |
|---|---------------|--|-----|------------------|-----------|---------------|
| Static | | | | | | |
| Drain-Source Breakdown Voltage | $V_{(BR)DSS}$ | $V_{GS} = 0\text{ V}, I_D = 250\ \mu\text{A}$ | 50 | | | V |
| Gate Threshold Voltage | $V_{GS(th)}$ | $V_{DS} = V_{GS}, I_D = 250\ \mu\text{A}$ | 2.0 | | 4.0 | |
| Gate-Body Leakage | I_{GSS} | $V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$ | | | ± 100 | nA |
| Zero Gate Voltage Drain Current | I_{DSS} | $V_{DS} = 40\text{ V}, V_{GS} = 0\text{ V}$ | | | 25 | μA |
| | | $V_{DS} = 40\text{ V}, V_{GS} = 0\text{ V}, T_J = 125^\circ\text{C}$ | | | 250 | |
| On-State Drain Current ^b | $I_{D(on)}$ | $V_{DS} = 5\text{ V}, V_{GS} = 10\text{ V}$ | 15 | | | A |
| Drain-Source On-State Resistance ^b | $r_{DS(on)}$ | $V_{GS} = 10\text{ V}, I_D = 7.5\text{ A}$ | | 0.07 | 0.10 | Ω |
| | | $V_{GS} = 10\text{ V}, I_D = 7.5\text{ A}, T_J = 125^\circ\text{C}$ | | 0.13 | 0.18 | |
| Forward Transconductance ^b | g_{fs} | $V_{DS} = 15\text{ V}, I_D = 7.5\text{ A}$ | 3.0 | 4.8 | | S |
| Dynamic | | | | | | |
| Input Capacitance | C_{iss} | $V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$ | | 550 | | μF |
| Output Capacitance | C_{oss} | | | 320 | | |
| Reverse Transfer Capacitance | C_{rss} | | | 100 | | |
| Total Gate Charge ^c | Q_g | $V_{DS} = 25\text{ V}, V_{GS} = 10\text{ V}, I_D = 15\text{ A}$ | | 15 | 30 | nC |
| Gate-Source Charge ^c | Q_{gs} | | | 3.5 | | |
| Gate-Drain Charge ^c | Q_{gd} | | | 5 | | |
| Turn-On Delay Time ^c | $t_{d(on)}$ | $V_{DD} = 25\text{ V}, R_L = 1.67\ \Omega$ $I_D = 15\text{ A}, V_{GEN} = 10\text{ V}, R_G = 25\ \Omega$ | | 15 | 30 | ns |
| Rise Time ^c | t_r | | | 50 | 85 | |
| Turn-Off Delay Time ^c | $t_{d(off)}$ | | | 80 | 90 | |
| Fall Time ^c | t_f | | | 80 | 110 | |
| Source-Drain Diode Ratings and Characteristics | | | | | | |
| Continuous Current | I_S | SMD15N05 | | | 3.3 | A |
| | | SMU15N05 | | | 1.0 | |
| Pulsed Current | I_{SM} | | | | 24 | |
| Forward Voltage ^b | V_{SD} | $I_F = 3.3\text{ A}, V_{GS} = 0\text{ V}$ | | 1.8 | 2.3 | V |
| Reverse Recovery Time | t_{rr} | $I_F = 3.3\text{ A}, dI_F/dt = 100\text{ A}/\mu\text{s}$ | | 65 | | ns |
| Reverse Recovery Charge | Q_{rr} | | | 0.16 | | μC |

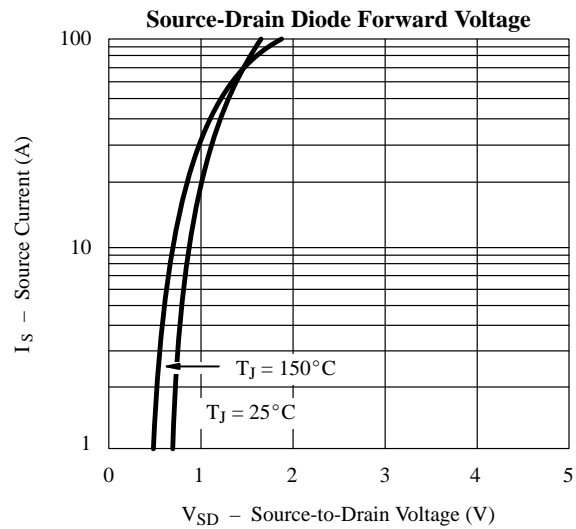
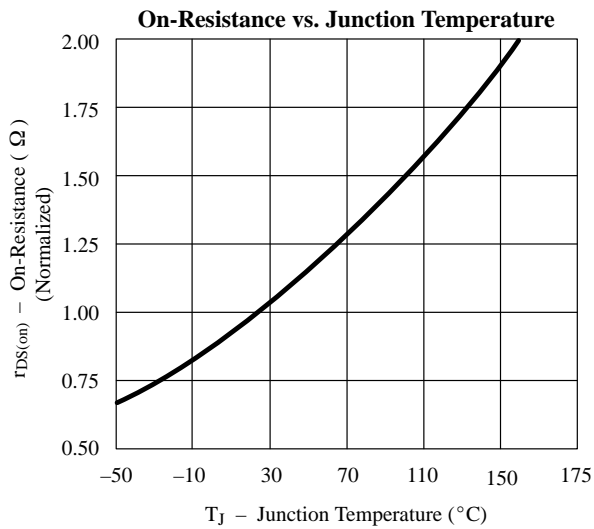
Notes:

- For design aid only; not subject to production testing.
- Pulse test; pulse width $\leq 300\ \mu\text{s}$, duty cycle $\leq 2\%$.
- Independent of operating temperature.

Typical Characteristics (25°C Unless Otherwise Noted)



Typical Characteristics (25°C Unless Otherwise Noted)



Thermal Ratings (Surface Mounted on PC Board)

