

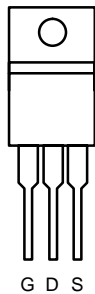


P-Channel 60-V (D-S), 175°C MOSFET

| PRODUCT SUMMARY | | |
|-------------------|---------------------------|------------------|
| $V_{(BR)DSS}$ (V) | $r_{DS(on)}$ (Ω) | I_D (A) |
| -60 | 0.020 | -65 ^a |

175°C Rated
Maximum Junction Temperature
TrenchFET®
Power MOSFETs

TO-220AB

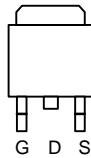


Top View

SUP65P06-20

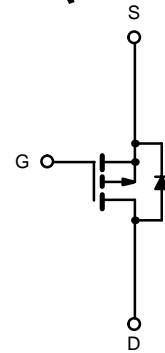
DRAIN connected to TAB

TO-263



Top View

SUB65P06-20



P-Channel MOSFET

| ABSOLUTE MAXIMUM RATINGS ($T_C = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED) | | | | |
|---|---|----------------|------------------|------------------|
| Parameter | | Symbol | Limit | Unit |
| Gate-Source Voltage | | V_{GS} | ± 20 | V |
| Continuous Drain Current ($T_J = 175^\circ\text{C}$) | $T_C = 25^\circ\text{C}$ | I_D | -65 ^a | A |
| | $T_C = 125^\circ\text{C}$ | | -39 | |
| Pulsed Drain Current | | I_{DM} | -200 | |
| Avalanche Current | | I_{AR} | -60 | |
| Repetitive Avalanche Energy ^b | $L = 0.1$ mH | E_{AR} | 180 | mJ |
| Power Dissipation | $T_C = 25^\circ\text{C}$ (TO-220AB and TO-263) | P_D | 250 ^d | W |
| | $T_A = 125^\circ\text{C}$ (TO-263) ^c | | 3.7 | |
| Operating Junction and Storage Temperature Range | | T_J, T_{stg} | -55 to 175 | $^\circ\text{C}$ |

| THERMAL RESISTANCE RATINGS | | | | |
|----------------------------|---------------------------------|------------|-------|---------------------------|
| Parameter | | Symbol | Limit | Unit |
| Junction-to-Ambient | PCB Mount (TO-263) ^c | R_{thJA} | 40 | $^\circ\text{C}/\text{W}$ |
| | Free Air (TO-220AB) | R_{thJA} | 62.5 | |
| Junction-to-Case | | R_{thJC} | 0.6 | |

Notes:

- a. Package limited.
- b. Duty cycle $\leq 1\%$.
- c. When mounted on 1" square PCB (FR-4 material).
- d. See SOA curve for voltage derating.

For SPICE model information via the Worldwide Web: <http://www.vishay.com/www/product/spice.htm>



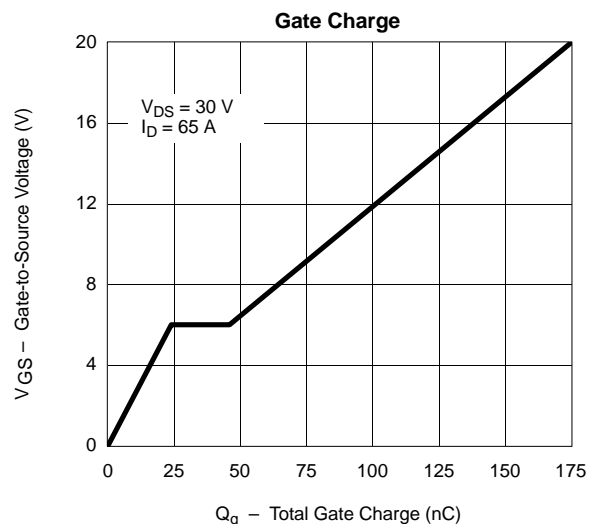
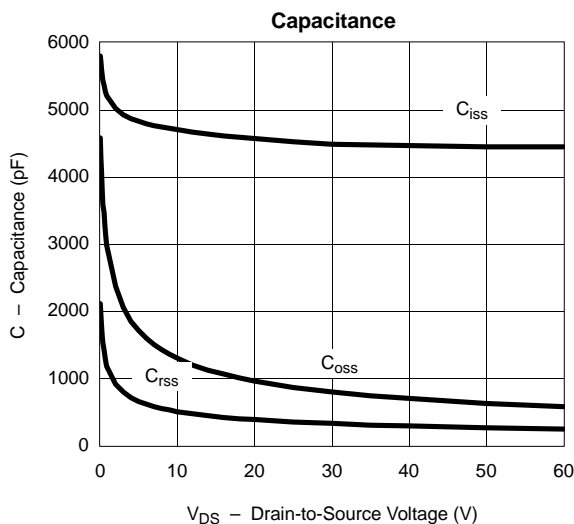
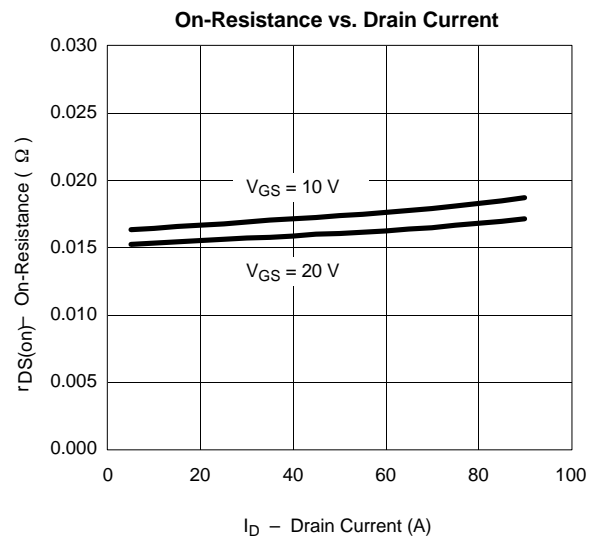
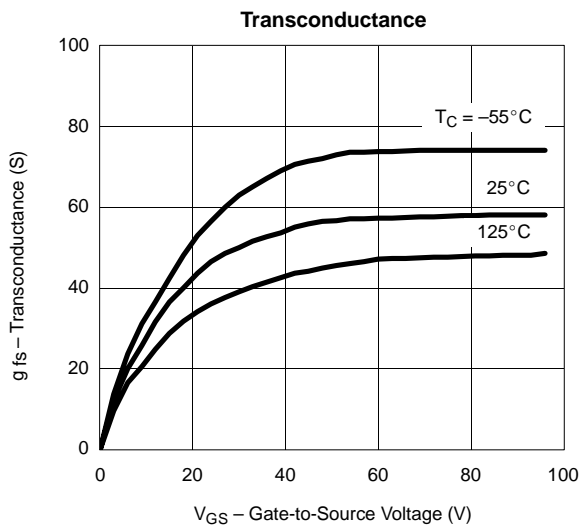
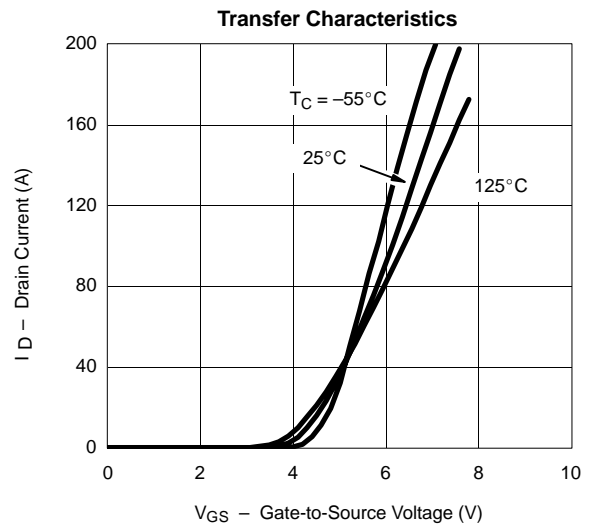
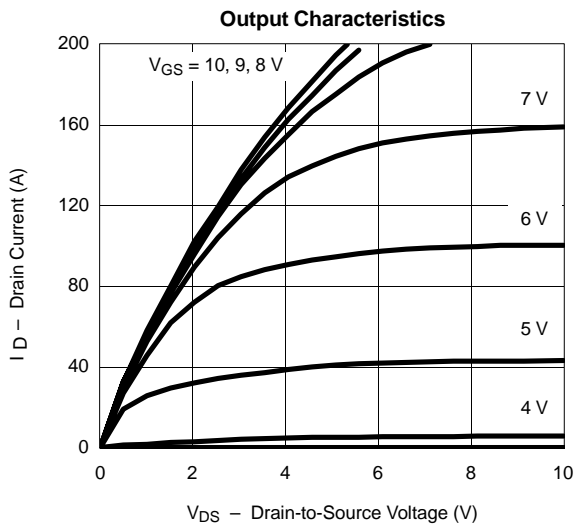
| SPECIFICATIONS (T _J = 25 °C UNLESS OTHERWISE NOTED) | | | | | | |
|---|----------------------|--|------|-------|-------|------|
| Parameter | Symbol | Test Condition | Min | Typ | Max | Unit |
| Static | | | | | | |
| Drain-Source Breakdown Voltage | V _{(BR)DSS} | V _{GS} = 0 V, I _D = -250 μA | -60 | | | V |
| Gate Threshold Voltage | V _{GS(th)} | V _{DS} = V _{GS} , I _D = -250 μA | -2.0 | -3.0 | -4.0 | |
| Gate-Body Leakage | I _{GSS} | V _{DS} = 0 V, V _{GS} = ±20 V | | | ±100 | nA |
| Zero Gate Voltage Drain Current | I _{DSS} | V _{DS} = -60 V, V _{GS} = 0 V | | | -1 | μA |
| | | V _{DS} = -60 V, V _{GS} = 0 V, T _J = 125 °C | | | -50 | |
| | | V _{DS} = -60 V, V _{GS} = 0 V, T _J = 175 °C | | | -150 | |
| On-State Drain Current ^a | I _{D(on)} | V _{DS} = -5 V, V _{GS} = -10 V | -120 | | | A |
| Drain-Source On-State Resistance ^a | r _{DS(on)} | V _{GS} = -10 V, I _D = -30 A | | 0.017 | 0.020 | Ω |
| | | V _{GS} = -10 V, I _D = -30 A, T _J = 125 °C | | | 0.033 | |
| | | V _{GS} = -10 V, I _D = -30 A, T _J = 175 °C | | | 0.042 | |
| Forward Transconductance ^a | g _{fs} | V _{DS} = -15 V, I _D = -30 A | 25 | | | S |
| Dynamic^b | | | | | | |
| Input Capacitance | C _{iss} | V _{GS} = 0 V, V _{DS} = -25 V, f = 1 MHz | | 4500 | | pF |
| Output Capacitance | C _{oss} | | | 870 | | |
| Reverse Transfer Capacitance | C _{rss} | | | 350 | | |
| Total Gate Charge ^c | Q _g | V _{DS} = -30 V, V _{GS} = -10 V, I _D = -65 A | | 85 | 120 | nC |
| Gate-Source Charge ^c | Q _{gs} | | | 24 | | |
| Gate-Drain Charge ^c | Q _{gd} | | | 22 | | |
| Turn-On Delay Time ^c | t _{d(on)} | V _{DD} = -30 V, R _L = 0.47 Ω I _D = -65 A, V _{GEN} = -10 V, R _G = 2.5 Ω | | 15 | 40 | ns |
| Rise Time ^c | t _r | | | 40 | 80 | |
| Turn-Off Delay Time ^c | t _{d(off)} | | | 65 | 120 | |
| Fall Time ^c | t _f | | | 30 | 60 | |
| Source-Drain Diode Ratings and Characteristics (T_C = 25 °C)^b | | | | | | |
| Continuous Current | I _s | | | | -65 | A |
| Pulsed Current | I _{SM} | | | | -200 | |
| Forward Voltage ^a | V _{SD} | I _F = -65 A, V _{GS} = 0 V | | -1.1 | -1.4 | V |
| Reverse Recovery Time | t _{rr} | I _F = -65 A, di/dt = 100 A/μs | | 70 | 120 | ns |
| Peak Reverse Recovery Current | I _{RM(REC)} | | | 7 | 9 | A |
| Reverse Recovery Charge | Q _{rr} | | | 0.245 | 0.54 | μC |

Notes:

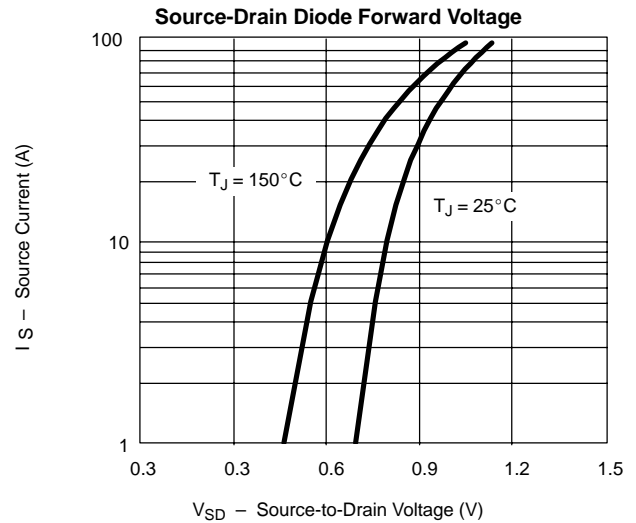
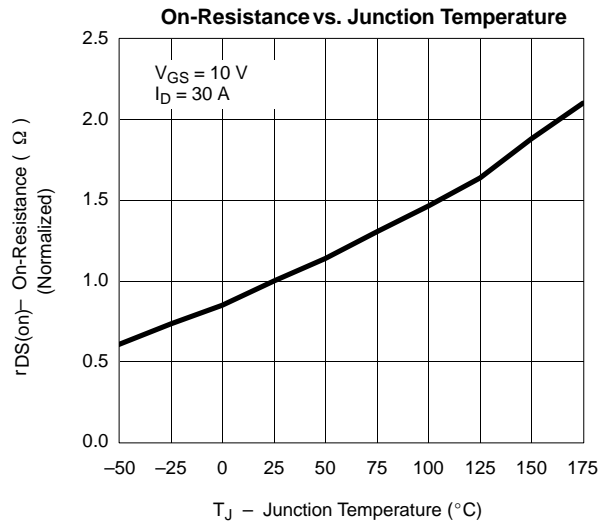
- a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.
- b. Guaranteed by design, not subject to production testing
- d. Independent of operating temperature.



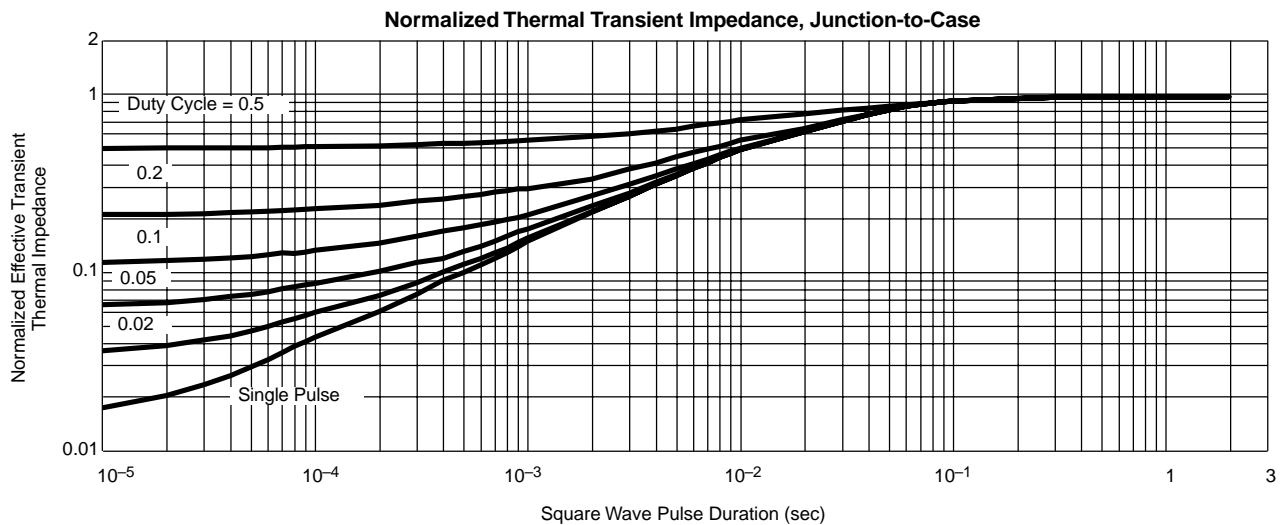
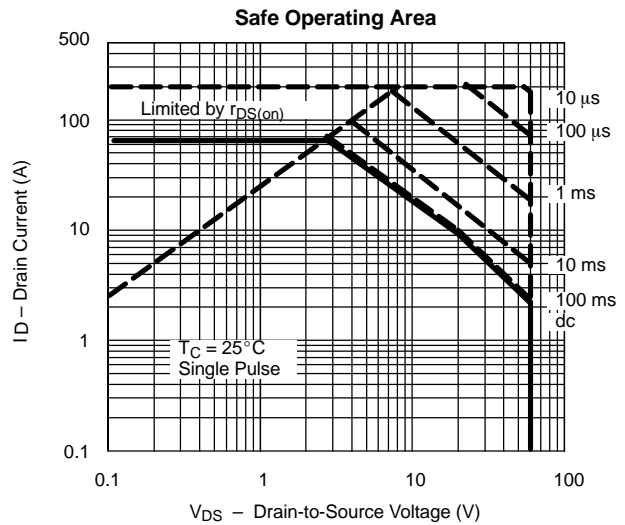
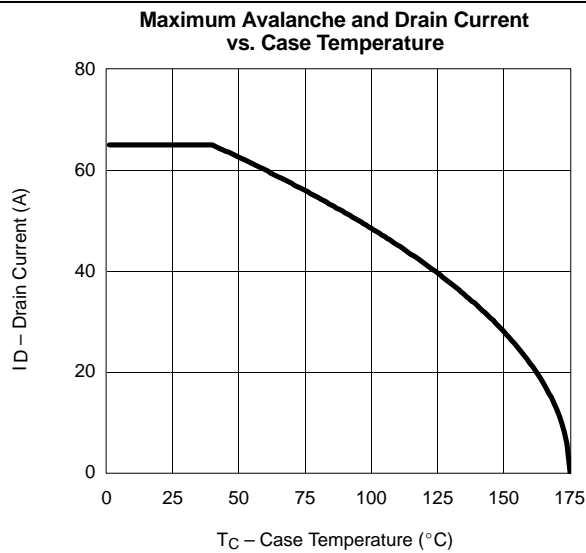
TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)



TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)



THERMAL RATINGS





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