

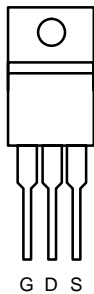


## P-Channel 60-V (D-S), 175°C MOSFET

PRODUCT SUMMARY		
$V_{(BR)DSS}$ (V)	$r_{DS(on)}$ ( $\Omega$ )	$I_D$ (A)
-60	0.020	-65 <sup>a</sup>

**175°C Rated**  
Maximum Junction Temperature  
**TrenchFET®**  
Power MOSFETs

TO-220AB

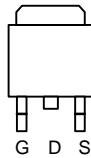


Top View

SUP65P06-20

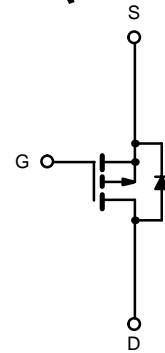
DRAIN connected to TAB

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		$V_{GS}$	$\pm 20$	V
Continuous Drain Current ( $T_J = 175^\circ\text{C}$ )	$T_C = 25^\circ\text{C}$	$I_D$	-65 <sup>a</sup>	A
	$T_C = 125^\circ\text{C}$		-39	
Pulsed Drain Current		$I_{DM}$	-200	
Avalanche Current		$I_{AR}$	-60	
Repetitive Avalanche Energy <sup>b</sup>	$L = 0.1$ mH	$E_{AR}$	180	mJ
Power Dissipation	$T_C = 25^\circ\text{C}$ (TO-220AB and TO-263)	$P_D$	250 <sup>d</sup>	W
	$T_A = 125^\circ\text{C}$ (TO-263) <sup>c</sup>		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) <sup>c</sup>	$R_{thJA}$	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>



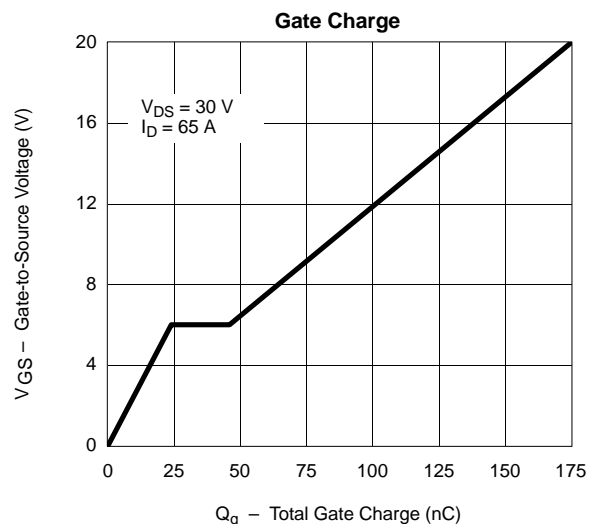
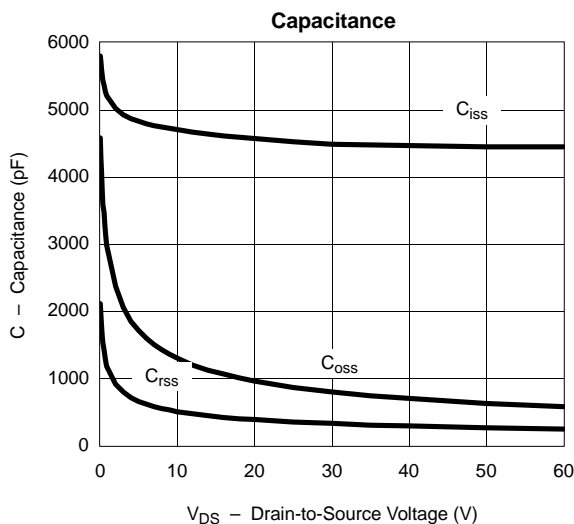
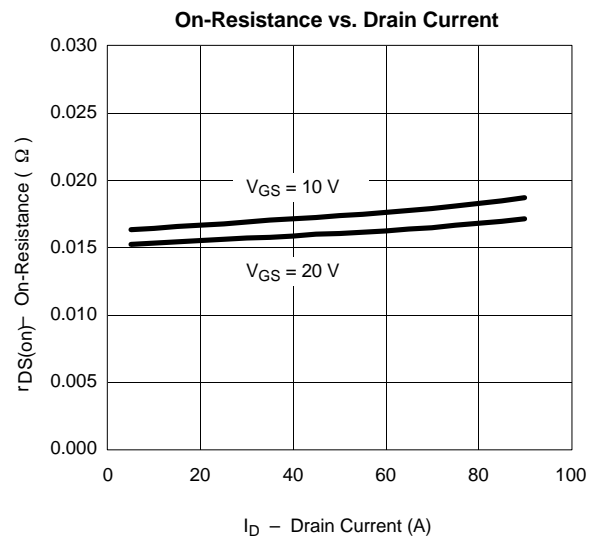
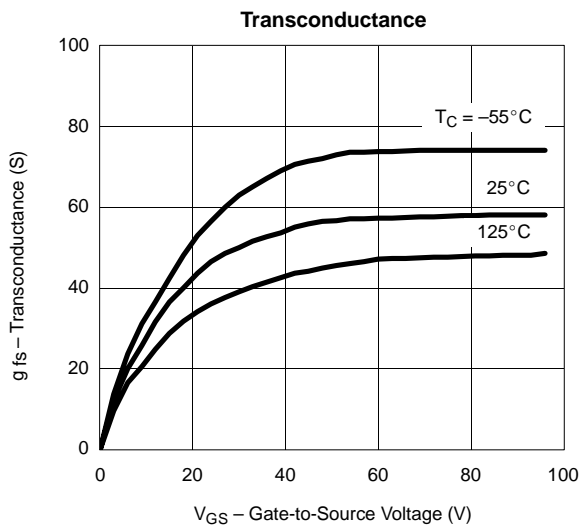
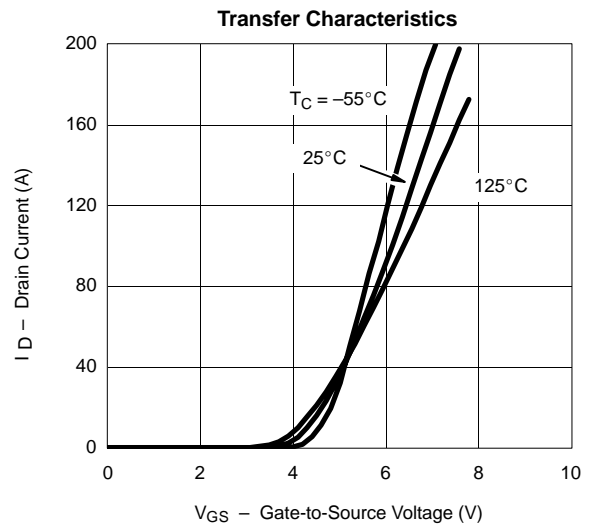
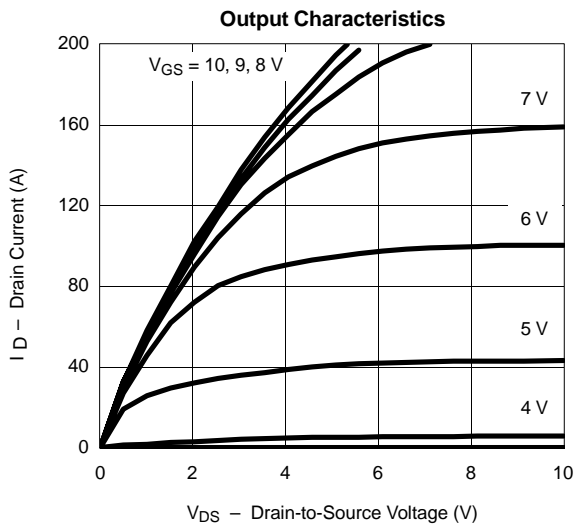
SPECIFICATIONS (T <sub>J</sub> = 25 °C UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
<b>Static</b>						
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0 V, I <sub>D</sub> = -250 μA	-60			V
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub>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

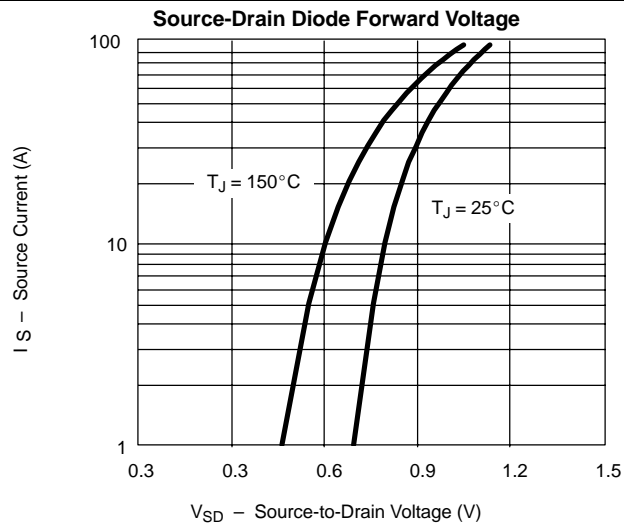
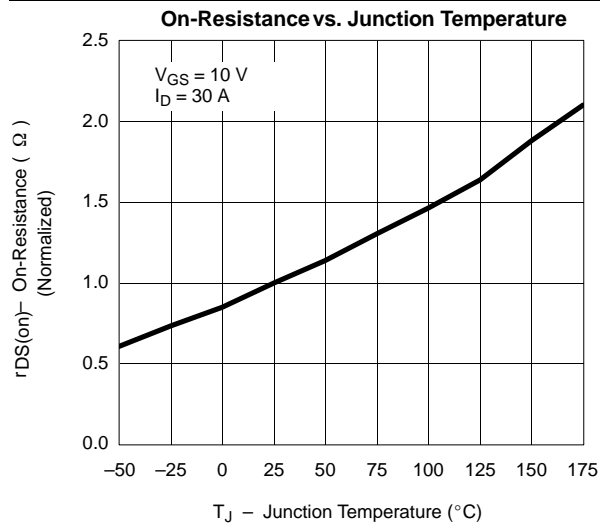


**TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)**





**TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)**



**THERMAL RATINGS**

