

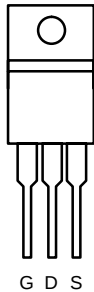


P-Channel 60-V (D-S), 175°C MOSFET

PRODUCT SUMMARY

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

TO-220AB

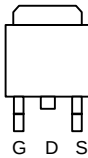


Top View

SUP65P06-20

DRAIN connected to TAB

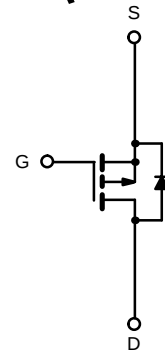
TO-263



Top View

SUB65P06-20

175°C Rated
Maximum Junction Temperature
TrenchFET®
Power MOSFETs



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		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	$^\circ\text{C/W}$
	Free Air (TO-220AB)	R_{thJA}	62.5	
Junction-to-Case		R_{thJC}	0.6	

Notes:

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

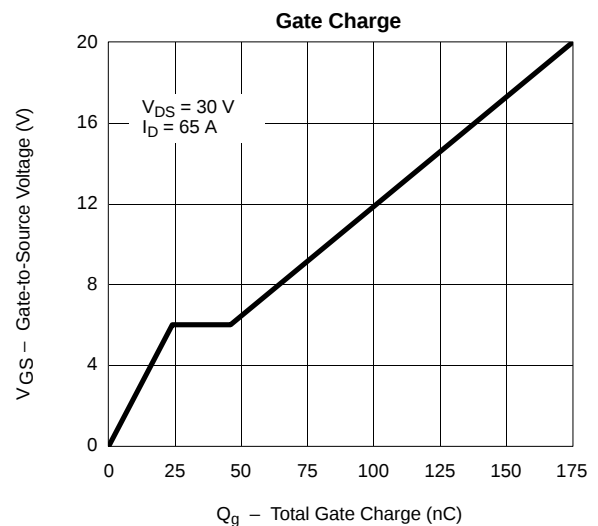
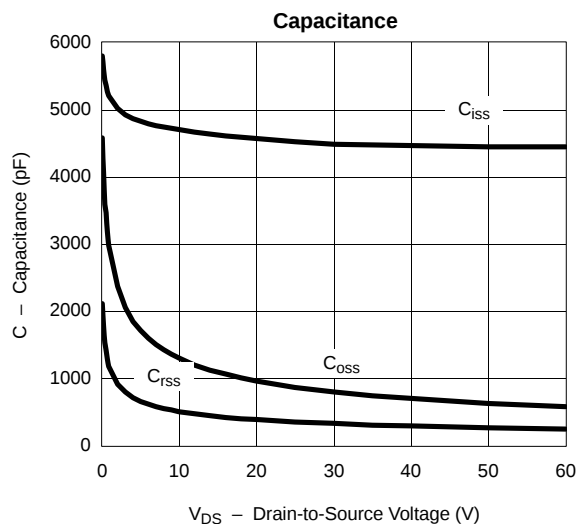
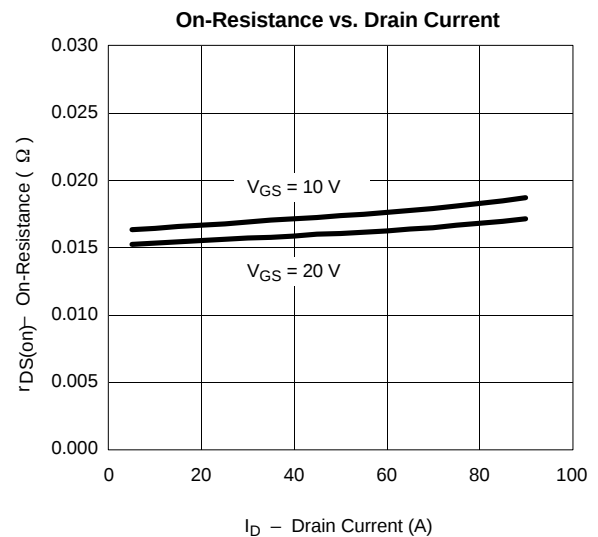
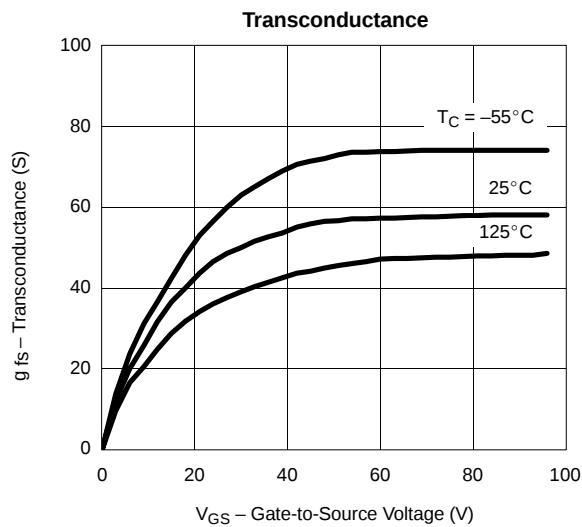
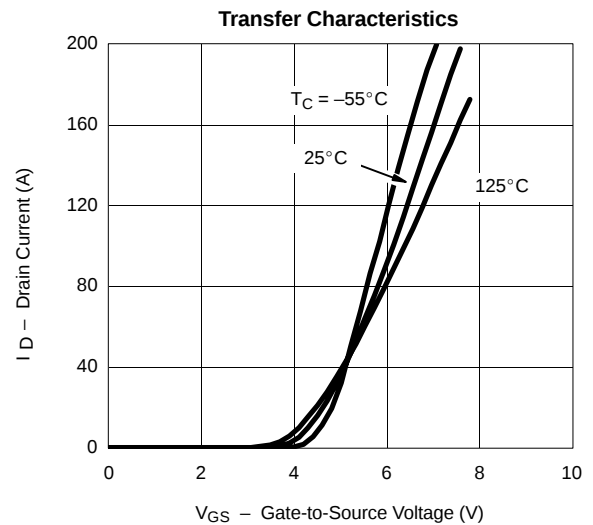
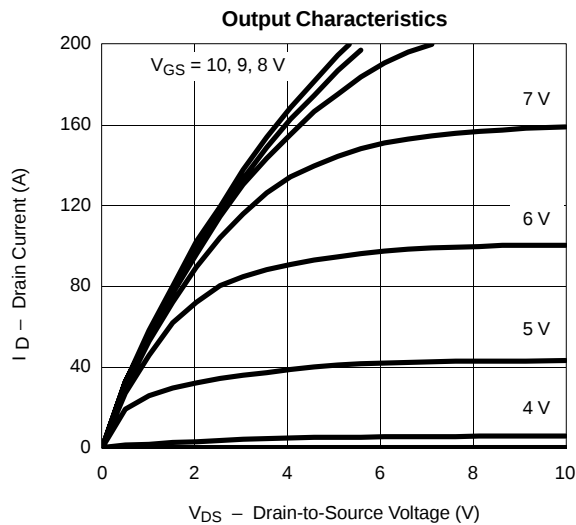
For SPICE model information via the Worldwide Web: <http://www.vishay.com/www/product/spice.htm>

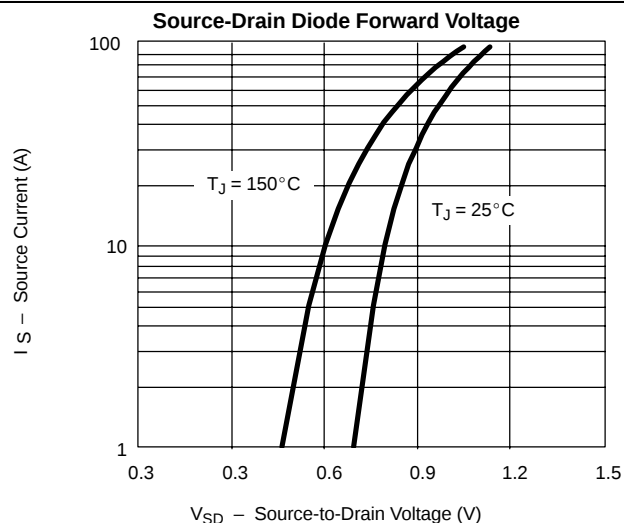
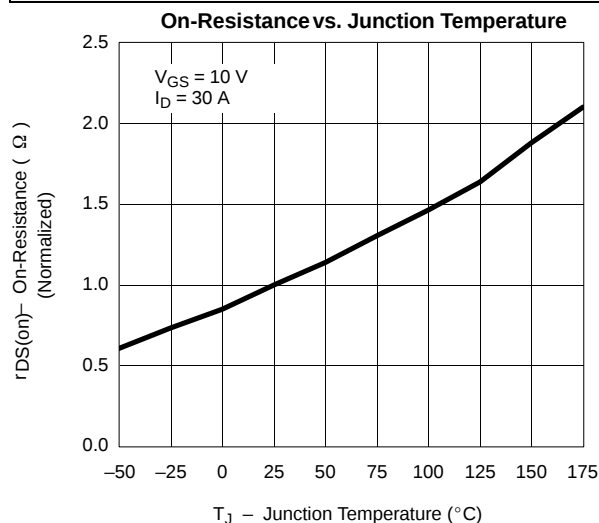
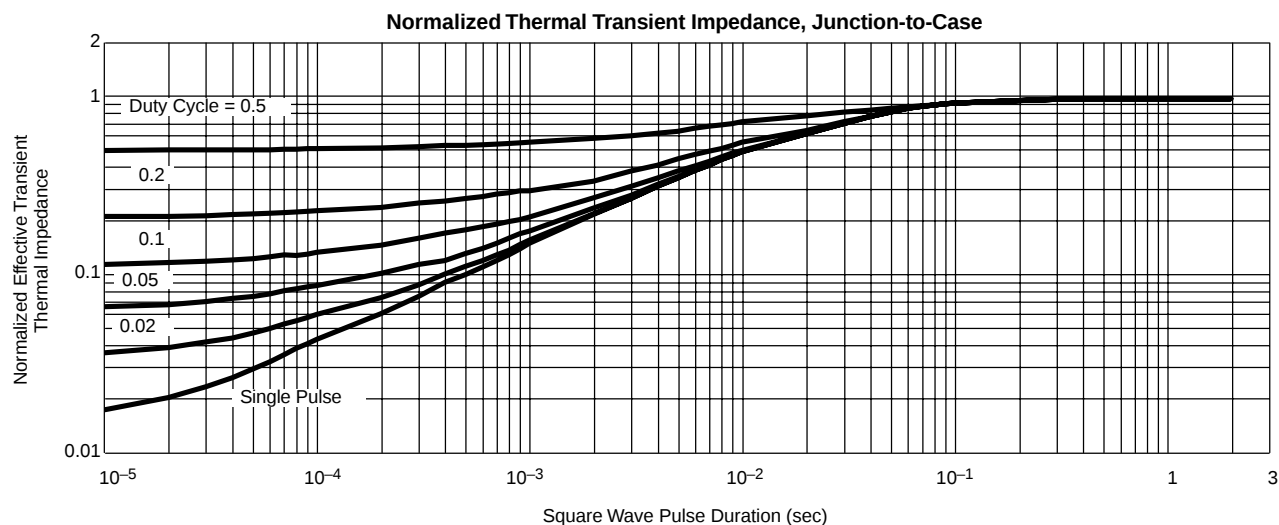
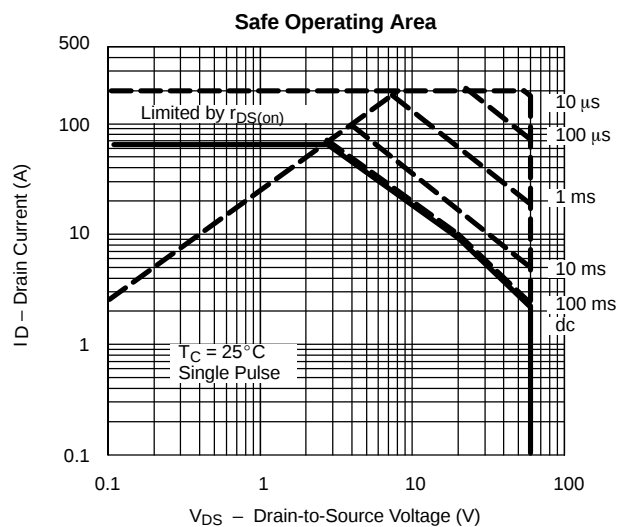
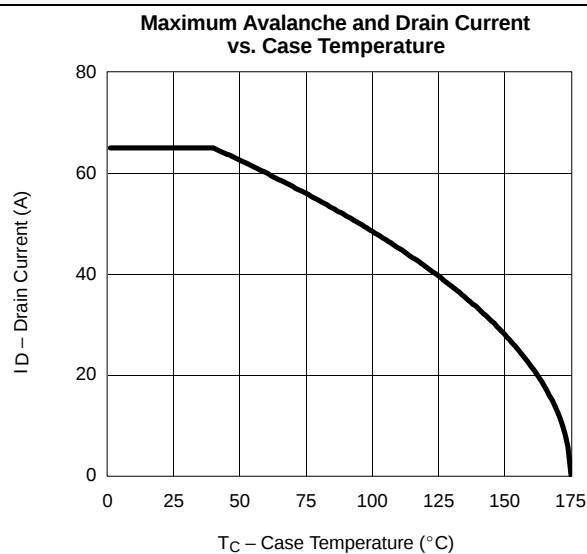


SPECIFICATIONS (T _J = 25 °C UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} = 0 V, I _D = −250 μA	−60			V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = −250 μA	−2.0	−3.0	−4.0	
Gate-Body Leakage	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		
Reversen 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

Notes:

- a. Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.
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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