

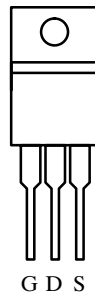
P-Channel Enhancement-Mode Transistors

175°C Maximum Junction Temperature

Product Summary

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

TO-220AB

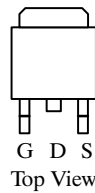


Top View

SUP65P06-20

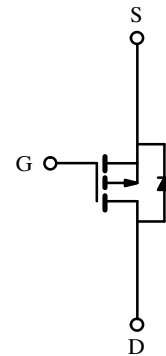
DRAIN connected to TAB

TO-263



Top View

SUB65P06-20



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	187 ^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}	0.8	

Notes:

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

SUP/SUB65P06-20

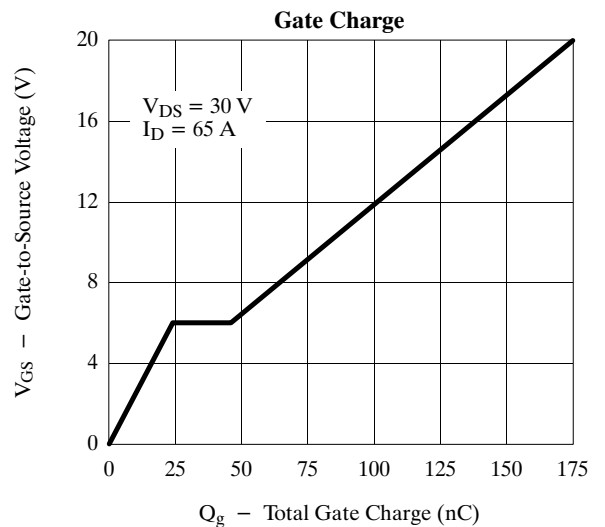
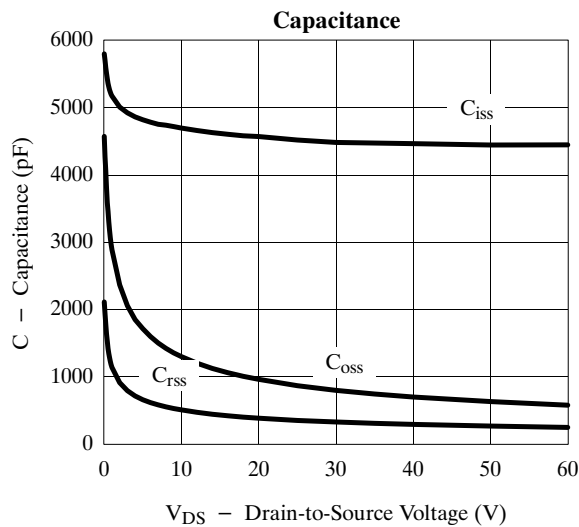
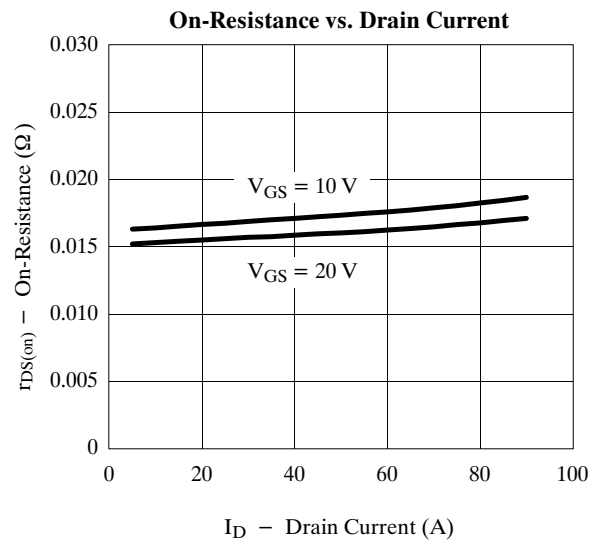
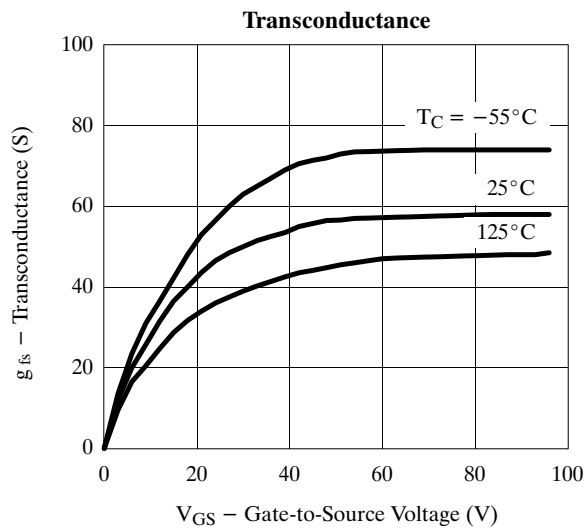
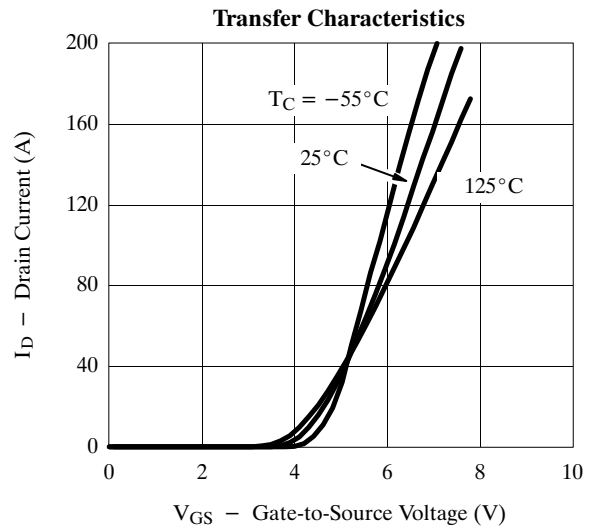
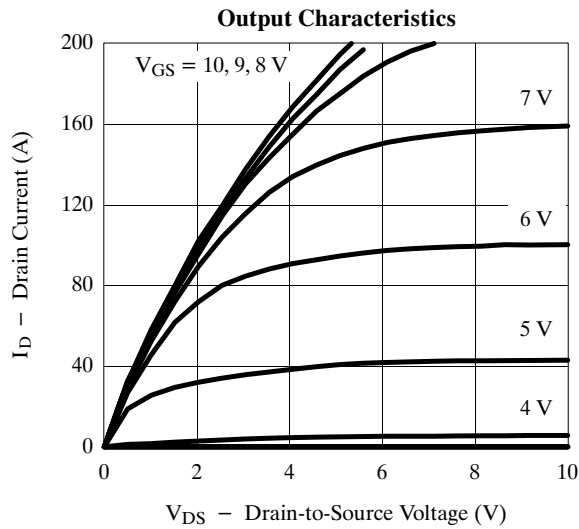
Specifications ($T_J = 25^\circ\text{C}$ Unless Otherwise Noted)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0\text{ V}, I_D = -250\ \mu\text{A}$	-60			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\ \mu\text{A}$	-2.0	-3.0	-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}	$V_{DS} = -60\text{ V}, V_{GS} = 0\text{ V}$			-1	μA
		$V_{DS} = -60\text{ V}, V_{GS} = 0\text{ V}, T_J = 125^\circ\text{C}$			-50	
		$V_{DS} = -60\text{ V}, V_{GS} = 0\text{ V}, T_J = 175^\circ\text{C}$			-150	
On-State Drain Current ^{bb}	$I_{D(on)}$	$V_{DS} = -5\text{ V}, V_{GS} = -10\text{ V}$	-120			A
Drain-Source On-State Resistance ^b	$r_{DS(on)}$	$V_{GS} = -10\text{ V}, I_D = -30\text{ A}$		0.017	0.020	Ω
		$V_{GS} = -10\text{ V}, I_D = -30\text{ A}, T_J = 125^\circ\text{C}$			0.033	
		$V_{GS} = -10\text{ V}, I_D = -30\text{ A}, T_J = 175^\circ\text{C}$			0.042	
Forward Transconductance ^b	g_{fs}	$V_{DS} = -15\text{ V}, I_D = -30\text{ A}$	25			S
Dynamic^a						
Input Capacitance	C_{iss}	$V_{GS} = 0\text{ V}, V_{DS} = -25\text{ V}, f = 1\text{ MHz}$		4500		pF
Output Capacitance	C_{oss}			870		
Reverse Transfer Capacitance	C_{rss}			350		
Total Gate Charge ^c	Q_g	$V_{DS} = -30\text{ V}, V_{GS} = -10\text{ V}, I_D = -65\text{ A}$		85	120	nC
Gate-Source Charge ^c	Q_{gs}			24		
Gate-Drain Charge ^c	Q_{gd}			22		
Turn-On Delay Time ^c	$t_{d(on)}$	$V_{DD} = -30\text{ V}, R_L = 0.47\ \Omega$ $I_D = -65\text{ A}, V_{GEN} = -10\text{ V}, R_G = 2.5\ \Omega$		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 ($T_C = 25^\circ\text{C}$)^a						
Continuous Current	I_S				-65	A
Pulsed Current	I_{SM}				-200	
Forward Voltage ^b	V_{SD}	$I_F = -65\text{ A}, V_{GS} = 0\text{ V}$		-1.1	-1.4	V
Reverse Recovery Time	t_{rr}	$I_F = -65\text{ A}, di/dt = 100\text{ A}/\mu\text{s}$		70	120	ns
Peak Reverse Recovery Current	$I_{RM(REC)}$			7	9	A
Reverse Recovery Charge	Q_{rr}			0.245	0.54	μC

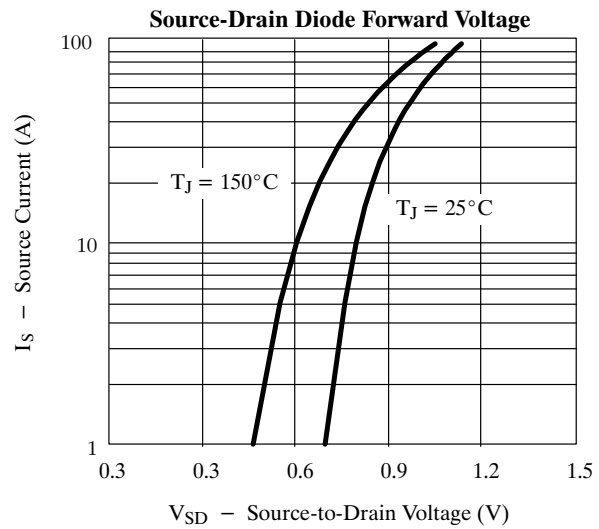
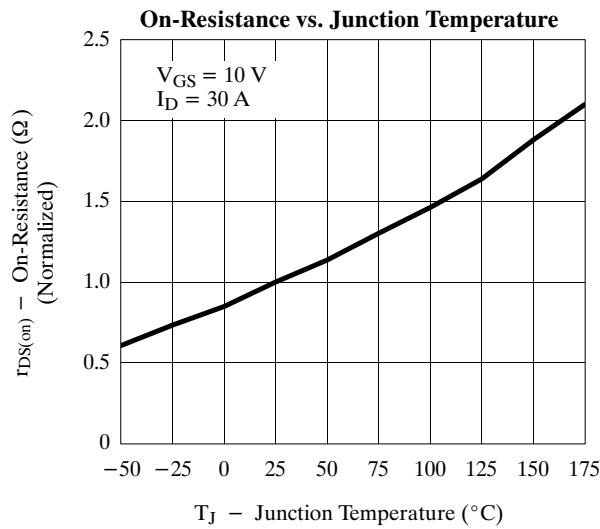
Notes:

- Guaranteed by design, 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 Noted)



Typical Characteristics (25°C Unless Otherwise Noted)



Thermal Ratings

