

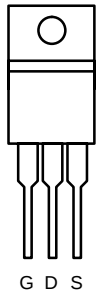


P-Channel 30-V (D-S) 175°C MOSFET

PRODUCT SUMMARY

V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A) ^a
-30	0.007 @ $V_{GS} = -10$ V	± 75
	0.010 @ $V_{GS} = -4.5$ V	± 75

TO-220AB

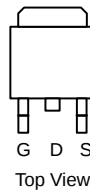


Top View

SUP75P03-07

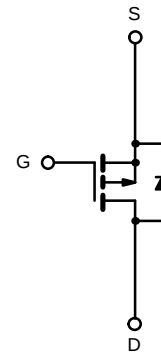
DRAIN connected to TAB

TO-263



Top View

SUB75P03-07



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	-75 ^a	A
	$T_C = 125^\circ\text{C}$		-65	
Pulsed Drain Current		I_{DM}	-240	
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	187 ^d	W
	$T_A = 25^\circ\text{C}$ (TO-263) ^c		3.75	
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:

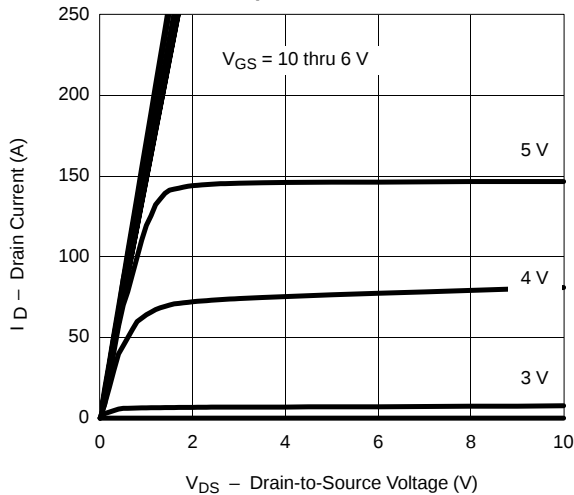
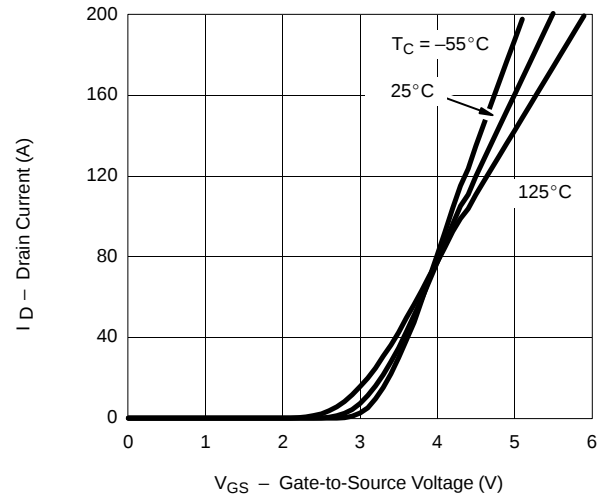
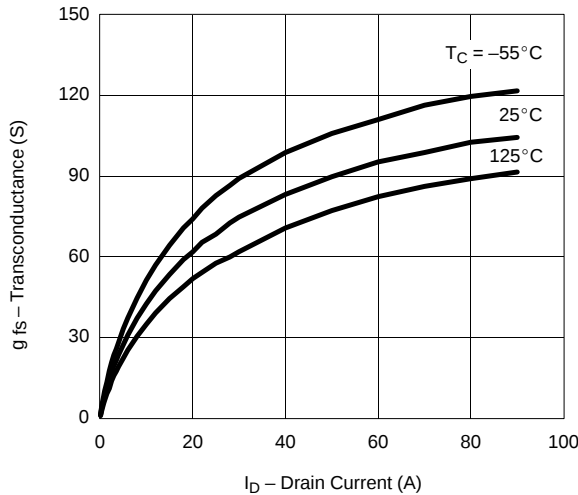
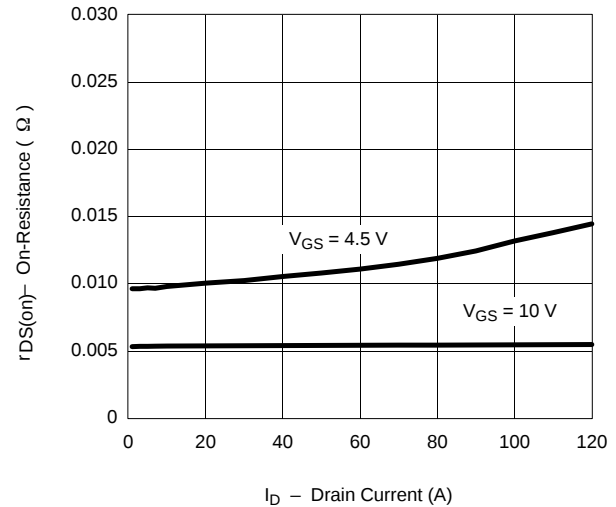
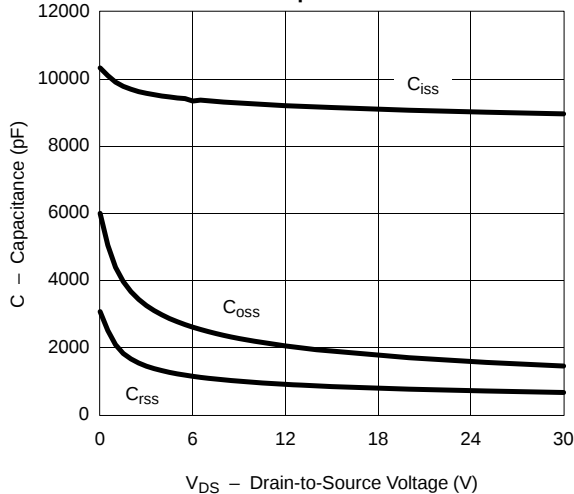
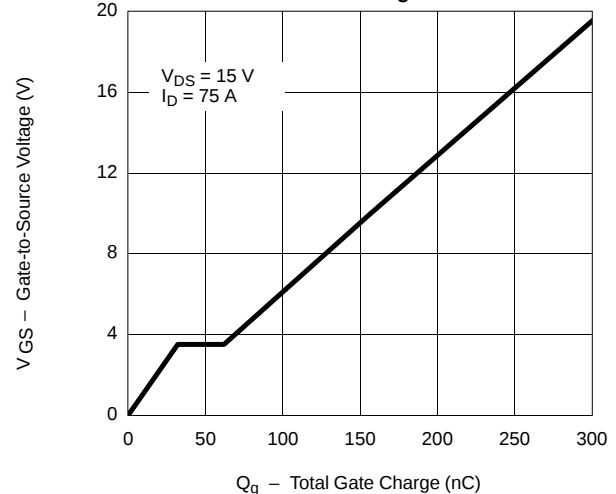
- Package limited.
- Duty cycle $\leq 1\%$.
- When mounted on 1" square PCB (FR-4 material).
- See SOA curve for voltage derating.

**SPECIFICATIONS (T_J = 25 °C UNLESS OTHERWISE NOTED)**

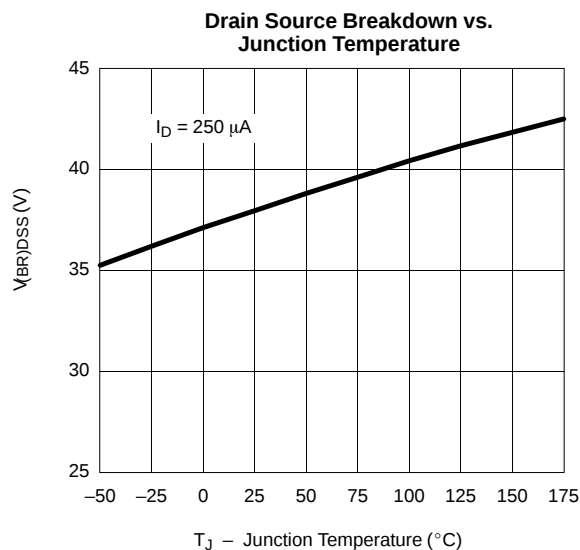
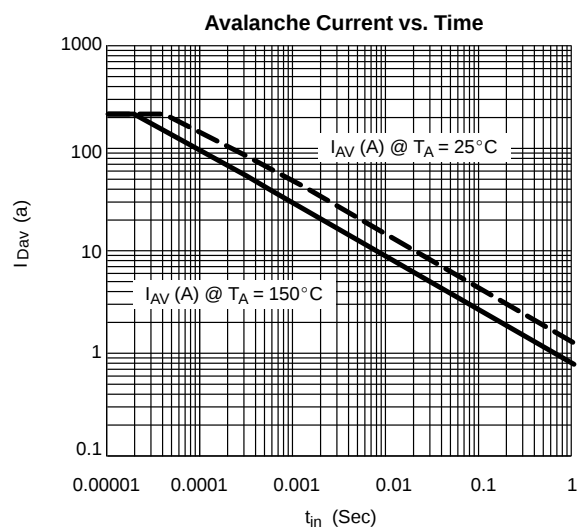
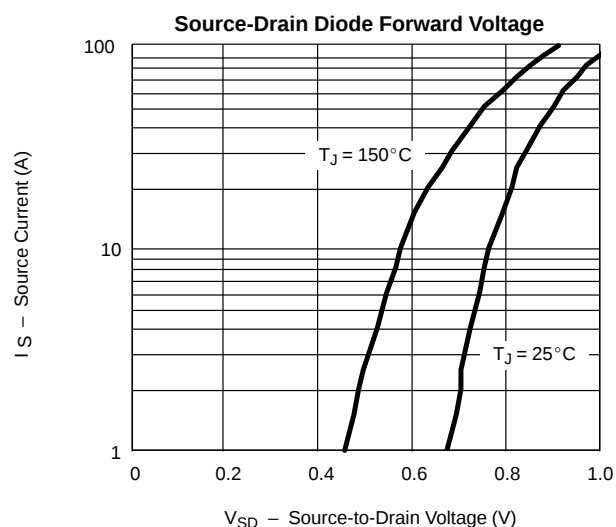
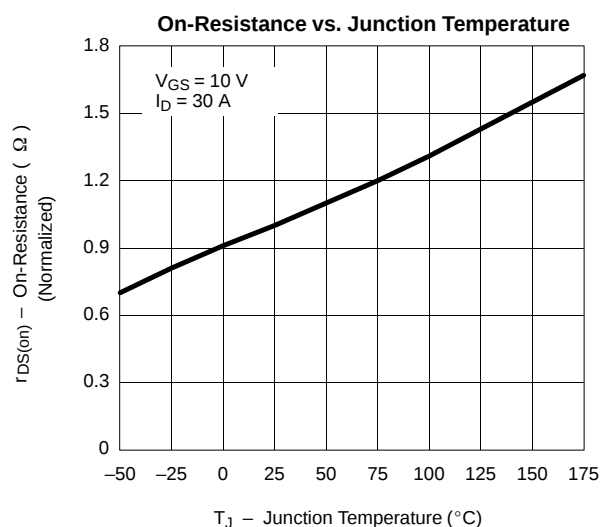
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} = 0 V, I _D = −250 μA	−30			V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = −250 μA	−1		−3	
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ± 20 V			± 100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = −30 V, V _{GS} = 0 V			−1	μA
		V _{DS} = −30 V, V _{GS} = 0 V, T _J = 125 °C			−50	
		V _{DS} = −30 V, V _{GS} = 0 V, T _J = 175 °C			−250	
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		0.0055	0.007	Ω
		V _{GS} = −10 V, I _D = −30 A, T _J = 125 °C			0.010	
		V _{GS} = −10 V, I _D = −30 A, T _J = 175 °C			0.013	
		V _{GS} = −4.5 V, I _D = −20 A		0.008	0.010	Ω
Forward Transconductance ^a	g _{fs}	V _{DS} = −15 V, I _D = −75 A	20			S
Dynamic ^b						
Input Capacitance	C _{iss}	V _{GS} = 0 V, V _{DS} = −25 V, f = 1 MHz		9000		pF
Output Capacitance	C _{oss}			1565		
Reverse Transfer Capacitance	C _{rss}			715		
Total Gate Charge ^c	Q _g	V _{DS} = −15 V, V _{GS} = −10 V, I _D = −75 A		160	240	nC
Gate-Source Charge ^c	Q _{gs}			32		
Gate-Drain Charge ^c	Q _{gd}			30		
Turn-On Delay Time ^c	t _{d(on)}	V _{DD} = −15 V, R _L = 0.2 Ω I _D ≈ −75 A, V _{GEN} = −10 V, R _G = 2.5 Ω		25	40	ns
Rise Time ^c	t _r			225	360	
Turn-Off Delay Time ^c	t _{d(off)}			150	240	
Fall Time ^c	t _f			210	340	
Source-Drain Diode Ratings and Characteristics (T _C = 25 °C) ^b						
Continuous Current	I _S				−75	A
Pulsed Current	I _{SM}				−240	
Forward Voltage ^a	V _{SD}	I _F = −75 A, V _{GS} = 0 V		−1.2	−1.5	V
Reverse Recovery Time	t _{rr}	I _F = −75 A, di/dt = 100 A/μs		55	100	ns
Peak Reverse Recovery Current	I _{RM(REC)}			2.5	5	A
Reverse Recovery Charge	Q _{rr}			0.07	0.25	μC

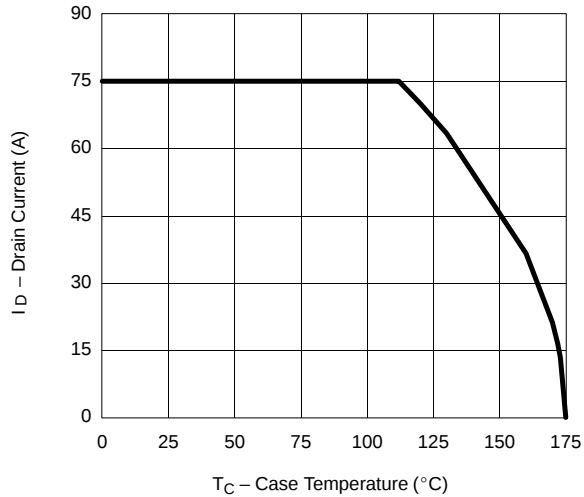
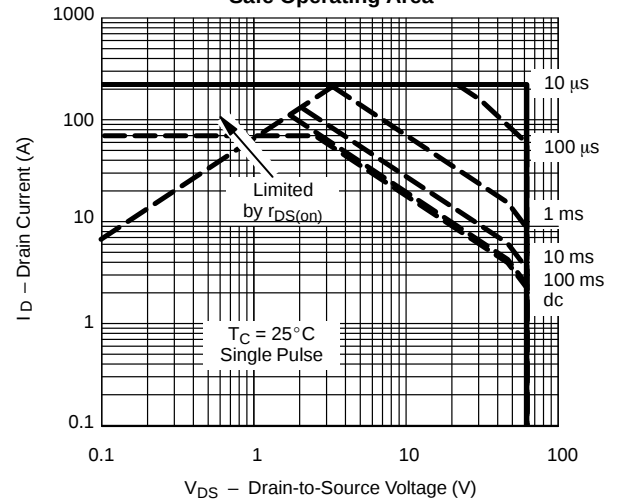
Notes:

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

**TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)****Output Characteristics****Transfer Characteristics****Transconductance****On-Resistance vs. Drain Current****Capacitance****Gate Charge**

TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)



**THERMAL RATINGS****Maximum Avalanche and Drain Current
vs. Case Temperature****Safe Operating Area****Normalized Thermal Transient Impedance, Junction-to-Case**