

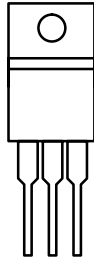


## P-Channel 55-V (D-S), 175°C MOSFET

PRODUCT SUMMARY		
$V_{(BR)DSS}$ (V)	$r_{DS(on)}$ ( $\Omega$ )	$I_D$ (A)
-55	0.008	-75 <sup>a</sup>

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

TO-220AB



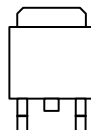
G D S

Top View

SUP75P05-08

DRAIN connected to TAB

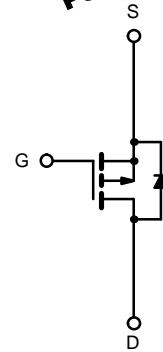
TO-263



G D S

Top View

SUB75P05-08



P-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS ( $T_C = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)				
Parameter	Symbol	Limit	Unit	
Drain-Source Voltage	$V_{DS}$	-55	V	
Gate-Source Voltage	$V_{GS}$	$\pm 20$		
Continuous Drain Current ( $T_J = 175^\circ\text{C}$ )	$I_D$	$T_C = 25^\circ\text{C}$	-75 <sup>a</sup>	A
		$T_C = 150^\circ\text{C}$	-47	
Pulsed Drain Current	$I_{DM}$	-240		
Avalanche Current	$I_{AR}$	-75		
Repetitive Avalanche Energy <sup>b</sup>	$E_{AR}$	L = 0.1 mH	280	mJ
Power Dissipation			$T_C = 25^\circ\text{C}$ (TO-220AB and TO-263)	250 <sup>d</sup>
	$T_A = 125^\circ\text{C}$ (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	$R_{thJA}$	PCB Mount (TO-263) <sup>e</sup>	40	$^\circ\text{C}/\text{W}$
		Free Air (TO-220AB)	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.siliconix.com/www/product/spice.htm>



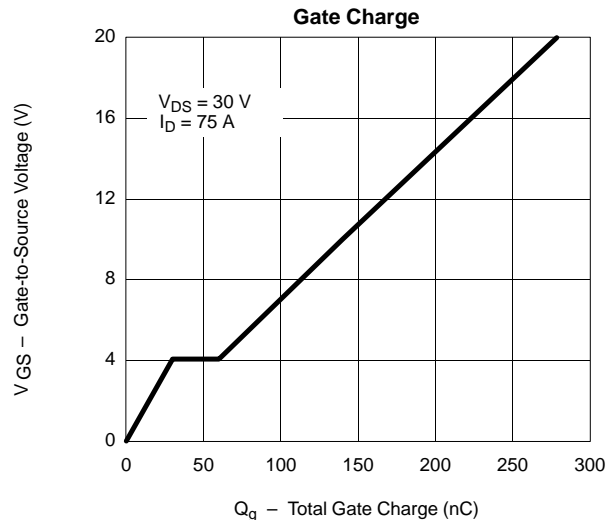
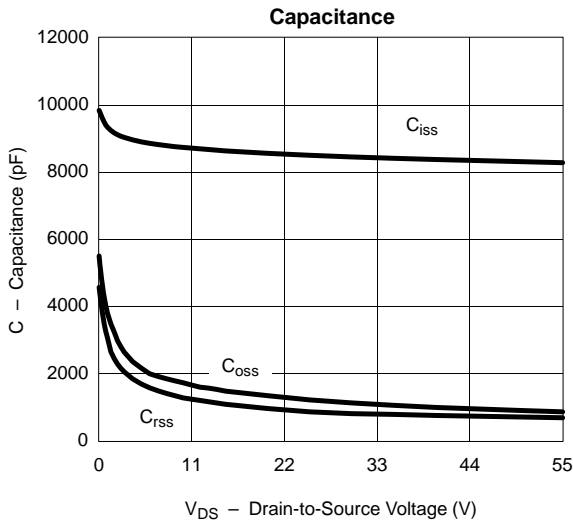
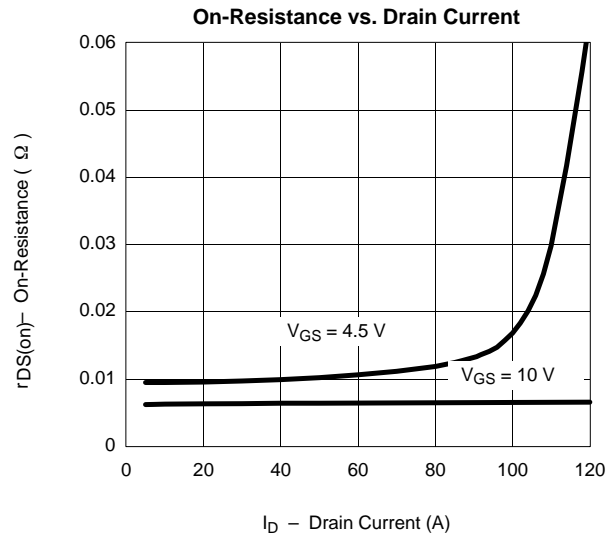
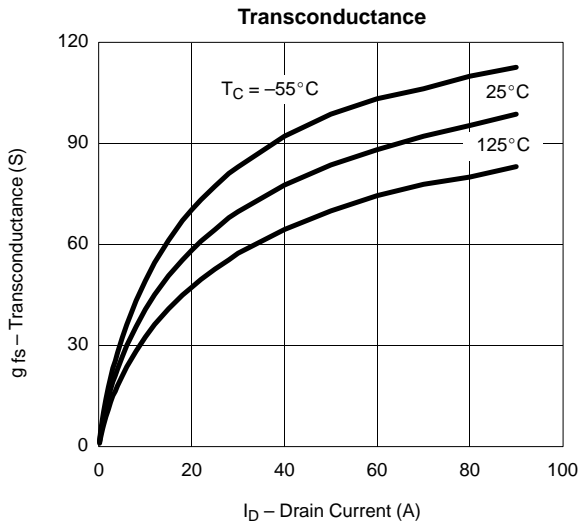
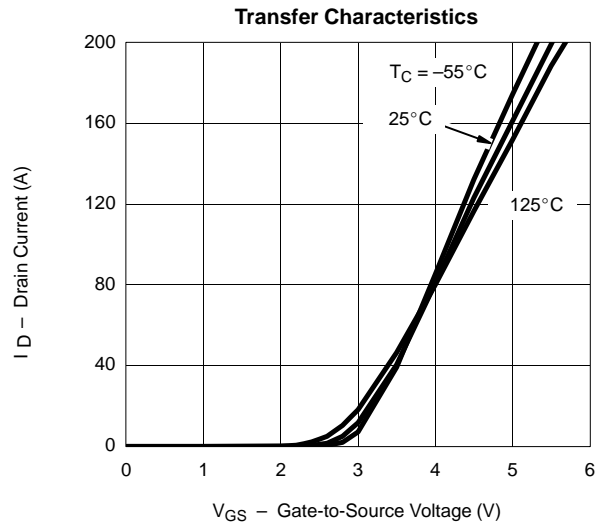
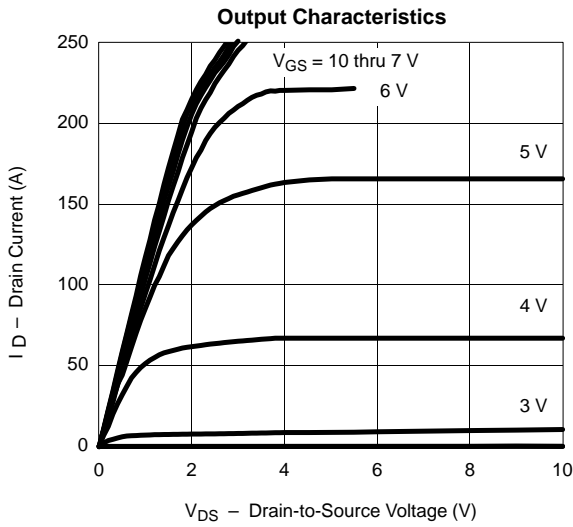
SPECIFICATIONS (T <sub>J</sub> = 25 °C UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
<b>Static</b>						
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0 V, I <sub>D</sub> = -250 μA	-55			V
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = -250 μA	-1	-2	-3	
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> = -44 V, V <sub>GS</sub> = 0 V			-1	μA
		V <sub>DS</sub> = -44 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 125 °C			-50	
		V <sub>DS</sub> = -44 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 175 °C			-700	
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			0.008	Ω
		V <sub>GS</sub> = -4.5 V, I <sub>D</sub> = -20 A			0.013	
		V <sub>GS</sub> = -10 V, I <sub>D</sub> = -30 A, T <sub>J</sub> = 125 °C			0.014	
		V <sub>GS</sub> = -10 V, I <sub>D</sub> = -30 A, T <sub>J</sub> = 175 °C			0.016	
Forward Transconductance <sup>a</sup>	g <sub>fs</sub>	V <sub>DS</sub> = -15 V, I <sub>D</sub> = -30 A		75		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		8500		pF
Output Capacitance	C <sub>oss</sub>			1220		
Reverse Transfer Capacitance	C <sub>rss</sub>			915		
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> = -75 A		140	225	nC
Gate-Source Charge <sup>c</sup>	Q <sub>gs</sub>			30		
Gate-Drain Charge <sup>c</sup>	Q <sub>gd</sub>			30		
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> = -75 A, V <sub>GEN</sub> = -10 V, R <sub>G</sub> = 2.5 Ω		13	20	ns
Rise Time <sup>c</sup>	t <sub>r</sub>			140	225	
Turn-Off Delay Time <sup>c</sup>	t <sub>d(off)</sub>			115	185	
Fall Time <sup>c</sup>	t <sub>f</sub>			175	300	
<b>Source-Drain Diode Ratings and Characteristics (T<sub>C</sub> = 25 °C)<sup>b</sup></b>						
Continuous Current	I <sub>s</sub>				-75	A
Pulsed Current	I <sub>SM</sub>				-240	
Forward Voltage <sup>a</sup>	V <sub>SD</sub>	I <sub>F</sub> = -75 A, V <sub>GS</sub> = 0 V		-1.1	-1.3	V
Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> = -75 A, di/dt = 100 A/μs		60	120	ns
Peak Reverse Recovery Current	I <sub>RM(REC)</sub>			2.2	3.5	A
Reverse Recovery Charge	Q <sub>rr</sub>			0.176	0.21	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.

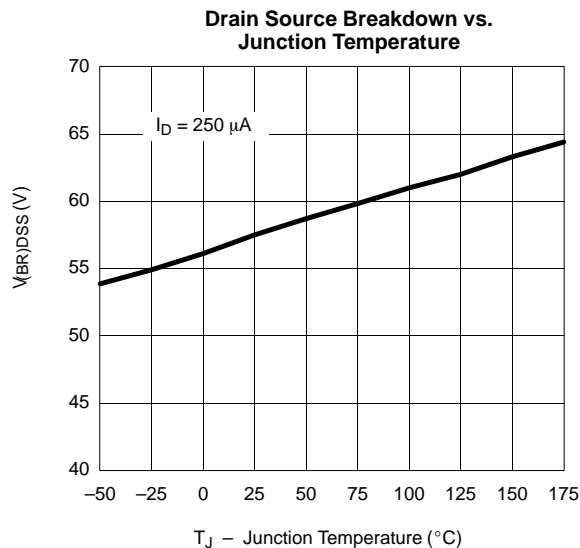
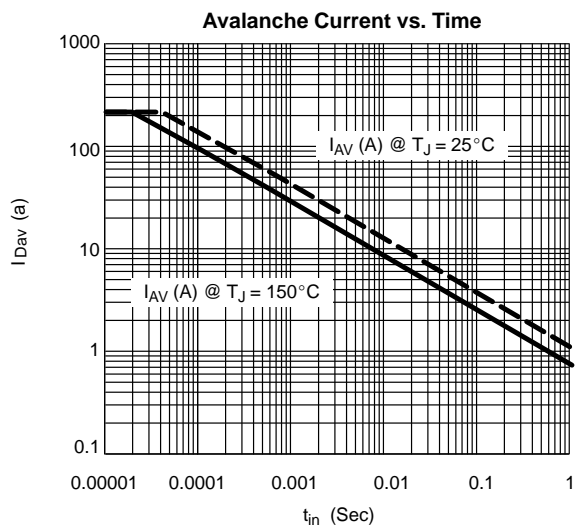
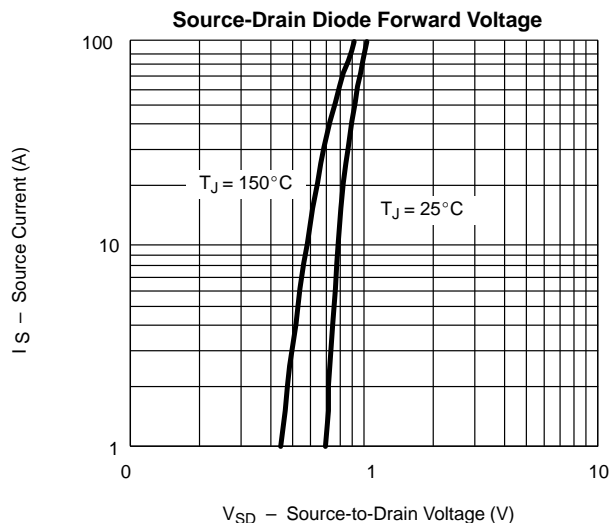
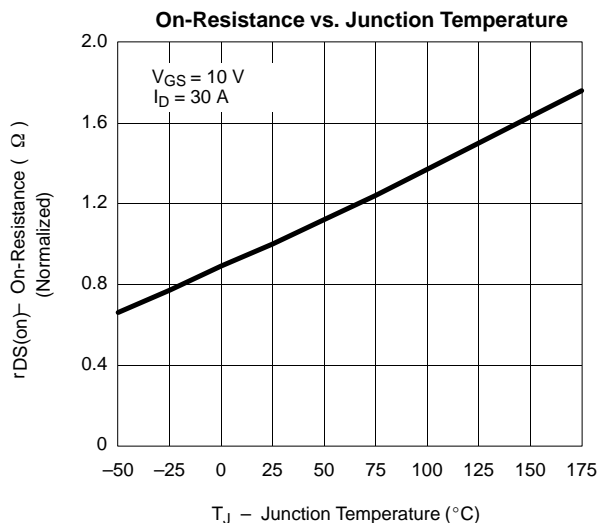


**TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)**





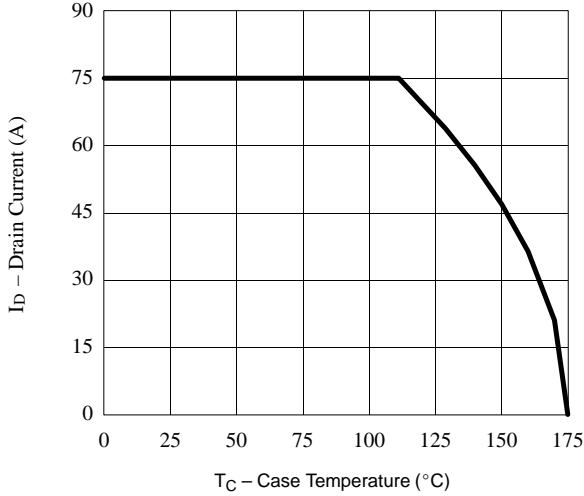
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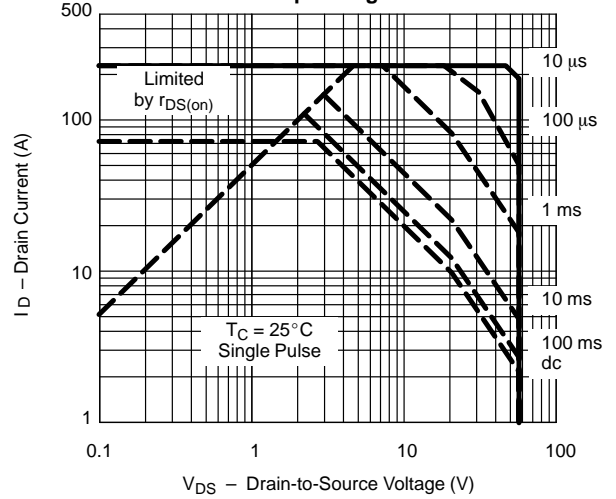


**THERMAL RATINGS**

Maximum Avalanche and Drain Current vs. Case Temperature



Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Case

