

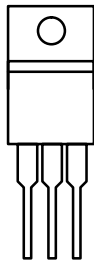
## N-Channel Enhancement-Mode Transistor

### Product Summary

$V_{(BR)DSS}$ (V)	$r_{DS(on)}$ ( $\Omega$ )	$I_D$ (A)
50	0.006	75

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

TO-220AB

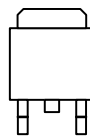


Top View

SUP75N05-06

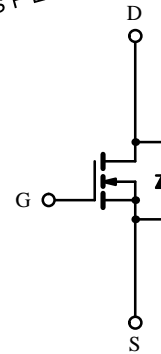
DRAIN connected to TAB

TO-263



Top View

SUB75N05-06



N-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 ( $T_J = 175^\circ\text{C}$ )	$I_D$	$T_C = 25^\circ\text{C}$	75 <sup>a</sup>
		$T_C = 125^\circ\text{C}$	70
Pulsed Drain Current	$I_{DM}$	240	A
Avalanche Current	$I_{AR}$	75	
Repetitive Avalanche Energy <sup>b</sup>	$E_{AR}$	280	mJ
Power Dissipation	$P_D$	$T_C = 25^\circ\text{C}$ (TO-220AB and TO-263)	187 <sup>c</sup>
		$T_A = 25^\circ\text{C}$ (TO-263) <sup>d</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>d</sup>	40
		Free Air (TO-220AB)	62.5
Junction-to-Case	$R_{thJC}$	0.8	$^\circ\text{C}/\text{W}$

#### Notes

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

Updates to this data sheet may be obtained via facsimile by calling Siliconix FaxBack, 1-408-970-5600. Please request FaxBack document #70292.

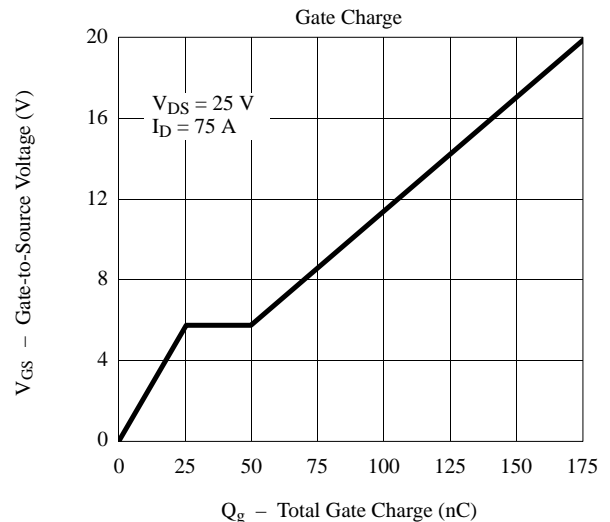
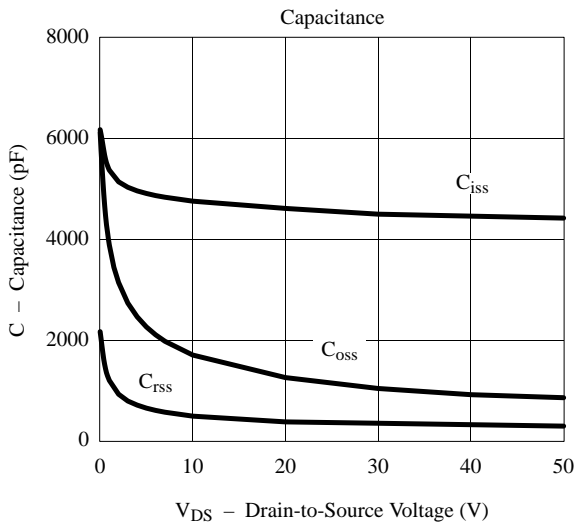
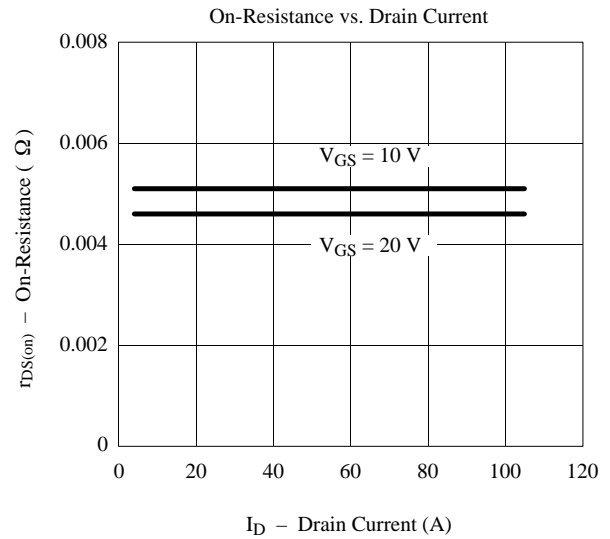
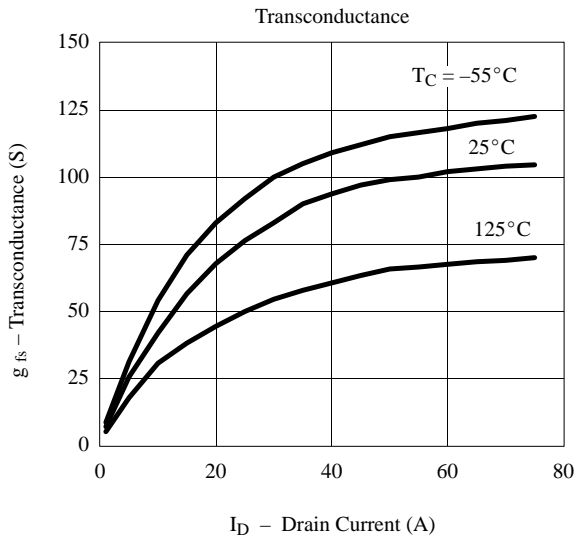
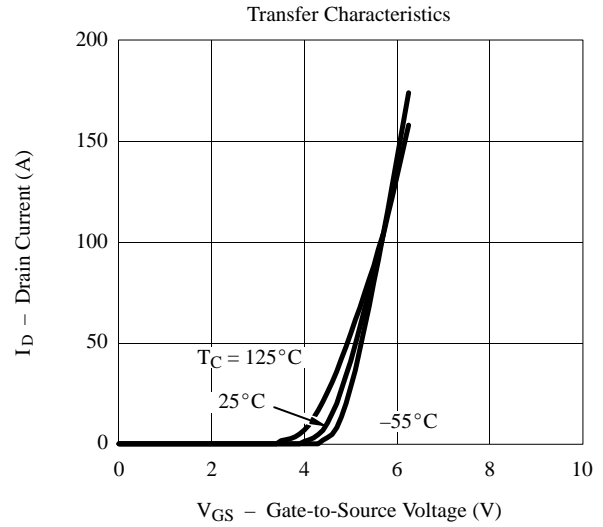
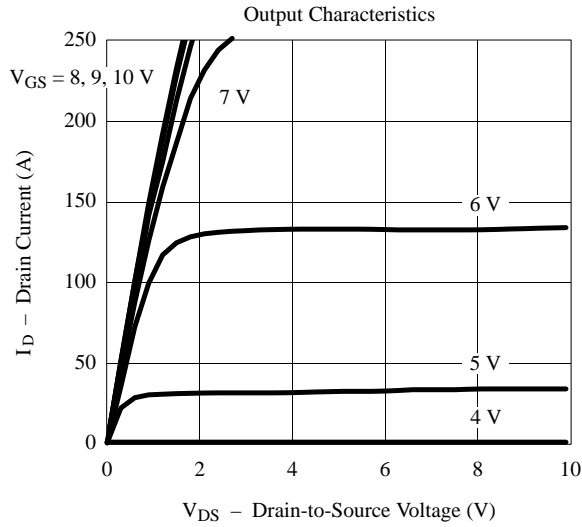
## Specifications ( $T_J = 25^\circ\text{C}$ Unless Otherwise Noted)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
<b>Static</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0\text{ V}, I_D = 250\ \mu\text{A}$	50			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\ \mu\text{A}$	2.0		4.0	
Gate-Body Leakage	$I_{GSS}$	$V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 50\text{ V}, V_{GS} = 0\text{ V}$			1	$\mu\text{A}$
		$V_{DS} = 50\text{ V}, V_{GS} = 0\text{ V}, T_J = 125^\circ\text{C}$			50	
		$V_{DS} = 50\text{ V}, V_{GS} = 0\text{ V}, T_J = 175^\circ\text{C}$			150	
On-State Drain Current <sup>b</sup>	$I_{D(on)}$	$V_{DS} = 5\text{ V}, V_{GS} = 10\text{ V}$	120			A
Drain-Source On-State Resistance <sup>b</sup>	$r_{DS(on)}$	$V_{GS} = 10\text{ V}, I_D = 75\text{ A}$		0.005	0.006	$\Omega$
		$V_{GS} = 10\text{ V}, I_D = 75\text{ A}, T_J = 125^\circ\text{C}$			0.010	
		$V_{GS} = 10\text{ V}, I_D = 75\text{ A}, T_J = 175^\circ\text{C}$			0.012	
Forward Transconductance <sup>b</sup>	$g_{fs}$	$V_{DS} = 15\text{ V}, I_D = 60\text{ A}$	30			S
<b>Dynamic<sup>a</sup></b>						
Input Capacitance	$C_{iss}$	$V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$		4500		pF
Output Capacitance	$C_{oss}$			1100		
Reverse Transfer Capacitance	$C_{rss}$			360		
Total Gate Charge <sup>c</sup>	$Q_g$	$V_{DS} = 25\text{ V}, V_{GS} = 10\text{ V}, I_D = 75\text{ A}$		85	120	nC
Gate-Source Charge <sup>c</sup>	$Q_{gs}$			25		
Gate-Drain Charge <sup>c</sup>	$Q_{gd}$			25		
Turn-On Delay Time <sup>c</sup>	$t_{d(on)}$	$V_{DD} = 25\text{ V}, R_L = 0.33\ \Omega$ $I_D \cong 75\text{ A}, V_{GEN} = 10\text{ V}, R_G = 2.5\ \Omega$		20	40	ns
Rise Time <sup>c</sup>	$t_r$			20	100	
Turn-Off Delay Time <sup>c</sup>	$t_{d(off)}$			50	100	
Fall Time <sup>c</sup>	$t_f$			20	40	
<b>Source-Drain Diode Ratings and Characteristics (<math>T_C = 25^\circ\text{C}</math>)<sup>a</sup></b>						
Continuous Current	$I_S$				75	A
Pulsed Current	$I_{SM}$				200	
Forward Voltage <sup>b</sup>	$V_{SD}$	$I_F = 75\text{ A}, V_{GS} = 0\text{ V}$		1.0	1.4	V
Reverse Recovery Time	$t_{rr}$	$I_F = 75\text{ A}, di/dt = 100\text{ A}/\mu\text{s}$		65	120	ns
Peak Reverse Recovery Current	$I_{RM(REC)}$			5	8	A
Reverse Recovery Charge	$Q_{rr}$			0.16	0.48	$\mu\text{C}$

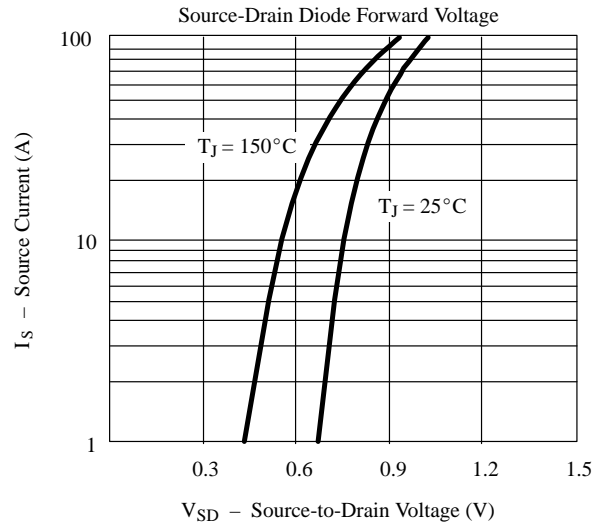
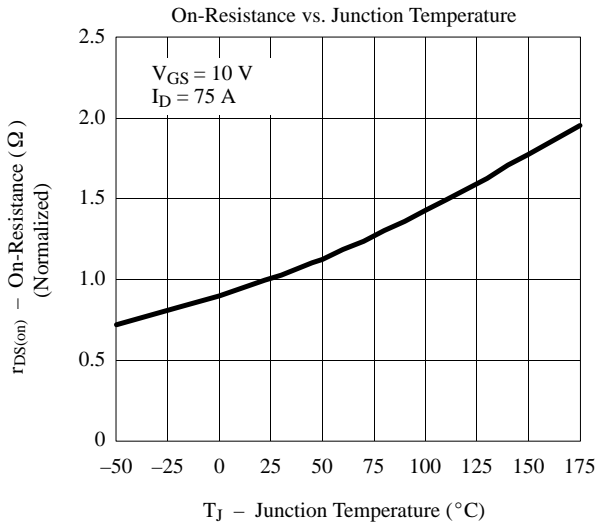
### Notes

- Guaranteed by design, not subject to production testing.
- Pulse test: pulse width  $\leq 300\ \mu\text{sec}$ , duty cycle  $\leq 2\%$ .
- Independent of operating temperature.

**Typical Characteristics (25°C Unless Otherwise Noted)**



## Typical Characteristics (25°C Unless Otherwise Noted)



## Thermal Ratings

