

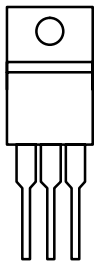


## N-Channel 30-V (D-S), 175°C MOSFET

PRODUCT SUMMARY		
$V_{(BR)DSS}$ (V)	$r_{DS(on)}$ ( $\Omega$ )	$I_D$ (A)
30	0.004	75 <sup>a</sup>

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

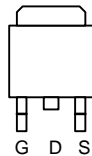
TO-220AB



Top View  
SUP75N03-04

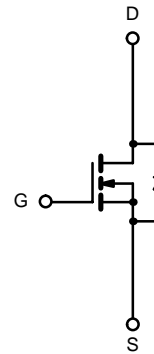
DRAIN connected to TAB

TO-263



Top View  
SUB75N03-04

DRAIN connected to TAB



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 ( $T_J = 175^\circ\text{C}$ )	$T_C = 25^\circ\text{C}$	$I_D$	75 <sup>a</sup>	A
	$T_C = 125^\circ\text{C}$		75 <sup>a</sup>	
Pulsed Drain Current		$I_{DM}$	250	
Continuous Source Current (Diode Conduction)		$I_S$	75	
Avalanche Current		$I_{AR}$	75	mJ
Avalanche Energy	L = 0.1 mH	$E_{AS}$	280	
Repetitive Avalanche Energy <sup>b</sup>	L = 0.05 mH	$E_{AR}$	140	
Maximum Power Dissipation	$T_C = 25^\circ\text{C}$ (TO-220AB and TO-263)	$P_D$	187 <sup>c</sup>	W
	$T_A = 25^\circ\text{C}$ (TO-263) <sup>d</sup>		3.7	
Operating Junction and Storage Temperature Range		$T_J, T_{stg}$	-55 to 175	$^\circ\text{C}$
Lead Temperature ( $1/16"$ from case for 10 sec.)	TO-220AB	$T_L$	300	

THERMAL RESISTANCE RATINGS				
Parameter		Symbol	Limit	Unit
Junction-to-Ambient	PCB Mount (TO-263) <sup>d</sup>	$R_{thJA}$	40	$^\circ\text{C/W}$
	Free Air (TO-220AB)		62.5	
Junction-to-Case		$R_{thJC}$	0.6	

Notes

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

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



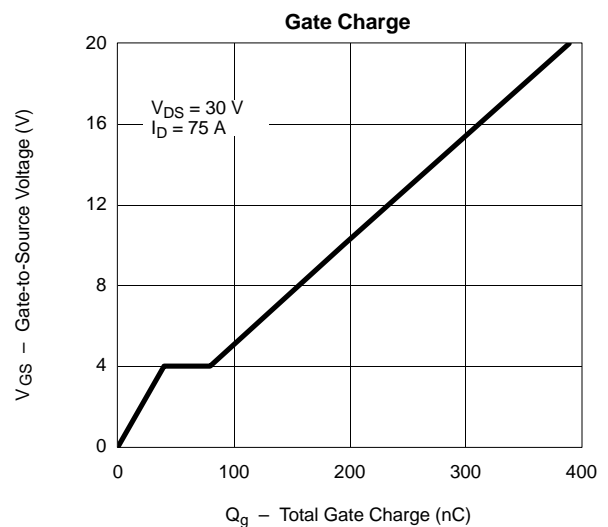
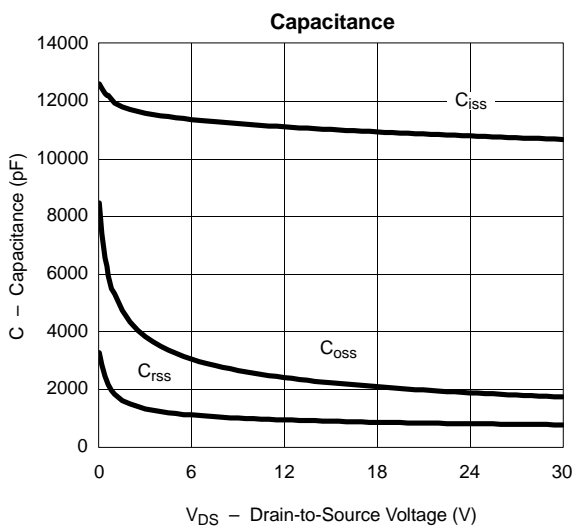
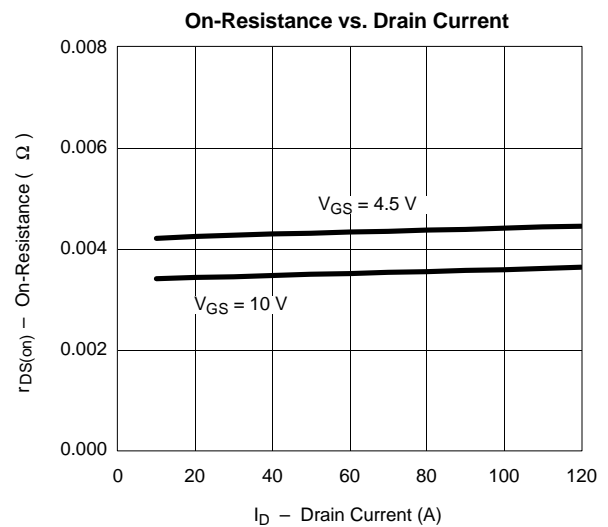
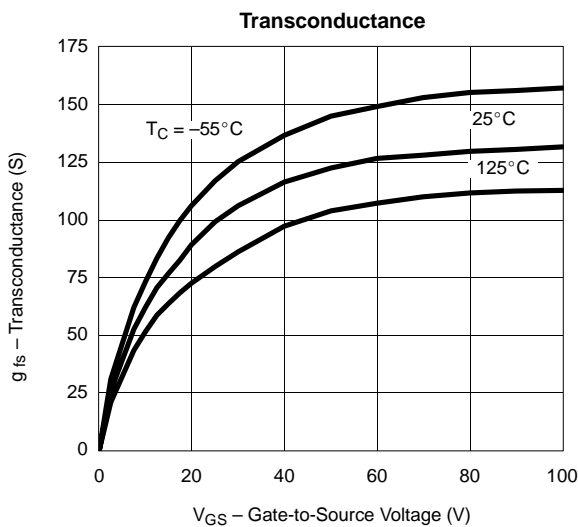
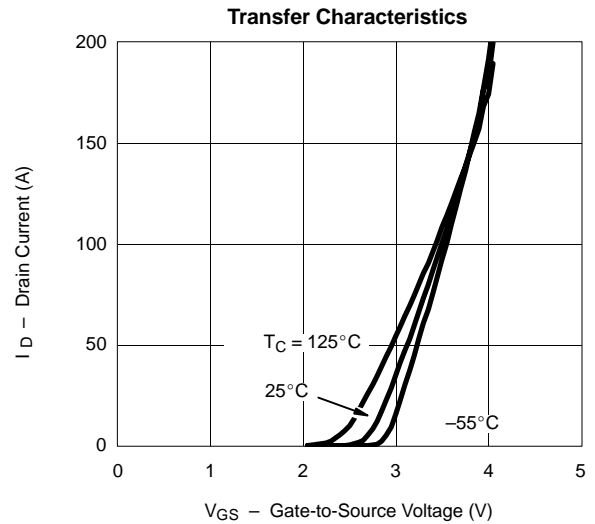
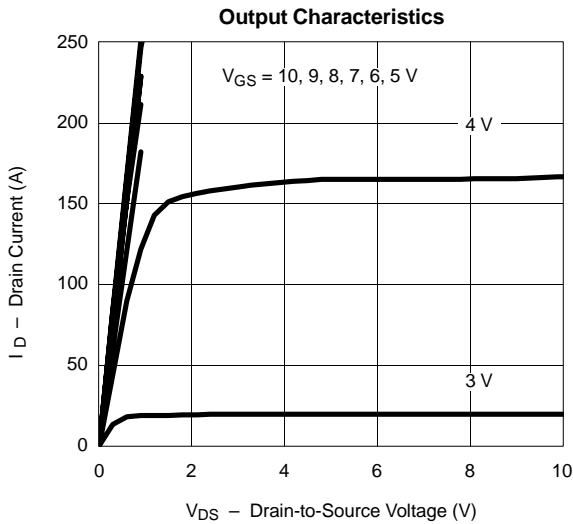
SPECIFICATIONS (T <sub>J</sub> = 25 °C UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Condition	Min	Typ <sup>a</sup>	Max	Unit
<b>Static</b>						
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0 V, I <sub>D</sub> = 250 μA	30			V
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250 μA	1		3	
Gate-Body Leakage	I <sub>GSS</sub>	V <sub>DS</sub> = 0 V, V <sub>GS</sub> = ±20 V			±500	nA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = 30 V, V <sub>GS</sub> = 0 V			1	μA
		V <sub>DS</sub> = 30 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 125 °C			50	
		V <sub>DS</sub> = 30 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 175 °C			200	
On-State Drain Current <sup>b</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>b</sup>	r <sub>DS(on)</sub>	V <sub>GS</sub> = 10 V, I <sub>D</sub> = 75 A		0.0034	0.004	Ω
		V <sub>GS</sub> = 4.5 V, I <sub>D</sub> = 75 A		0.005	0.006	
		V <sub>GS</sub> = 10 V, I <sub>D</sub> = 25 A, T <sub>J</sub> = 125 °C			0.006	
		V <sub>GS</sub> = 10 V, I <sub>D</sub> = 25 A, T <sub>J</sub> = 175 °C			0.008	
Forward Transconductance <sup>b</sup>	g <sub>fs</sub>	V <sub>DS</sub> = 15 V, I <sub>D</sub> = 25 A	30			S
<b>Dynamic</b>						
Input Capacitance	C <sub>iss</sub>	V <sub>GS</sub> = 0 V, V <sub>DS</sub> = 25 V, f = 1 MHz		10742		pF
Output Capacitance	C <sub>oss</sub>			1811		
Reverse Transfer Capacitance	C <sub>rss</sub>			775		
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> = 30 V, V <sub>GS</sub> = 10 V, I <sub>D</sub> = 75 A		200	250	nC
Gate-Source Charge	Q <sub>gs</sub>			40		
Gate-Drain Charge	Q <sub>gd</sub>			40		
Turn-On Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> = 30 V, R <sub>L</sub> = 0.6 Ω I <sub>D</sub> ≅ 50 A, V <sub>GEN</sub> = 10 V, R <sub>G</sub> = 2.5 Ω		20	40	ns
Rise Time	t <sub>r</sub>			40		
Turn-Off Delay Time	t <sub>d(off)</sub>			190		
Fall Time	t <sub>f</sub>			95		
<b>Source-Drain Diode Ratings and Characteristics</b>						
Diode Forward Voltage <sup>b</sup>	V <sub>SD</sub>	I <sub>F</sub> = 75 A, V <sub>GS</sub> = 0 V			1.3	V
Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> = 50 A, di/dt = 100 A/μs		70	120	ns
Peak Reverse Recovery Current	I <sub>RM(rec)</sub>			2.8	6	A
Reverse Recovery Charge	Q <sub>rr</sub>			0.1	0.36	μC

Notes:

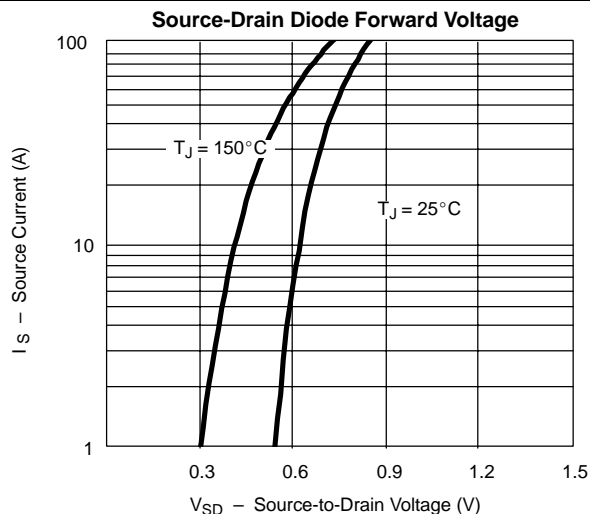
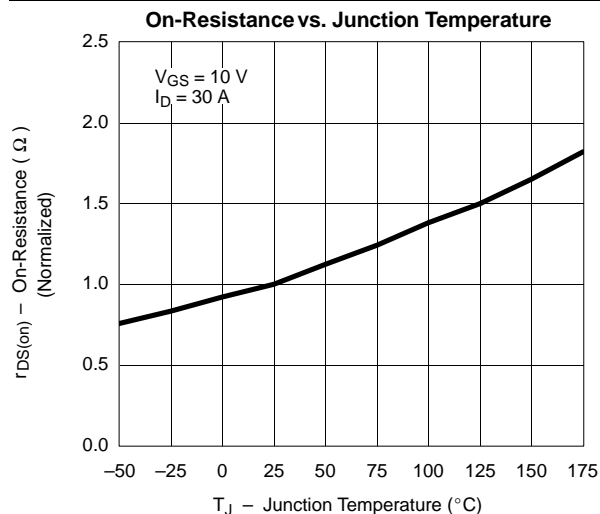
- a. For design aid only; not subject to production testing.
- b. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.



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



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



**THERMAL RATINGS**

