



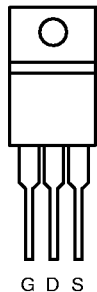
N-Channel 60-V (D-S), 175°C MOSFET

PRODUCT SUMMARY

$V_{(BR)DSS}$ (V)	$r_{DS(on)}$ (Ω)	I_D (A)
60	0.0065 @ $V_{GS} = 10$ V	$\pm 75^a$
	0.008 @ $V_{GS} = 4.5$ V	

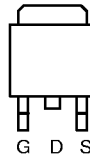
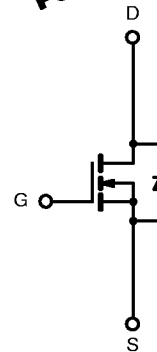
175°C Rated
Maximum Junction Temperature
TrenchFET®
Power MOSFETs

TO-220AB

Top View
SUP75N06-06

DRAIN connected to TAB

TO-263

Top View
SUB75N06-06

N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS ($T_C = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	60	V
Gate-Source Voltage		V_{GS}	± 20	
Continuous Drain Current ($T_J = 175^\circ\text{C}$)	$T_C = 25^\circ\text{C}$	I_D	$\pm 75^a$	A
	$T_C = 125^\circ\text{C}$		± 75	
Pulsed Drain Current		I_{DM}	± 240	
Avalanche Current		I_{AR}	± 75	
Repetitive Avalanche Energy ^b		E_{AR}	280	mJ
Maximum Power Dissipation ^b	$T_C = 25^\circ\text{C}$ (TO-220AB and TO-263)	P_D	250 ^c	W
	$T_A = 25^\circ\text{C}$ (TO-263) ^d		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-236) ^d	R_{thJA}	40	$^\circ\text{C/W}$
	Free Air (TO-220AB)		62.5	
Junction-to-Case		R_{thJC}	0.6	

Notes

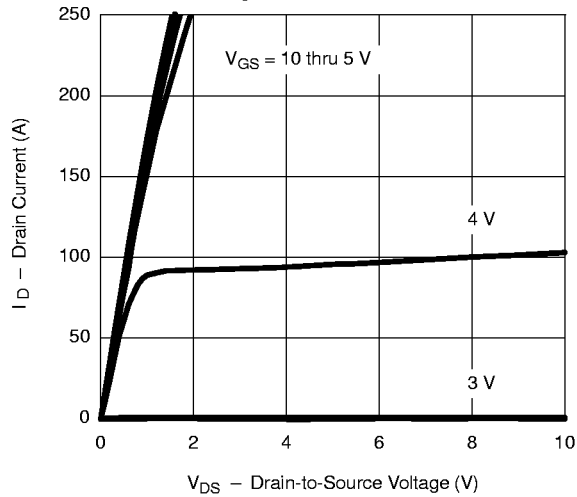
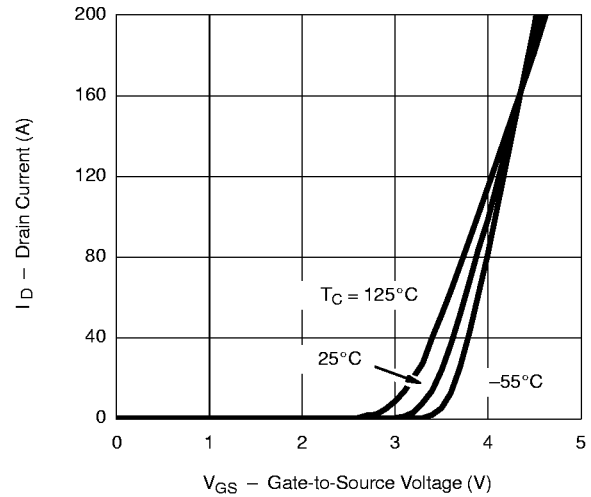
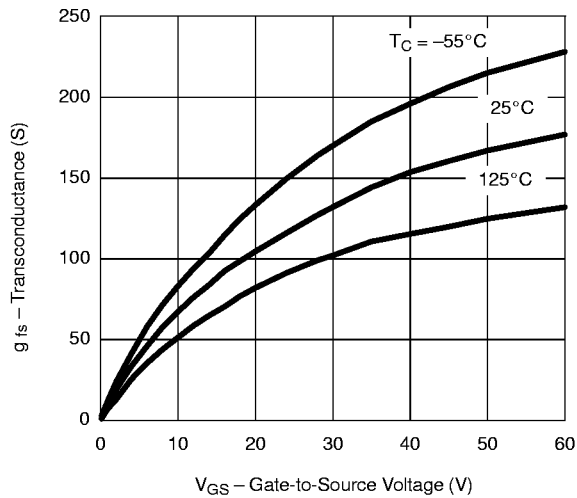
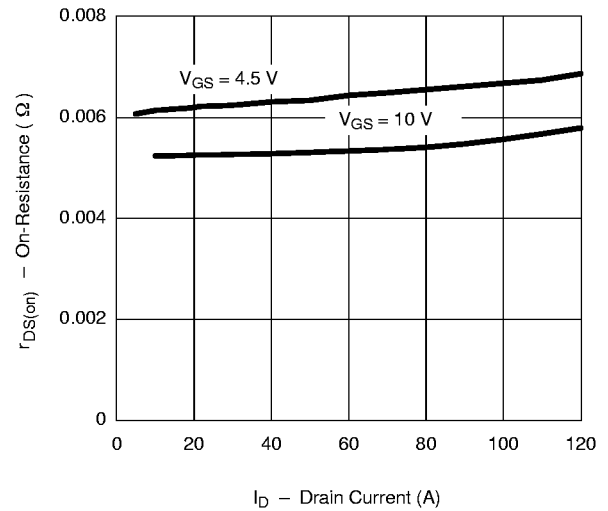
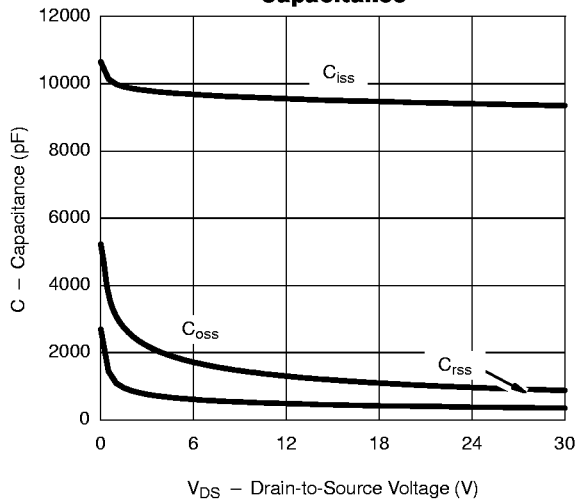
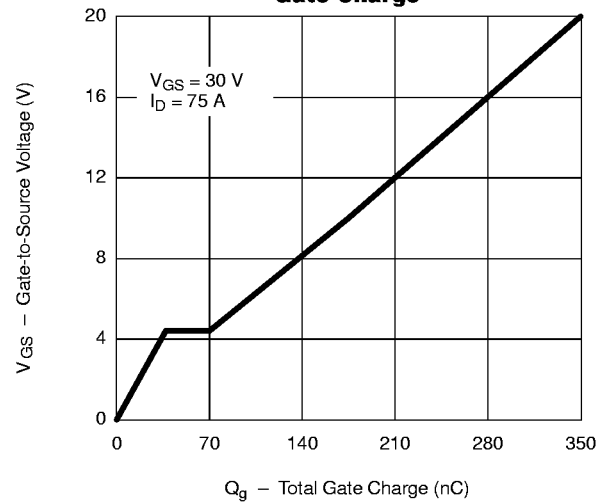
- Package limited.
- Duty cycle $\leq 1\%$.
- See SOA curve for voltage derating.
- When mounted on 1" square PCB (FR-4 material).

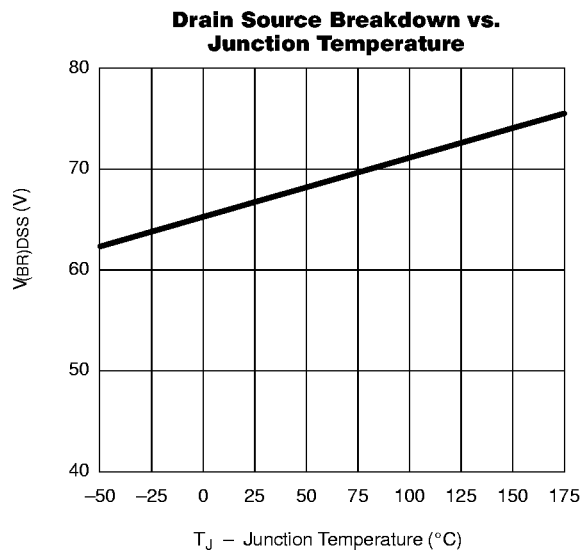
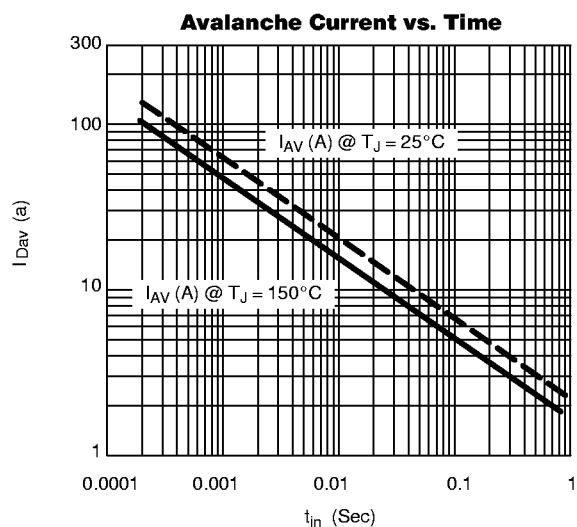
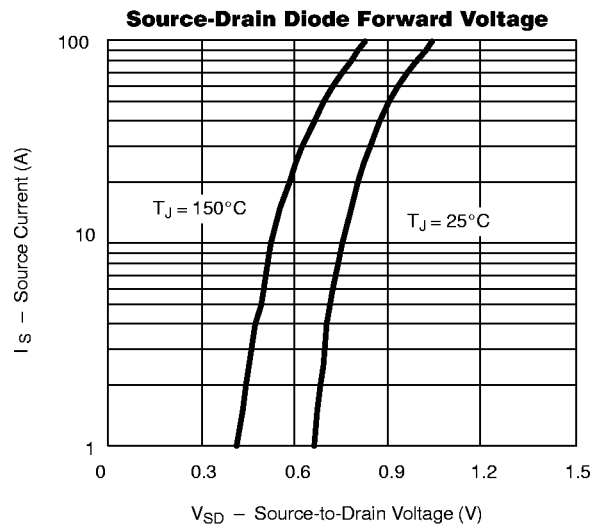
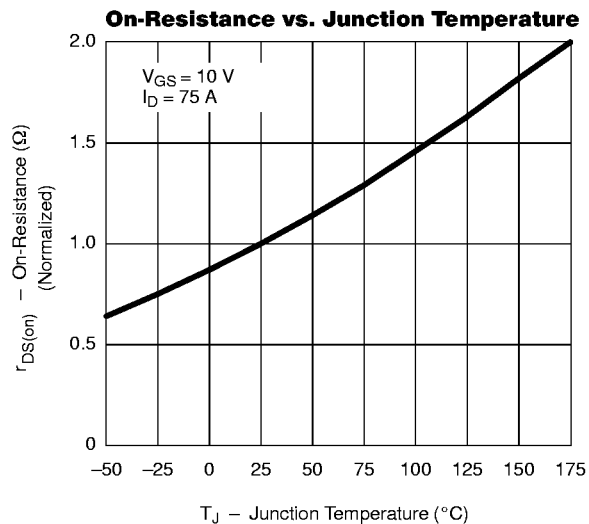
**SPECIFICATIONS ($T_J = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)**

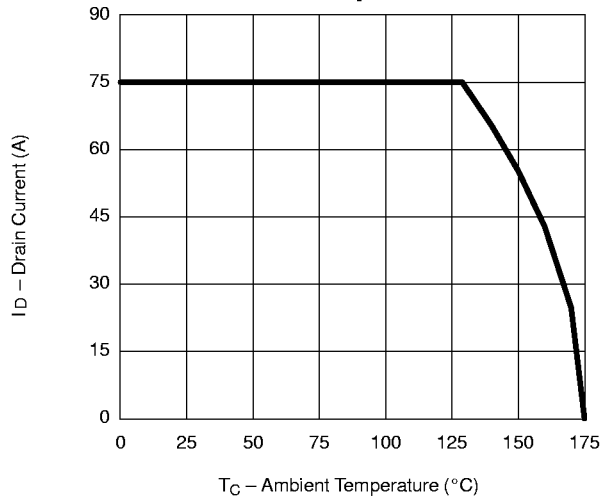
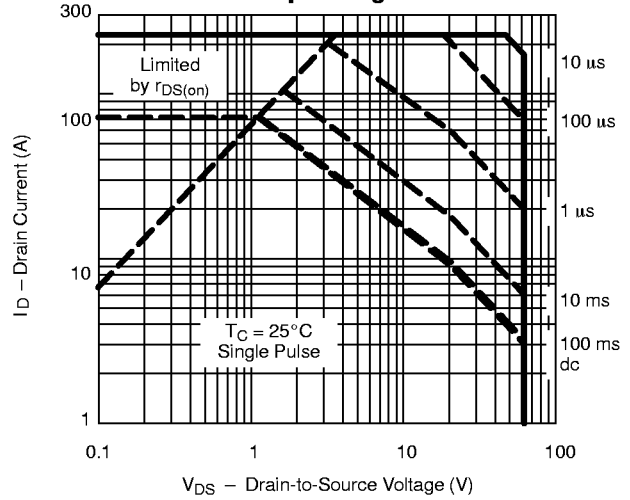
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{DS} = 0\text{ V}, I_D = 250\text{ }\mu\text{A}$	60			V
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$	1		3	
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 48\text{ V}, V_{GS} = 0\text{ V}$			1	μA
		$V_{DS} = 48\text{ V}, V_{GS} = 0\text{ V}, T_J = 125^\circ\text{C}$			50	
		$V_{DS} = 48\text{ V}, V_{GS} = 0\text{ V}, T_J = 175^\circ\text{C}$			250	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} \geq 5\text{ V}, V_{GS} = 10\text{ V}$	120			A
Drain-Source On-State Resistance ^a	$r_{DS(on)}$	$V_{GS} = 10\text{ V}, I_D = 30\text{ A}$			0.0065	Ω
		$V_{GS} = 4.5\text{ V}, I_D = 20\text{ A}$			0.008	
		$V_{GS} = 10\text{ V}, I_D = 30\text{ A}, T_J = 125^\circ\text{C}$			0.011	
		$V_{GS} = 10\text{ V}, I_D = 30\text{ A}, T_J = 175^\circ\text{C}$			0.014	
Forward Transconductance ^a	g_{fs}	$V_{DS} = 15\text{ V}, I_D = 30\text{ A}$	50			S
Dynamic ^e						
Input Capacitance	C_{iss}	$V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$		9400		pF
Output Capacitance	C_{oss}			925		
Reverse Transfer Capacitance	C_{rss}			370		
Total Gate Charge ^c	Q_g	$V_{DS} = 30\text{ V}, V_{GS} = 10\text{ V}, I_D = 75\text{ A}$		175	250	nC
Gate-Source Charge ^c	Q_{gs}			37		
Gate-Drain Charge ^c	Q_{gd}			33		
Turn-On Delay Time ^c	$t_{d(on)}$	$V_{DD} = 30\text{ V}, R_L = 0.4\text{ }\Omega$ $I_D \cong 75\text{ A}, V_{GEN} = 10\text{ V}, R_G = 2.5\text{ }\Omega$		16	25	ns
Rise Time ^c	t_r			9	20	
Turn-Off Delay Time ^c	$t_{d(off)}$			150	220	
Fall Time ^c	t_f			30	50	
Source-drain diode ratings and characteristics ($T_c = 25^\circ\text{C}$) ^b						
Continuous Current	I_S				75	A
Pulsed Current	I_{SM}				240	
Forward Voltage ^a	V_{SD}	$I_F = 75\text{ A}, V_{GS} = 0\text{ V}$		1.0	1.3	V
Reverse Recovery Time	t_{rr}	$I_F = 75\text{ A}, di/dt = 100\text{ A}/\mu\text{s}$		50	85	ns
Peak Reverse Recovery Current	$I_{RM(REC)}$			3.4	7	A
Reverse Recovery Charge	Q_{rr}			0.09	0.4	μC

Notes

- a. Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.
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 Drain Current vs.
Case Temperature****Safe Operating Area****Normalized Thermal Transient Impedance, Junction-to-Case**