

N-Channel 60-V (D-S) 175 °C MOSFET

PRODUCT SUMMARY

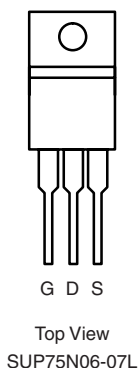
$V_{(BR)DSS}$ (V)	$r_{DS(on)}$ (Ω)	I_D (A)
60	0.0075 at $V_{GS} = 10$ V	75 ^a
	0.0085 at $V_{GS} = 4.5$ V	

FEATURES

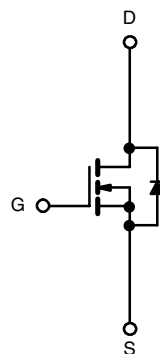
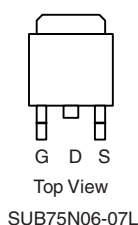
- 175 °C Rated Maximum Junction Temperature



RoHS*
COMPLIANT

TO-220AB


DRAIN connected to TAB

TO-263


N-Channel MOSFET

Ordering Information: SUB75N06-07L (TO-263)
SUB75N06-07L-E3 (TO-263, Lead (Pb)-free)
SUP75N06-07L (TO-263)
SUP75N06-07L-E3 (TO-263, Lead (Pb)-free)

ABSOLUTE MAXIMUM RATINGS $T_C = 25$ °C, unless otherwise noted

Parameter	Symbol	Limit	Unit
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ($T_J = 175$ °C)	I_D	$T_C = 25$ °C	A
		$T_C = 125$ °C	
Pulsed Drain Current	I_{DM}	240	
Avalanche Current	I_{AS}	60	
Single Pulse Avalanche Energy ^b	E_{AS}	280	mJ
Power Dissipation	P_D	$T_C = 25$ °C (TO-220AB and TO-263)	W
		$T_A = 25$ °C (TO-263) ^d	
Operating Junction and Storage Temperature Range	T_J, T_{stg}	- 55 to 175	°C

THERMAL RESISTANCE RATINGS

Parameter	Symbol	Limit	Unit
Junction-to-Ambient	R_{thJA}	PCB Mount (TO-263) ^d	°C/W
		Free Air (TO-220AB)	
Junction-to-Case	R_{thJC}	0.6	

Notes:

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

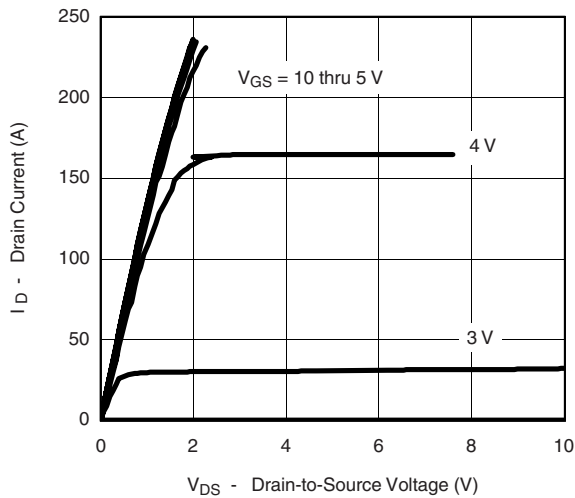
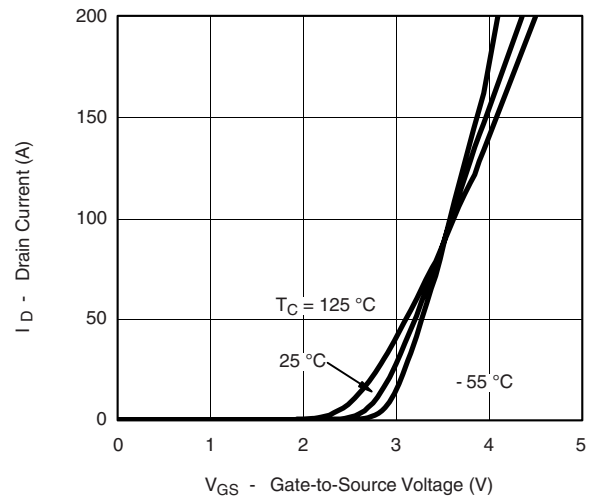
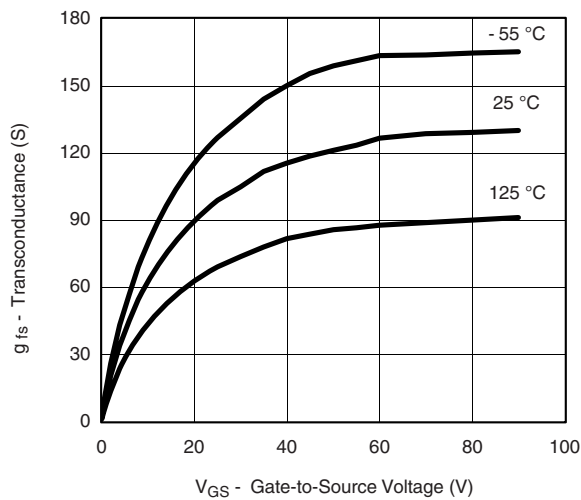
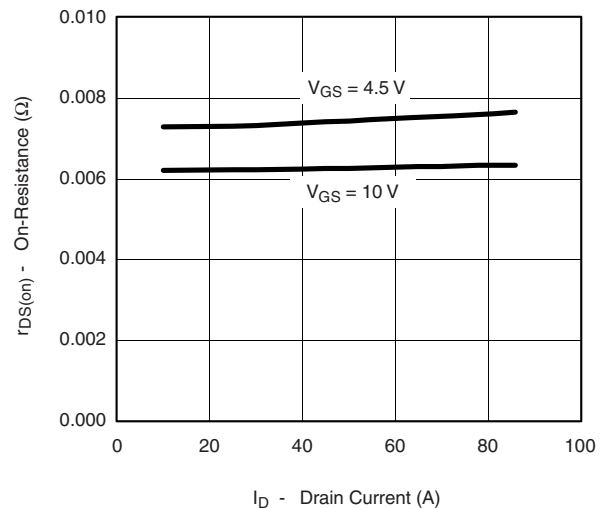
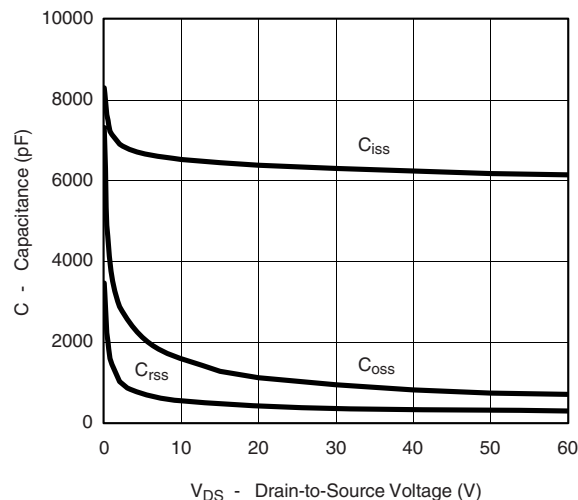
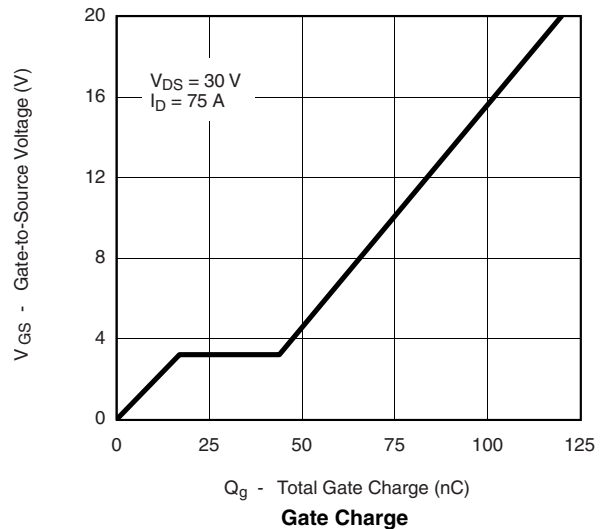
* Pb containing terminations are not RoHS compliant, exemptions may apply.

SPECIFICATIONS $T_J = 25\text{ }^{\circ}\text{C}$, unless otherwise noted						
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0\text{ V}$, $I_D = 250\text{ }\mu\text{A}$	60			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 250\text{ }\mu\text{A}$	1.0		3.0	
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}	$V_{DS} = 60\text{ V}$, $V_{GS} = 0\text{ V}$			1	μA
		$V_{DS} = 60\text{ V}$, $V_{GS} = 0\text{ V}$, $T_J = 125\text{ }^{\circ}\text{C}$			50	
		$V_{DS} = 60\text{ V}$, $V_{GS} = 0\text{ V}$, $T_J = 175\text{ }^{\circ}\text{C}$			250	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} = 5\text{ V}$, $V_{GS} = 10\text{ V}$	120			A
Drain-Source On-State Resistance ^a	$r_{DS(on)}$	$V_{GS} = 10\text{ V}$, $I_D = 30\text{ A}$		0.0061	0.0075	Ω
		$V_{GS} = 4.5\text{ V}$, $I_D = 20\text{ A}$		0.0071	0.0085	
		$V_{GS} = 10\text{ V}$, $I_D = 30\text{ A}$, $T_J = 125\text{ }^{\circ}\text{C}$			0.012	
		$V_{GS} = 10\text{ V}$, $I_D = 30\text{ A}$, $T_J = 175\text{ }^{\circ}\text{C}$			0.015	
Forward Transconductance ^a	g_{fs}	$V_{DS} = 15\text{ V}$, $I_D = 30\text{ A}$	30			S
Dynamic ^b						
Input Capacitance	C_{iss}	$V_{GS} = 0\text{ V}$, $V_{DS} = 25\text{ V}$, $f = 1\text{ MHz}$		6300		pF
Output Capacitance	C_{oss}			920		
Reverse Transfer Capacitance	C_{rss}			350		
Total Gate Charge ^c	Q_g	$V_{DS} = 30\text{ V}$, $V_{GS} = 10\text{ V}$, $I_D = 75\text{ A}$		75	120	nC
Gate-Source Charge ^c	Q_{gs}			18		
Gate-Drain Charge ^c	Q_{gd}			27		
Turn-On Delay Time ^c	$t_{d(on)}$	$V_{DD} = 30\text{ V}$, $R_L = 0.47\text{ }\Omega$ $I_D \cong 75\text{ A}$, $V_{GEN} = 10\text{ V}$, $R_G = 2.5\text{ }\Omega$		14	40	ns
Rise Time ^c	t_r			15	40	
Turn-Off Delay Time ^c	$t_{d(off)}$			150	300	
Fall Time ^c	t_f			50	100	
Source-Drain Diode Ratings and Characteristics $(T_C = 25\text{ }^{\circ}\text{C})^b$						
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}	$I_F = 75\text{ A}$, $di/dt = 100\text{ A}/\mu\text{s}$		67	120	ns
Peak Reverse Recovery Current	$I_{RM(REC)}$			6	8	A
Reverse Recovery Charge	Q_{rr}				0.2	0.48

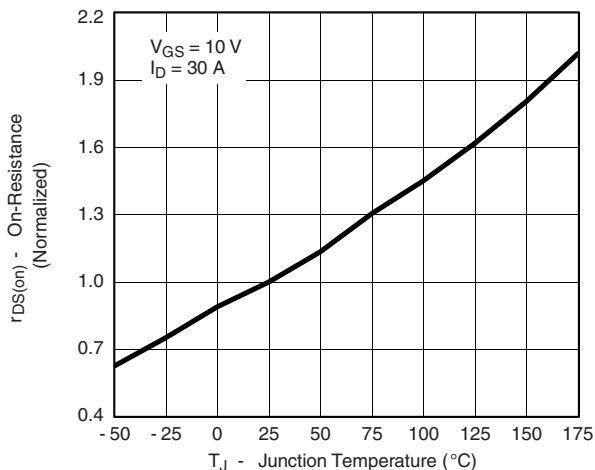
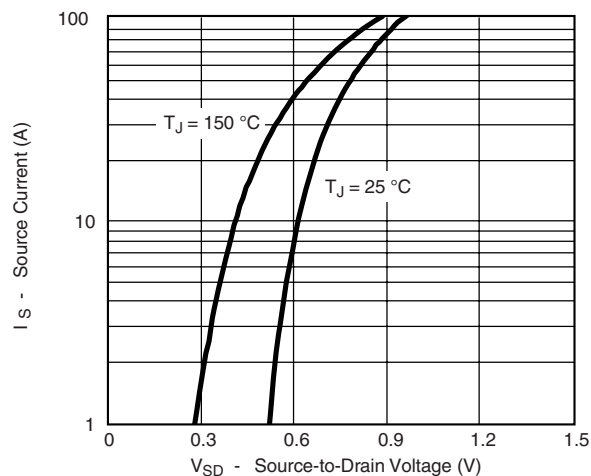
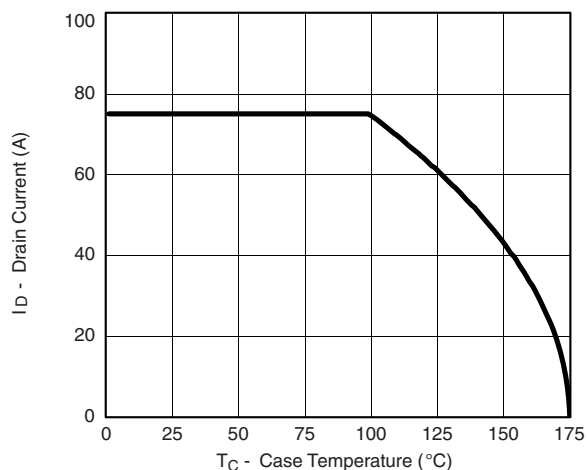
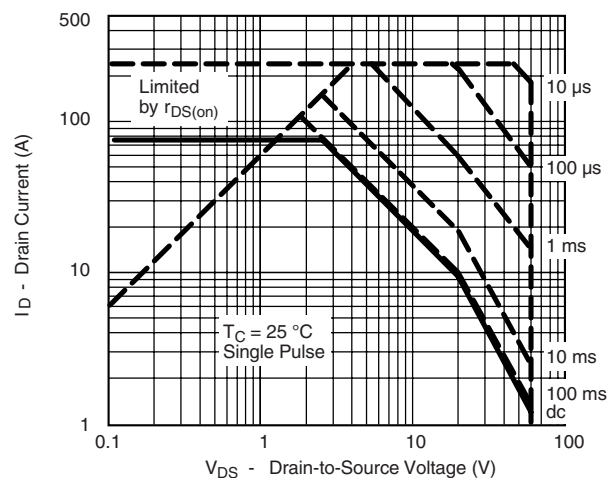
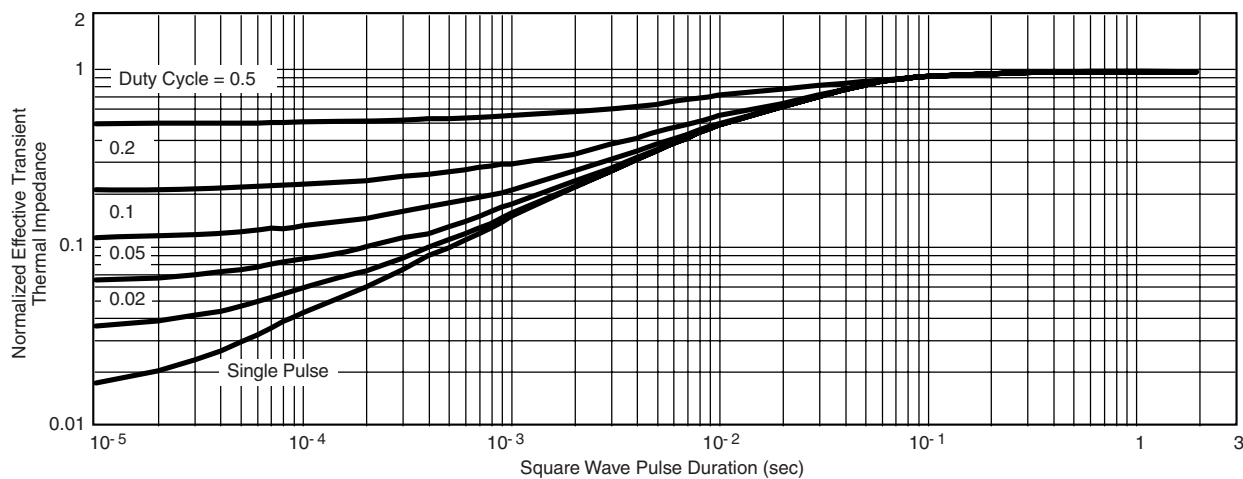
Notes:

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

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

**TYPICAL CHARACTERISTICS** 25 °C, unless otherwise noted**Output Characteristics****Transfer Characteristics****Transconductance****On-Resistance vs. Drain Current****Capacitance****Gate Charge**

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TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted**On-Resistance vs. Junction Temperature****Source-Drain Diode Forward Voltage****THERMAL RATINGS****Maximum Avalanche and Drain Current vs. Case Temperature****Safe Operating Area****Normalized Thermal Transient Impedance, Junction-to-Case**

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