

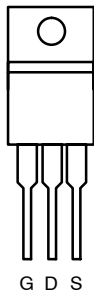


N-Channel 50-V (D-S), 175 °C MOSFET

PRODUCT SUMMARY

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

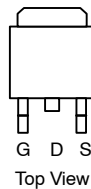
TO-220AB



Top View

Ordering Information: SUP75N05-06A

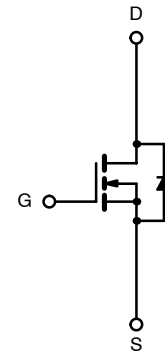
TO-263



Top View

Ordering Information: SUB75N05-06A

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}	± 20	V
Continuous Drain Current ($T_J = 175^\circ\text{C}$)	I_D	$T_C = 25^\circ\text{C}$	75 ^a
		$T_C = 125^\circ\text{C}$	70
Pulsed Drain Current	I_{DM}	240	A
Avalanche Current	I_{AR}	75	
Repetitive Avalanche Energy ^b	E_{AR}	280	mJ
Power Dissipation	P_D	$T_C = 25^\circ\text{C}$ (TO-220AB and TO-263)	250 ^c
		$T_A = 25^\circ\text{C}$ (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	R_{thJA}	PCB Mount (TO-263) ^d	40
		Free Air (TO-220AB)	62.5
Junction-to-Case	R_{thJC}	0.6	$^\circ\text{C}/\text{W}$

Notes

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



SPECIFICATIONS (T _J = 25 °C UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} = 0 V, I _D = 250 μA	50			V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250 μA	2.0		4.0	
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ± 20 V			± 100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 50 V, V _{GS} = 0 V			1	μA
		V _{DS} = 50 V, V _{GS} = 0 V, T _J = 125 °C			50	
		V _{DS} = 50 V, V _{GS} = 0 V, T _J = 175 °C			150	
On-State Drain Current ^a	I _{D(on)}	V _{DS} = 5 V, V _{GS} = 10 V	120			A
Drain-Source On-State Resistance ^a	r _{DS(on)}	V _{GS} = 10 V, I _D = 75 A		0.005	0.006	Ω
		V _{GS} = 10 V, I _D = 75 A, T _J = 125 °C			0.010	
		V _{GS} = 10 V, I _D = 75 A, T _J = 175 °C			0.012	
Forward Transconductance ^a	g _{fs}	V _{DS} = 15 V, I _D = 60 A	30			S
Dynamic^b						
Input Capacitance	C _{iss}	V _{GS} = 0 V, V _{DS} = 25 V, f = 1 MHz		4500		pF
Output Capacitance	C _{oss}			1100		
Reverse Transfer Capacitance	C _{rss}			360		
Total Gate Charge ^c	Q _g	V _{DS} = 25 V, V _{GS} = 10 V, I _D = 75 A		85	120	nC
Gate-Source Charge ^c	Q _{gs}			25		
Gate-Drain Charge ^c	Q _{gd}			25		
Gate Resistance	R _g	f = 1.0 MHz		3		Ω
Turn-On Delay Time ^c	t _{d(on)}	V _{DD} = 25 V, R _L = 0.33 Ω I _D ≅ 75 A, V _{GEN} = 10 V, R _g = 2.5 Ω		20	40	ns
Rise Time ^c	t _r			20	100	
Turn-Off Delay Time ^c	t _{d(off)}			50	100	
Fall Time ^c	t _f			20	40	
Source-Drain Diode Ratings and Characteristics (T_C = 25 °C)^b						
Continuous Current	I _S				75	A
Pulsed Current	I _{SM}				200	
Forward Voltage ^a	V _{SD}	I _F = 75 A, V _{GS} = 0 V		1.0	1.4	V
Reverse Recovery Time	t _{rr}	I _F = 75 A, di/dt = 100 A/μs		65	120	ns
Peak Reverse Recovery Current	I _{RM(REC)}			5	8	A
Reverse Recovery Charge	Q _{rr}				0.16	0.48

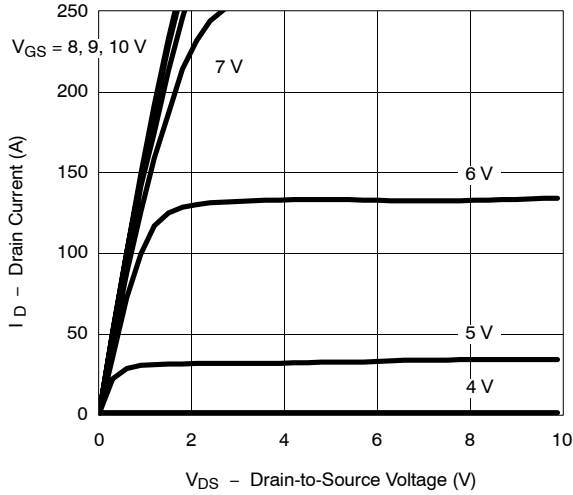
Notes

- a. Pulse test: pulse width ≤ 300 μsec, duty cycle ≤ 2%.
- b. Guaranteed by design, not subject to production testing.
- c. Independent of operating temperature.

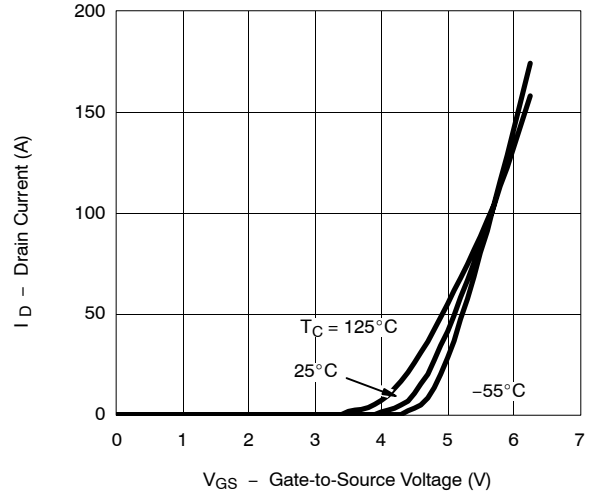


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

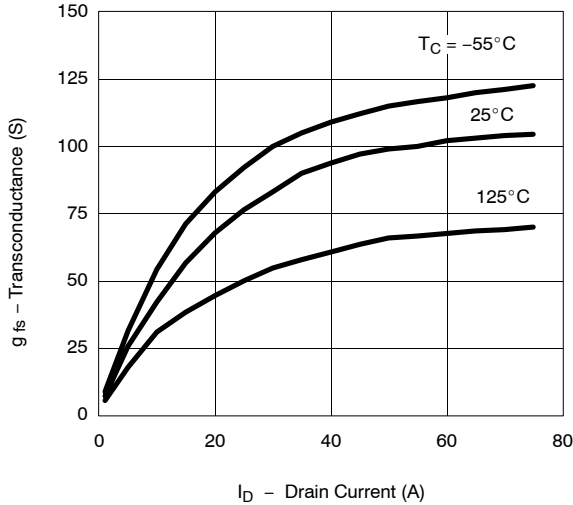
Output Characteristics



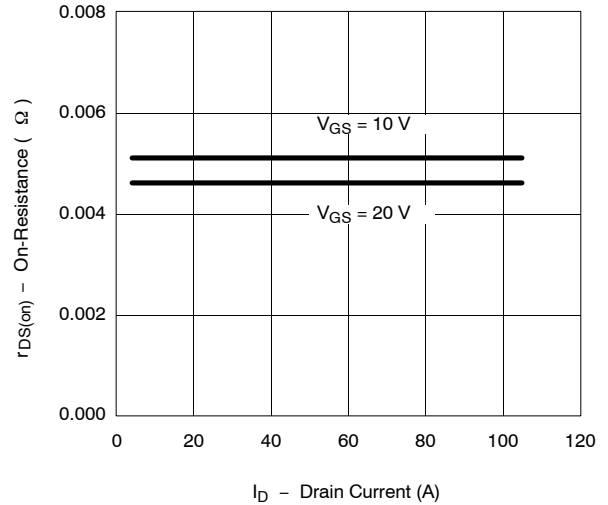
Transfer Characteristics



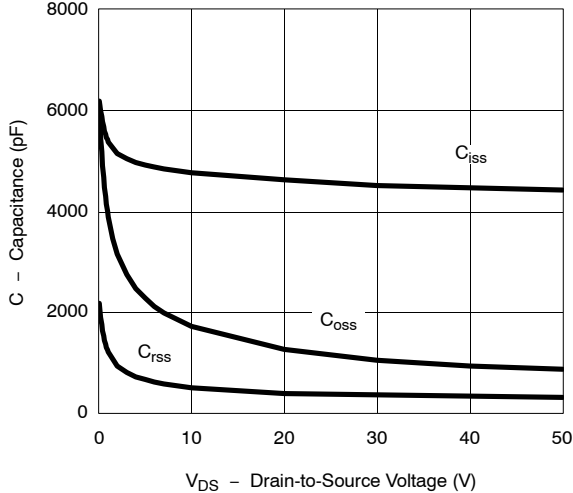
Transconductance



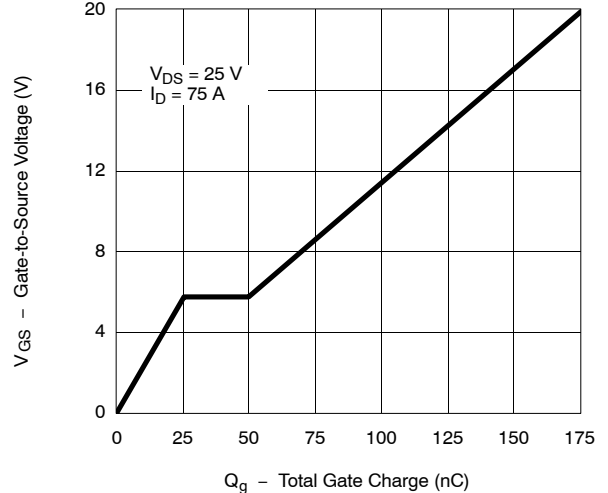
On-Resistance vs. Drain Current



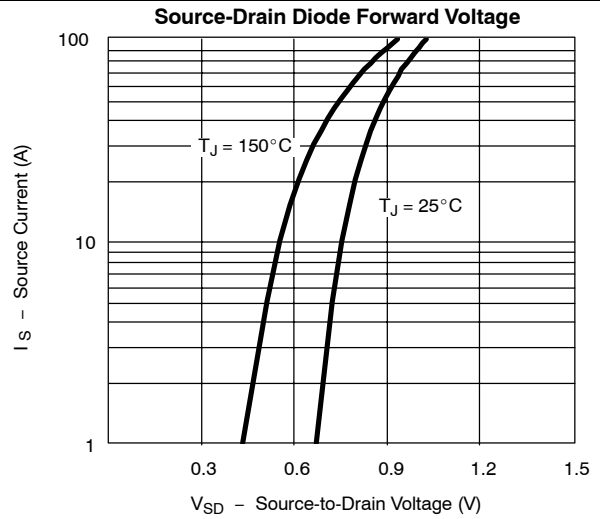
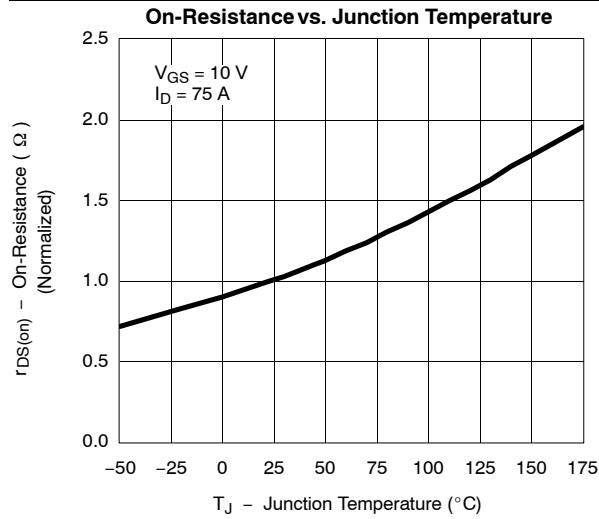
Capacitance



Gate Charge



TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)



THERMAL RATINGS

