



New Product

SUP/SUB75N05-07

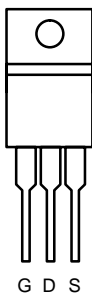
Vishay Siliconix

N-Channel 55-V (D-S), 175 °C MOSFET

PRODUCT SUMMARY		
$V_{(BR)DSS}$ (V)	$r_{DS(on)}$ (Ω)	I_D (A)
55	0.007 @ $V_{GS} = 10$ V	$\pm 75^a$
	0.009 @ $V_{GS} = 4.5$ V	

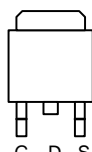
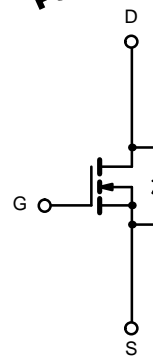
175 °C Rated
Maximum Junction Temperature
TrenchFET[®]
Power MOSFETS

TO-220AB

Top View
SUP75N05-07

DRAIN connected to TAB

TO-263

Top View
SUB75N05-07

N-Channel MOSFET

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ABSOLUTE MAXIMUM RATINGS ($T_C = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)			
Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	55	V
Gate-Source Voltage	V_{GS}	± 20	
Continuous Drain Current ($T_J = 175^\circ\text{C}$)	I_D	$T_C = 25^\circ\text{C}$	$\pm 75^a$
		$T_C = 125^\circ\text{C}$	± 60
Pulsed Drain Current	I_{DM}	± 240	A
Avalanche Current	I_{AR}	± 60	
Repetitive Avalanche Energy ^b	E_{AR}	L = 0.1 mH	180
Maximum Power Dissipation		$T_C = 25^\circ\text{C}$ (TO-220AB and TO-263)	158 ^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}	0.95	$^\circ\text{C/W}$

Notes

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

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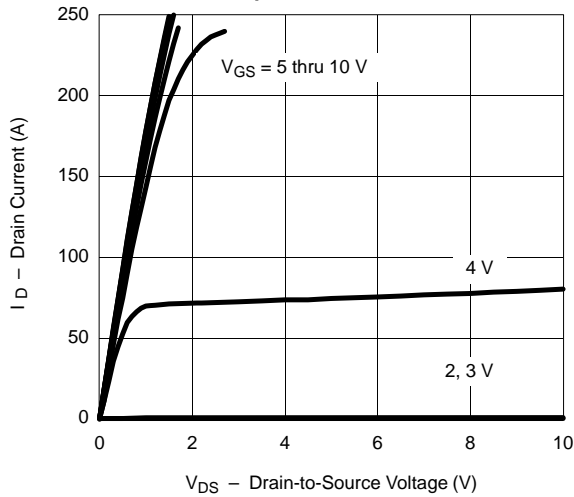
SPECIFICATIONS (T _J = 25 °C UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{DS} = 0 V, I _D = 250 μA	55			V
Gate-Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250 μA	1		3	
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ±20 V			±100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 44 V, V _{GS} = 0 V			1	μA
		V _{DS} = 44 V, V _{GS} = 0 V, T _J = 125 °C			50	
		V _{DS} = 44 V, V _{GS} = 0 V, T _J = 175 °C			250	
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 = 30 A		0.0056	0.007	Ω
		V _{GS} = 4.5 V, I _D = 20 A		0.0072	0.009	
		V _{GS} = 10 V, I _D = 30 A, T _J = 125 °C			0.011	
		V _{GS} = 10 V, I _D = 30 A, T _J = 175 °C			0.015	
Forward Transconductance ^a	g _{fs}	V _{DS} = 15 V, I _D = 30 A	40			S
Dynamic^b						
Input Capacitance	C _{iss}	V _{GS} = 0 V, V _{DS} = 25 V, f = 1 MHz		6830		pF
Output Capacitance	C _{oss}			720		
Reverse Transfer Capacitance	C _{rss}			350		
Total Gate Charge ^c	Q _g	V _{DS} = 30 V, V _{GS} = 10 V, I _D = 75 A		135	170	nC
Gate-Source Charge ^c	Q _{gs}			25		
Gate-Drain Charge ^c	Q _{gd}			34		
Turn-On Delay Time ^c	t _{d(on)}	V _{DD} = 30 V, R _L = 0.47 Ω I _D ≈ 75 A, V _{GEN} = 10 V, R _G = 2.5 Ω		13	20	ns
Rise Time ^c	t _r			11	20	
Turn-Off Delay Time ^c	t _{d(off)}			90	160	
Fall Time ^c	t _f			25	40	
Source-drain Diode Ratings and Characteristics (T_c = 25 °C)^b						
Continuous Current	I _S				75	A
Pulsed Current	I _{SM}				240	
Forward Voltage ^a	V _{SD}	I _F = 75 A, V _{GS} = 0 V		1.0	1.3	V
Reverse Recovery Time	t _{rr}	I _F = 75 A, di/dt = 100 A/μs		45	80	ns
Peak Reverse Recovery Current	I _{RM(REC)}			2	5	A
Reverse Recovery Charge	Q _{rr}			0.09	0.4	μC

Notes

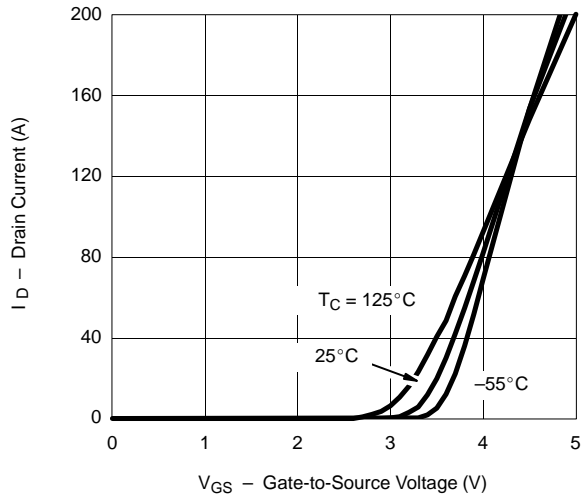
- Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.
- Guaranteed by design, not subject to production testing.
- Independent of operating temperature.


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

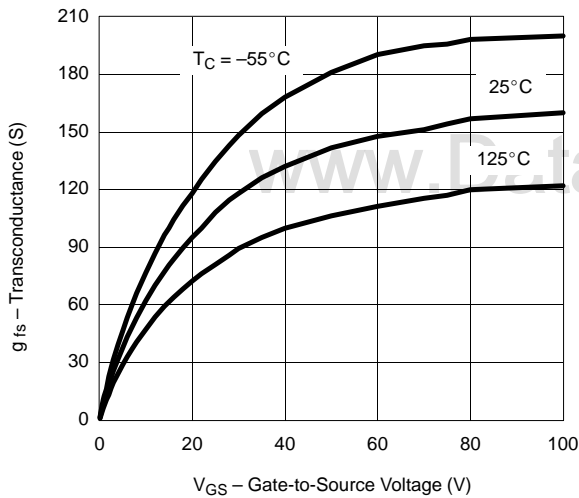
Output Characteristics



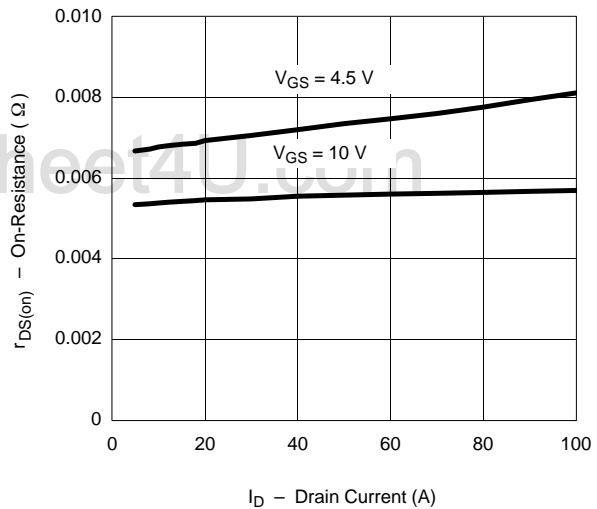
Transfer Characteristics



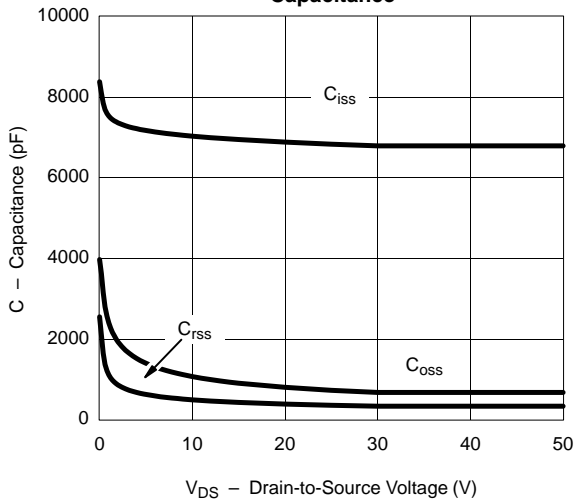
Transconductance



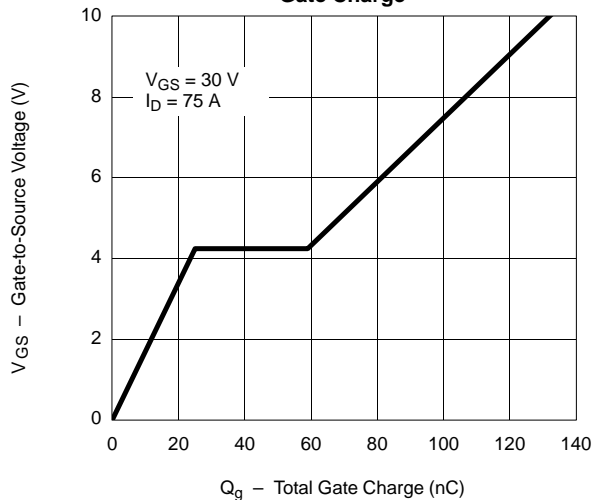
On-Resistance vs. Drain Current



Capacitance



Gate Charge



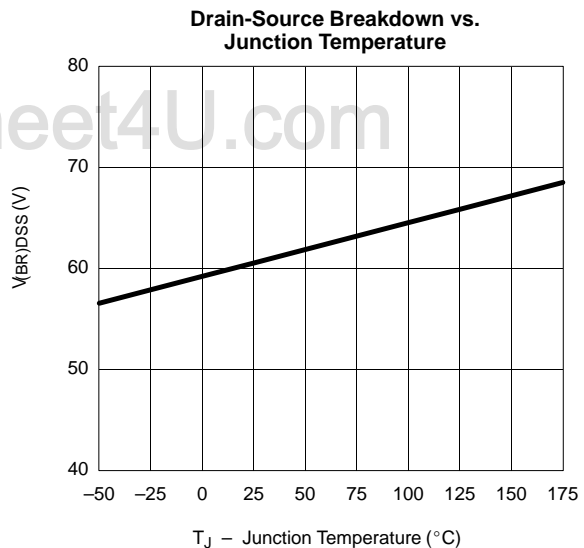
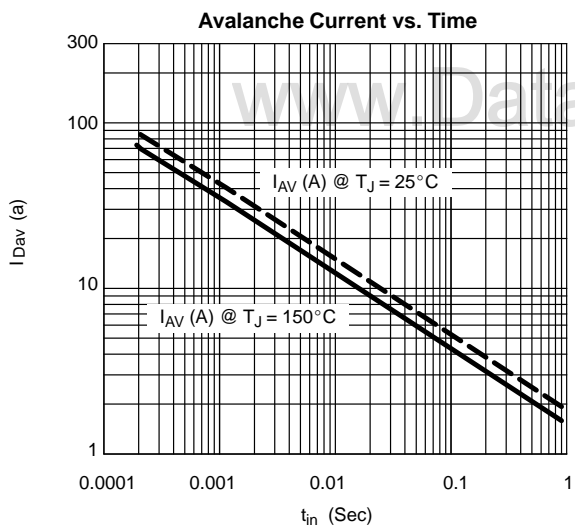
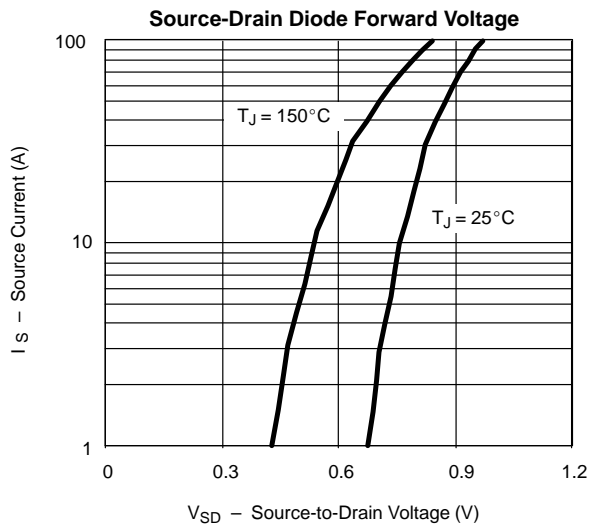
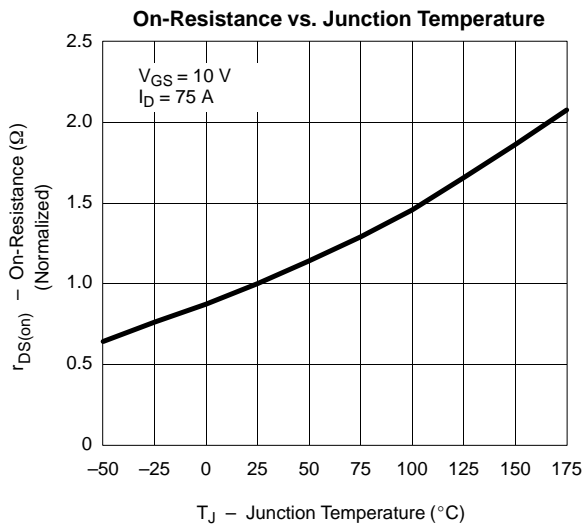
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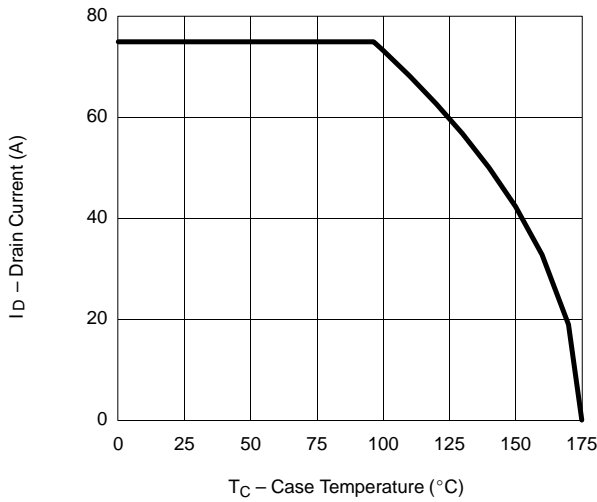
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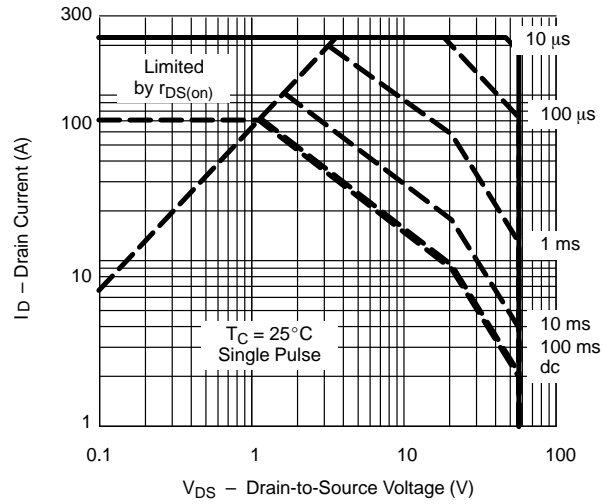


THERMAL RATINGS

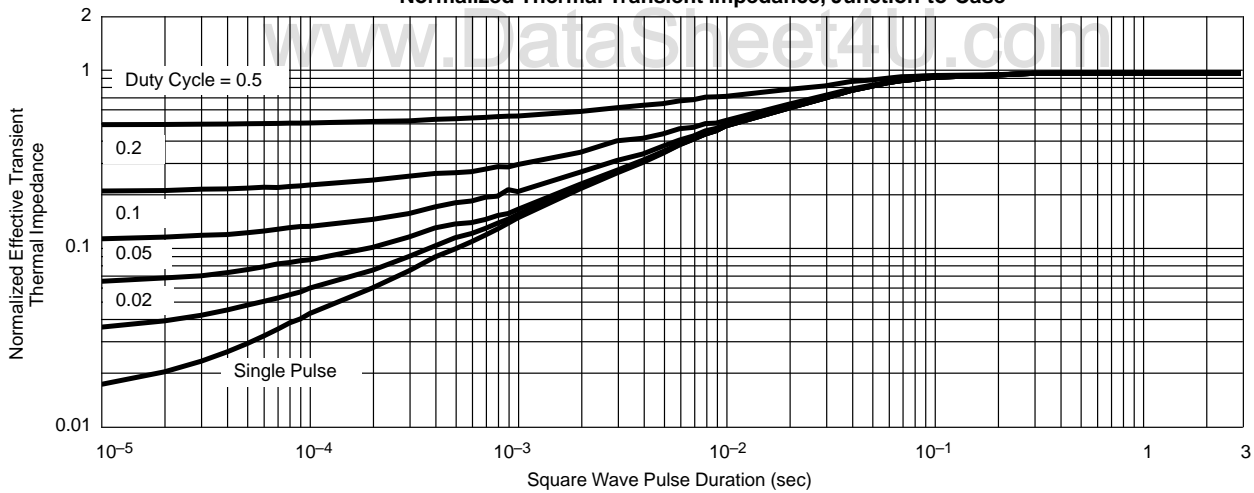
Maximum Drain Current vs. Case Temperature



Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Case





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