

Vishay Siliconix

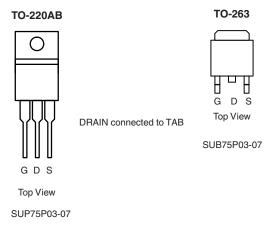
P-Channel 30 V (D-S) 175 °C MOSFET

PRODUCT SUMMARY $I_D(A)^a$ V_{DS} (V) $R_{DS(on)}(\Omega)$ 0.007 at $V_{GS} = -10 \text{ V}$ ± 75 - 30 0.010 at $V_{GS} = -4.5 \text{ V}$ ± 75

FEATURES

• Compliant to RoHS Directive 2002/95/EC



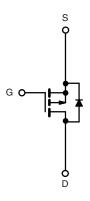


Ordering Information: SUB75P03-07 (TO-263)

SUB75P03-07-E3 (TO-263, Lead (Pb)-free)

SUP75P03-07 (TO-220AB)

SUP75P03-07-E3 (TO-220AB, Lead (Pb)-free)



P-Channel MOSFET

ABSOLUTE MAXIMUM RAT	INGS ($T_C = 25 ^{\circ}C$, unless other	rwise noted)			
Parameter	Symbol	Limit ± 20	Unit V		
Gate-Source Voltage	V_{GS}				
Continuous Drain Current (T _J = 175 °C)	T _C = 25 °C	l _D	- 75 ^a	^	
	T _C = 125 °C		- 65		
Pulsed Drain Current	I _{DM}	- 240	A		
Avalanche Current		I _{AR}			- 60
Repetitive Avalanche Energy ^b	L = 0.1 mH	E _{AR}	180	mJ	
Power Dissipation	T _C = 25 °C (TO-220AB and TO-263)	В	187 ^d	W	
	T _A = 25 °C (TO-263) ^c	P _D	3.75]	
Operating Junction and Storage Temperature Range		T _J , T _{stg}	- 55 to 175	°C	

THERMAL RESISTANCE RATINGS								
Parameter		Symbol	Limit	Unit				
Junction-to-Ambient	PCB Mount (TO-263) ^c	В	40	°C/W				
	Free Air (TO-220AB)	R _{thJA}	62.5					
Junction-to-Case		R_{thJC}	0.8]				

Notes:

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

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

SUB75P03-07, SUP75P03-07

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Parameter	Symbol	Test Conditions	Min.	Тур.	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V _{DS}	$V_{GS} = 0 \text{ V}, I_D = -250 \mu\text{A}$	- 30			V
Gate Threshold Voltage	V _{GS(th)}	$V_{DS} = V_{GS}, I_{D} = -250 \mu A$	- 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		$V_{DS} = -30 \text{ V}, V_{GS} = 0 \text{ V}$			- 1	μΑ
	I _{DSS}	$V_{DS} = -30 \text{ V}, V_{GS} = 0 \text{ V}, T_{J} = 125 ^{\circ}\text{C}$			- 50	
		$V_{DS} = -30 \text{ V}, V_{GS} = 0 \text{ V}, T_{J} = 175 ^{\circ}\text{C}$			- 250	
On-State Drain Current ^a	I _{D(on)}	V _{DS} = - 5 V, V _{GS} = - 10 V	- 120			Α
Drain-Source On-State Resistance ^a		V _{GS} = - 10 V, I _D = - 30 A		0.0055	0.007	Ω
	Ь	V _{GS} = - 10 V, I _D = - 30 A, T _J = 125 °C			0.010	
	R _{DS(on)}	$V_{GS} = -10 \text{ V}, I_D = -30 \text{ A}, T_J = 175 ^{\circ}\text{C}$			0.013	
		$V_{GS} = -4.5 \text{ V}, I_D = -20 \text{ A}$		0.008	0.010	
Forward Transconductance ^a	9 _{fs}	V _{DS} = - 15 V, I _D = - 75 A	20			S
Dynamic ^b						
Input Capacitance	C _{iss}	V _{GS} = 0 V, V _{DS} = - 25 V, f = 1 MHz		9000		pF
Output Capacitance	C _{oss}			1565		
Reversen Transfer Capacitance	C _{rss}			715		
Total Gate Charge ^c	Qg	V _{DS} = - 15 V, V _{GS} = - 10 V, I _D = - 75 A		160	240	nC
Gate-Source Charge ^c	Q_{gs}			32		
Gate-Drain Charge ^c	Q _{gd}			30		
Turn-On Delay Time ^c	t _{d(on)}			25	40	ns
Rise Time ^c	t _r	V_{DD} = - 15 V, R_L = 0.2 Ω $I_D \cong$ - 75 A, V_{GEN} = - 10 V, R_g = 2.5 Ω		225	360	
Turn-Off Delay Time ^c	t _{d(off)}			150	240	
Fall Time ^c	t _f			210	340	
Source-Drain Diode Ratings and Cha	racteristics ^b	(T _C = 25 °C)				
Continuous Current	I _S				- 75	^
Pulsed Current	I _{SM}				- 240	A
Forward Voltage ^a	V _{SD}	I _F = - 75 A, V _{GS} = 0 V		- 1.2	- 1.5	V
Reverse Recovery Time	t _{rr}	I _F = - 75 A, dl/dt = 100 A/μs		55	100	ns
Peak Reverse Recovery Current	I _{RM(REC)}			2.5	5	Α
Reverse Recovery Charge	Q _{rr}			0.07	0.25	μС

Notes:

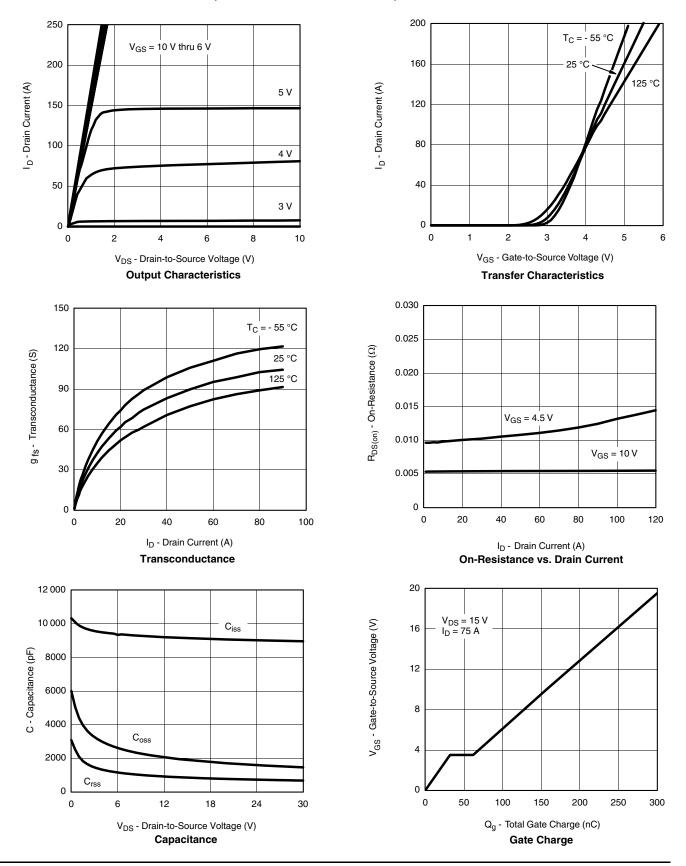
- a. Pulse test; pulse width $\leq 300~\mu s,$ duty cycle $\leq 2~\%.$
- b. Guaranteed by design, not subject to production testing.
- c. Independent of operating temperature.

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)

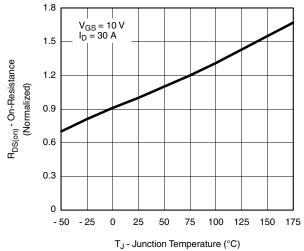


SUB75P03-07, SUP75P03-07

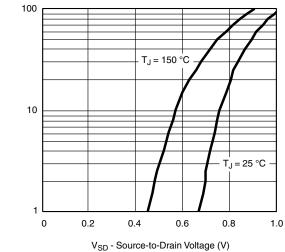
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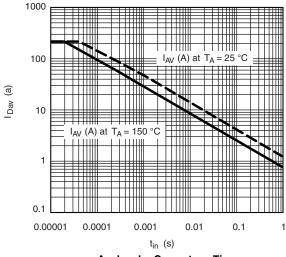


On-Resistance vs. Junction Temperature

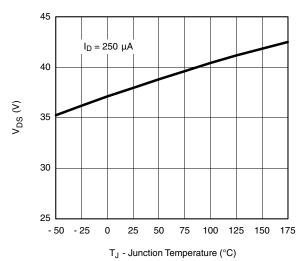


I_S - Source Current (A)

Source-Drain Diode Forward Voltage



Avalanche Current vs. Time

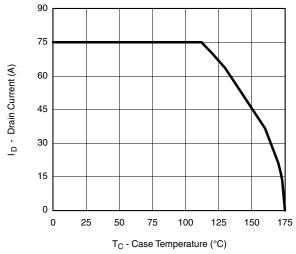


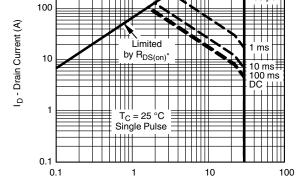
Drain Source Breakdown vs. Junction Temperature



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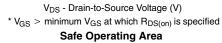
THERMAL RATINGS

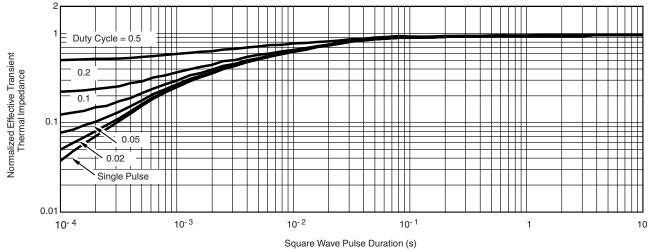




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Maximum Avalanche and Drain Current vs. Case Temperature





Normalized Thermal Transient Impedance, Junction-to-Case

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