Vishay Siliconix





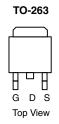
N-Channel 200 V (D-S) 175 °C MOSFET

PRODUCT SUMMARY			
V _{DS} (V)	$R_{DS(on)}\left(\Omega\right)$	I _D (A)	
200	0.270 at V _{GS} = 10 V	9	
200	0.300 at V _{GS} = 6 V	8.5	

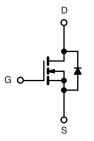
FEATURES

- TrenchFET® Power MOSFETS
- 175 °C Junction Temperature
- Low Thermal Resistance Package
- Compliant to RoHS Directive 2002/95/EC





Ordering Information: SUM09N20-270-E3 (Lead (Pb) free)



N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS (T _C = 25 °C, unless otherwise noted)					
Parameter	Symbol	Limit	Unit		
Drain-Source Voltage	V _{DS}	200	V		
Gate-Source Voltage	V _{GS}	± 20	¬		
Continuous Drain Current (T _{.1} = 175 °C)	T _C = 25 °C	I-	9		
Continuous Diam Current (1) = 175 C)	T _C = 125 °C	I _D	5.2		
Pulsed Drain Current	I _{DM}	10	A		
Avalanche Current	I _{AR}	7			
Repetitive Avalanche Energy ^a	epetitive Avalanche Energy ^a L = 0.1 mH		2.45	mJ	
	T _C = 25 °C	В	60 ^b	14/	
Maximum Power Dissipation ^a	T _A = 25 °C ^c	P _D	3.75	W	
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) ^c	R _{thJA}	40	°C/W		
Junction-to-Case (Drain)	R _{thJC}	2.5	C/ VV		

Notes:

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

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SPECIFICATIONS $(T_J = 25 \degree C)$	C, unless other	erwise noted)					
Parameter	Symbol	Test Conditions	Min.	Тур.	Max.	Unit	
Static				_			
Drain-Source Breakdown Voltage	V_{DS}	$V_{DS} = 0 \text{ V}, I_D = 250 \mu\text{A}$	200			V	
Gate-Threshold Voltage	V _{GS(th)}	$V_{DS} = V_{GS}, I_{D} = 250 \mu A$	2		4		
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0 \text{ V}, V_{GS} = \pm 20 \text{ V}$			± 100	nA	
Zero Gate Voltage Drain Current		$V_{DS} = 160 \text{ V}, V_{GS} = 0 \text{ V}$			1		
	I _{DSS}	$V_{DS} = 160 \text{ V}, V_{GS} = 0 \text{ V}, T_{J} = 125 ^{\circ}\text{C}$			50	μΑ	
		$V_{DS} = 160 \text{ V}, V_{GS} = 0 \text{ V}, T_{J} = 175 ^{\circ}\text{C}$			250		
On-State Drain Current ^a	I _{D(on)}	$V_{DS} \ge 5 \text{ V}, V_{GS} = 10 \text{ V}$	10			Α	
		V _{GS} = 10 V, I _D = 5 A		0.216	0.270		
		V _{GS} = 10 V, I _D = 5 A, T _J = 125 °C			0.54	Ω	
Drain-Source On-State Resistance ^a	R _{DS(on)}	V _{GS} = 10 V, I _D = 5 A, T _J = 175 °C			0.71		
		V _{GS} = 6 V, I _D = 5 A		0.240	0.300		
Forward Transconductance ^a	9 _{fs}	V _{DS} = 15 V, I _D = 5 A		15		S	
Dynamic ^b					<u> </u>		
Input Capacitance	C _{iss}			580		pF	
Output Capacitance	C _{oss}	$V_{GS} = 0 \text{ V}, V_{DS} = 25 \text{ V}, f = 1 \text{ MHz}$		75			
Reverse Transfer Capacitance	C _{rss}			30			
Total Gate Charge ^c	Qg			11	17	nC	
Gate-Source Charge ^c	Q _{gs}	V _{DS} = 100 V, V _{GS} = 10 V, I _D = 10 A		2.7			
Gate-Drain Charge ^c	Q _{gd}			4			
Gate Resistance	R _G			4		Ω	
Turn-On Delay Time ^c	t _{d(on)}			10	15	ns	
Rise Time ^c	t _r	$V_{DD} = 100 \text{ V}, R_1 = 10 \Omega$		35	55		
Turn-Off Delay Time ^c	t _{d(off)}	$I_D \cong 10 \text{ A}, V_{GEN} = 10 \text{ V}, R_G = 2.5 \Omega$		25	40		
Fall Time ^c	t _f			40	60		
Source-Drain Diode Ratings and Cha	aracteristics (T _C = 25 °C) ^b					
Continuous Current	I _S				9		
Pulsed Current	I _{SM}				10	Α	
Forward Voltage ^a	V _{SD}	I _F = 10 A, V _{GS} = 0 V		0.9	1.5	V	
Reverse Recovery Time	t _{rr}	, , , , , ,		100	150	ns	
Peak Reverse Recovery Charge	I _{RM(REC)}	I _F = 10 A, dl/dt = 100 A/μs		5	8	A	
Reverse Recovery Charge	Q _{rr}	3)		0.25	0.6	μC	

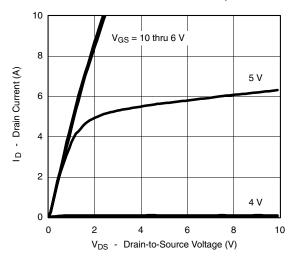
Notes:

- 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.

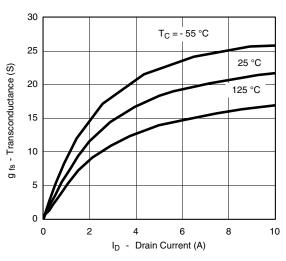
 $Stresses\ beyond\ those\ listed\ under\ ``Absolute\ Maximum\ Ratings''\ may\ cause\ permanent\ damage\ to\ the\ device.\ These\ are\ stress\ ratings\ only,\ and\ functional\ operation$ of the device at these or any other conditions beyond those indicated in the operational sections of the specifications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



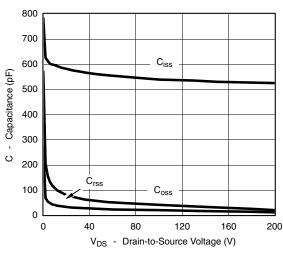
TYPICAL CHARACTERISTICS (25 °C unless noted)



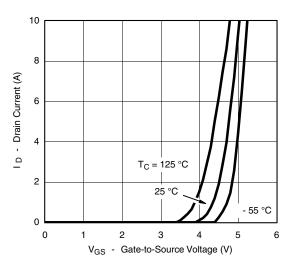
Output Characteristics



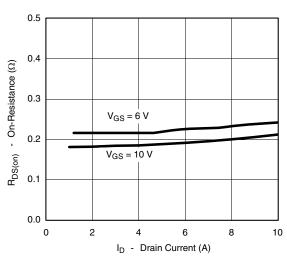
Transconductance



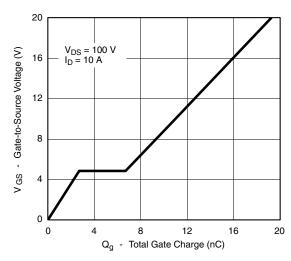
Capacitance



Transfer Characteristics



On-Resistance vs. Drain Current

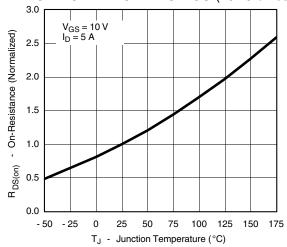


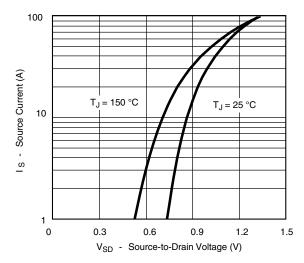
Gate Charge

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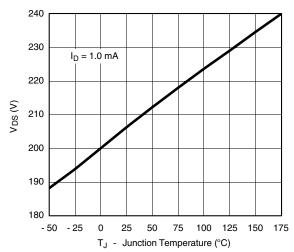
TYPICAL CHARACTERISTICS (25 °C unless noted)





On-Resistance vs. Junction Temperature

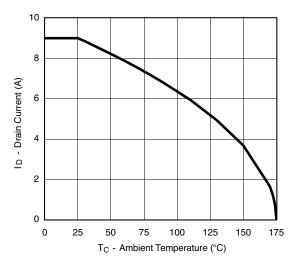
Source-Drain Diode Forward Voltage

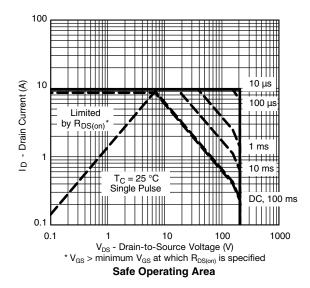


Drain Source Breakdown vs. Junction Temperature

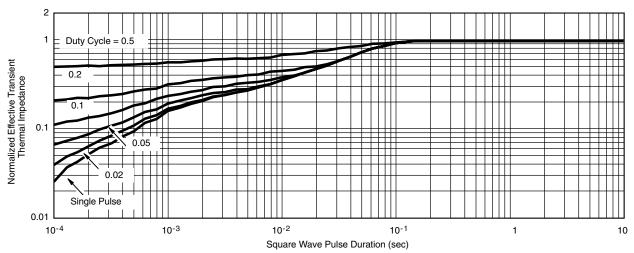


THERMAL RATINGS





Maximum Avalanche and Drain Current vs. Case Temperature



Normalized Thermal Transient Impedance, Junction-to-Case

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