

ANTREX Electronics

Electronic Components Sourcing Information

Product Reference Information

Part Number:	SUP85N04-03-E3
Manufacturer:	Vishay Siliconix
Package:	Please confirm with sales
Availability:	Please confirm with sales

Product Page:

<https://antrexco.com/product/details/vishay-siliconix/sup85n04-03-e3.html>

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New & Original Components

Supplier verification and packaging condition review

CoC / RoHS / REACH documents available on request

Secure sourcing support for OEM / EMS projects

Note:

This PDF includes an ANTREX product reference cover page.

The original manufacturer datasheet follows from the next page.

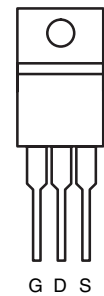
N-Channel 40-V (D-S) 175 °C MOSFET

PRODUCT SUMMARY

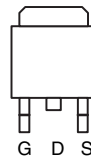
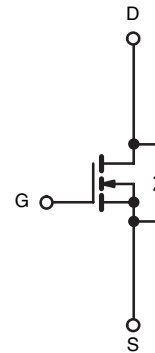
$V_{(BR)DSS}$ (V)	$r_{DS(on)}$ (Ω)	I_D (A)
40	0.0035 at $V_{GS} = 10$ V	85 ^a
	0.0053 at $V_{GS} = 4.5$ V	

FEATURES

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

TO-220AB

Top View
SUP85N04-03

DRAIN connected to TAB

TO-263

Top View
SUB85N04-03


N-Channel MOSFET

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

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	40	V
Gate-Source Voltage	V_{GS}	± 20	
Continuous Drain Current ($T_J = 175$ °C)	I_D	85 ^a	A
		85 ^a	
Pulsed Drain Current	I_{DM}	240	
Avalanche Current	I_{AR}	75	mJ
Repetitive Avalanche Energy ^b	E_{AR}	280	
Maximum Power Dissipation ^b	P_D	250 ^c	W
		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	R_{thJA}	40	°C/W
		62.5	
Junction-to-Case	R_{thJC}	0.6	

Notes:

a. Package limited.

b. Duty cycle ≤ 1 %.

c. See SOA curve for voltage derating.

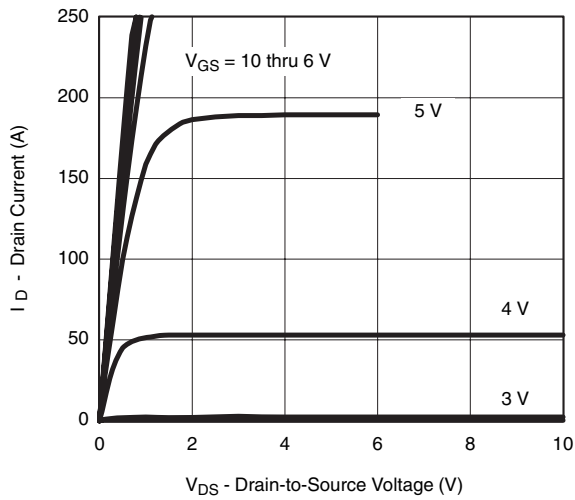
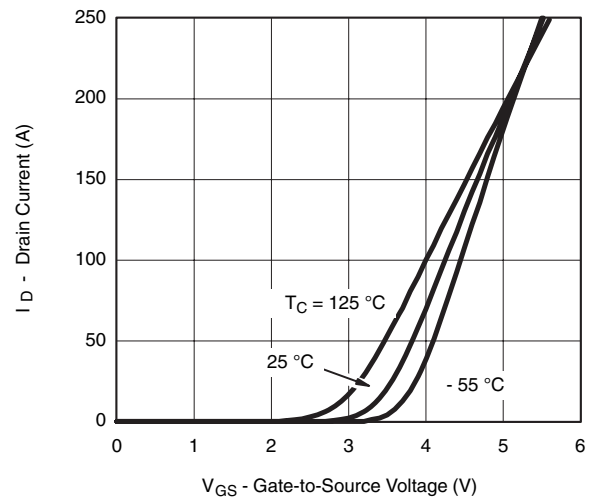
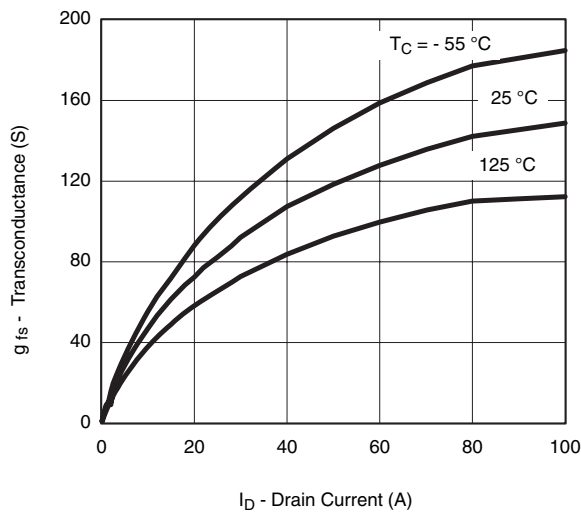
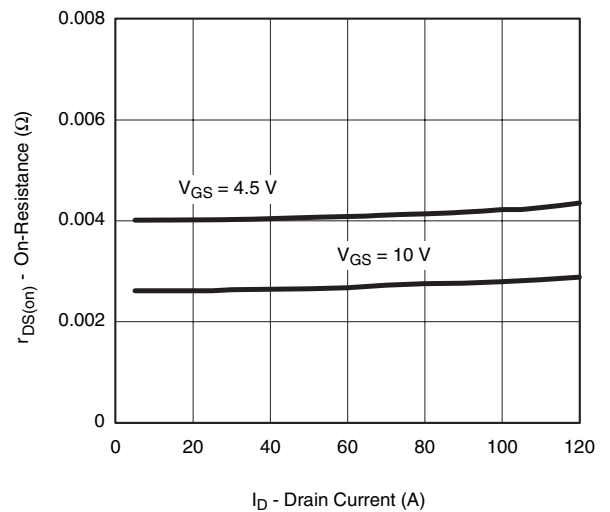
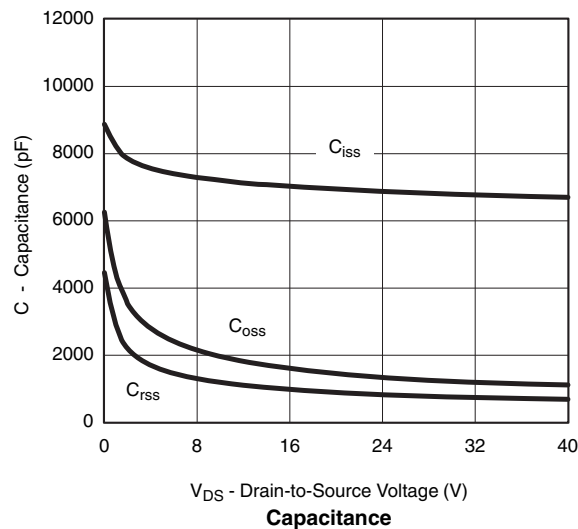
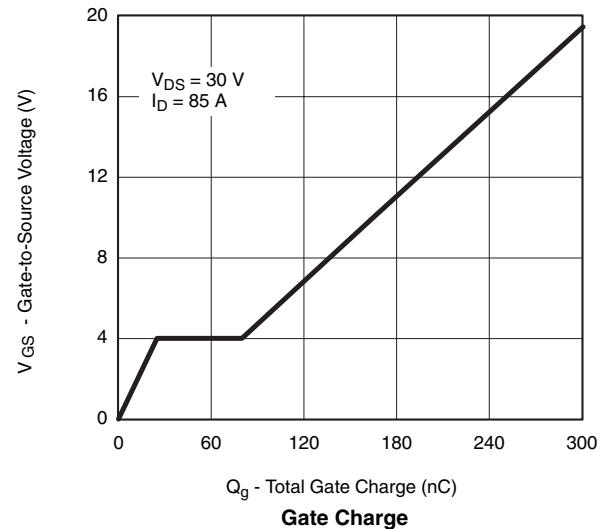
d. When mounted on 1" square PCB (FR-4 material).

SPECIFICATIONS $T_J = 25\text{ }^{\circ}\text{C}$, unless otherwise noted						
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{DS} = 0\text{ V}$, $I_D = 250\text{ }\mu\text{A}$	40			V
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}$, $I_D = 250\text{ }\mu\text{A}$	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	I_{DSS}	$V_{DS} = 40\text{ V}$, $V_{GS} = 0\text{ V}$			1	μA
		$V_{DS} = 40\text{ V}$, $V_{GS} = 0\text{ V}$, $T_J = 125\text{ }^{\circ}\text{C}$			50	
		$V_{DS} = 40\text{ V}$, $V_{GS} = 0\text{ V}$, $T_J = 175\text{ }^{\circ}\text{C}$			250	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} \geq 5\text{ V}$, $V_{GS} = 10\text{ V}$	120			A
Drain-Source On-State Resistance ^a	$r_{DS(on)}$	$V_{GS} = 10\text{ V}$, $I_D = 30\text{ A}$		0.0029	0.0035	Ω
		$V_{GS} = 4.5\text{ V}$, $I_D = 20\text{ A}$		0.0044	0.0053	
		$V_{GS} = 10\text{ V}$, $I_D = 30\text{ A}$, $T_J = 125\text{ }^{\circ}\text{C}$			0.0053	
		$V_{GS} = 10\text{ V}$, $I_D = 30\text{ A}$, $T_J = 175\text{ }^{\circ}\text{C}$			0.0063	
Forward Transconductance ^a	g_{fs}	$V_{DS} = 15\text{ V}$, $I_D = 30\text{ A}$	30			S
Dynamic ^b						
Input Capacitance	C_{iss}	$V_{GS} = 0\text{ V}$, $V_{DS} = 25\text{ V}$, $f = 1\text{ MHz}$		6860		pF
Output Capacitance	C_{oss}			1320		
Reverse Transfer Capacitance	C_{rss}			800		
Total Gate Charge ^c	Q_g	$V_{DS} = 30\text{ V}$, $V_{GS} = 10\text{ V}$, $I_D = 85\text{ A}$		165	250	nC
Gate-Source Charge ^c	Q_{gs}			25		
Gate-Drain Charge ^c	Q_{gd}			55		
Turn-On Delay Time ^c	$t_{d(on)}$	$V_{DD} = 30\text{ V}$, $R_L = 0.35\text{ }\Omega$ $I_D \cong 85\text{ A}$, $V_{GEN} = 10\text{ V}$, $R_G = 2.5\text{ }\Omega$		15	25	ns
Rise Time ^c	t_r			90	135	
Turn-Off Delay Time ^c	$t_{d(off)}$			95	145	
Fall Time ^c	t_f			125	195	
Source-Drain Diode Ratings and Characteristics ($T_C = 25\text{ }^{\circ}\text{C}$) ^b						
Continuous Current	I_S				85	A
Pulsed Current	I_{SM}				240	
Forward Voltage ^a	V_{SD}	$I_F = 85\text{ A}$, $V_{GS} = 0\text{ V}$		1.1	1.4	V
Reverse Recovery Time	t_{rr}	$I_F = 85\text{ A}$, $di/dt = 100\text{ A}/\mu\text{s}$		60	90	ns
Peak Reverse Recovery Current	$I_{RM(REC)}$			2.6	4	A
Reverse Recovery Charge	Q_{rr}			0.08	0.15	μC

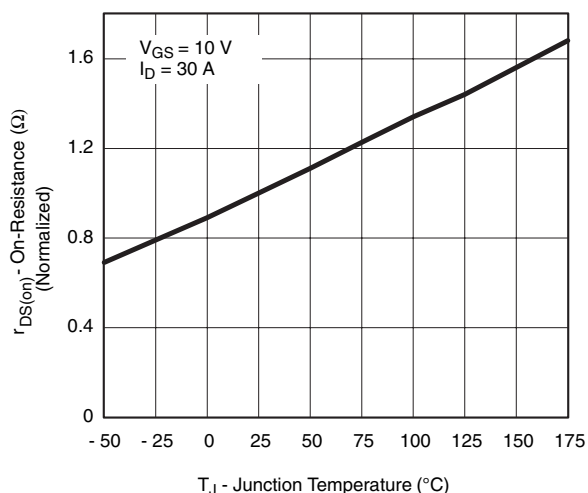
Notes:

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

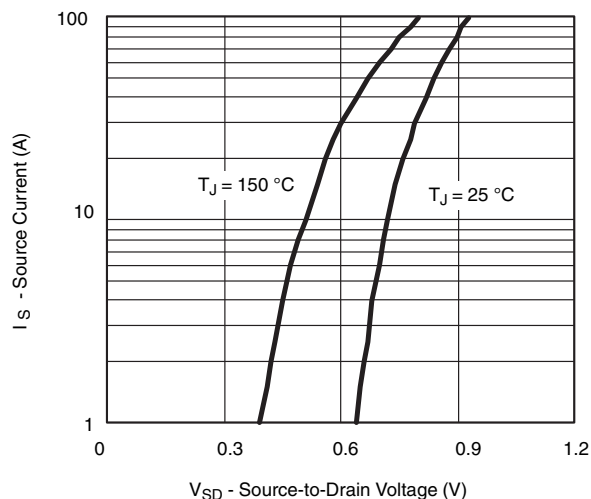
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure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

TYPICAL CHARACTERISTICS 25 °C, unless noted

Output Characteristics

Transfer Characteristics

Transconductance

On-Resistance vs. Drain Current

Capacitance

Gate Charge

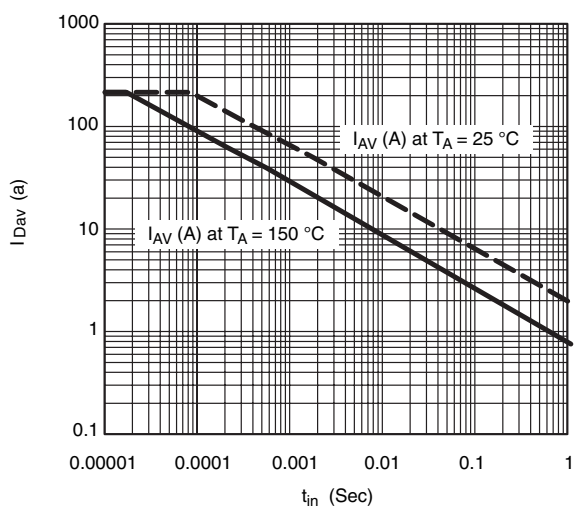
TYPICAL CHARACTERISTICS 25 °C, unless noted



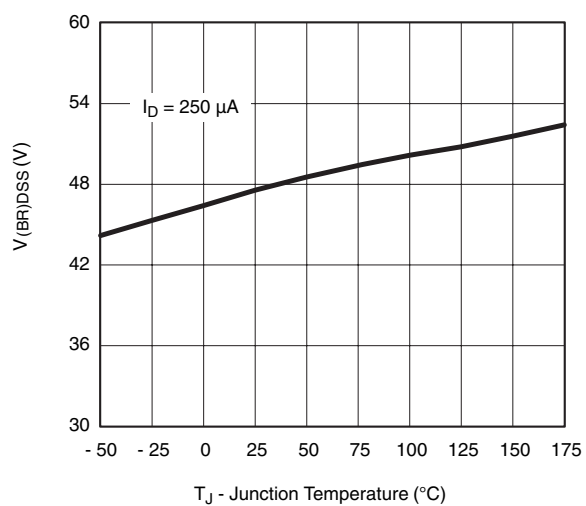
On-Resistance vs. Junction Temperature



Source-Drain Diode Forward Voltage

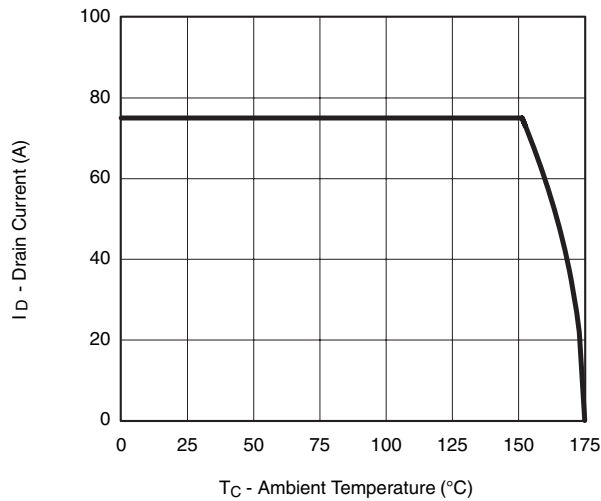


Avalanche Current vs. Time

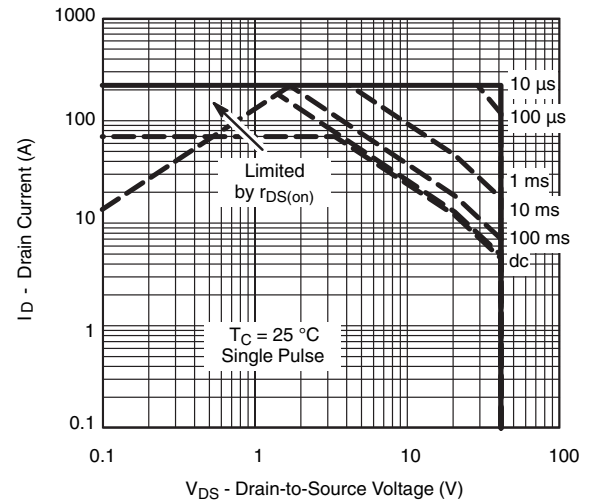


Drain Source Breakdown vs. Junction Temperature

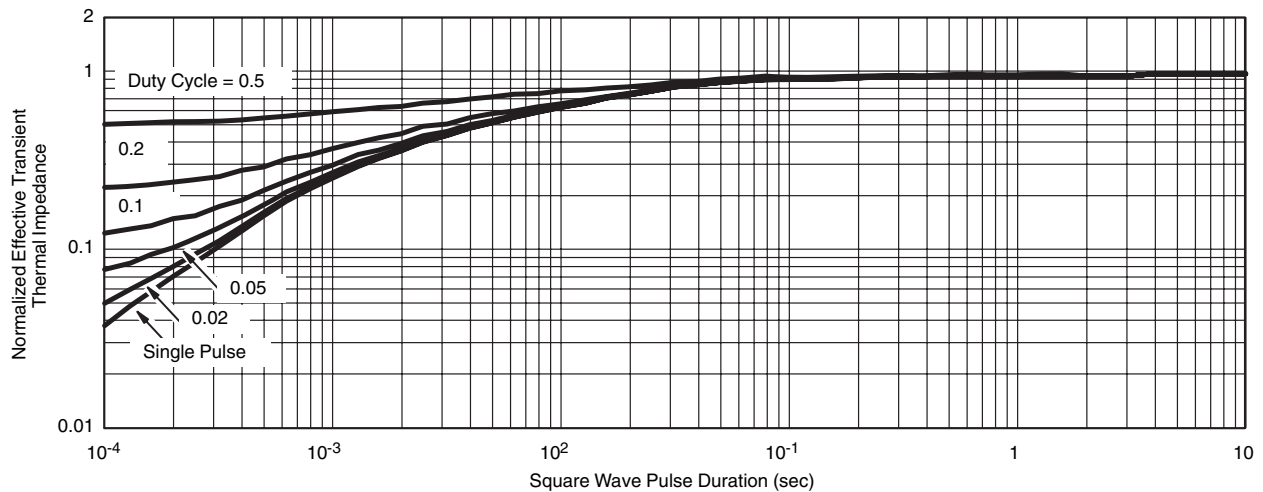
THERMAL RATINGS



Maximum Avalanche and Drain Current vs. Case Temperature



Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Case

Vishay Siliconix maintains worldwide manufacturing capability. Products may be manufactured at one of several qualified locations. Reliability data for Silicon Technology and Package Reliability represent a composite of all qualified locations. For related documents such as package/tape drawings, part marking, and reliability data, see <http://www.vishay.com/ppg?71124>.



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