N-Channel 30-V (D-S) 175°C MOSFET

PRODUCT SUMMARY		
$V_{(BR)DSS}$ (V)	$r_{DS(on)}$ (Ω)	I_D (A)[a]
30	0.0026 @ V_{GS} = 10 V	110[a]
	0.004 @ V_{GS} = 4.5 V	110[a]

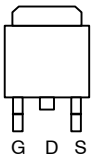
FEATURES

- TrenchFET® Power MOSFET
- 175°C Junction Temperature
- Optimized for Low-Side Synchronous Rectifier
- 100% R_g Tested

APPLICATIONS

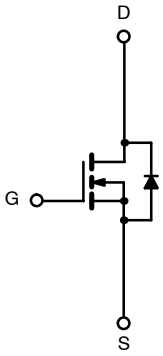
- Desktop or Server CPU Core

TO-263



Top View

DRAIN connected to TAB



N-Channel MOSFET

Ordering Information: SUM110N03-03P
SUM110N03-03P-E3 (Lead Free)

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C UNLESS OTHERWISE NOTED)				
Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	30	V
Gate-Source Voltage		V_{GS}	±20	
Continuous Drain Current (T_J = 175°C)	T_C = 25°C	I_D	110[a]	A
	T_C = 100°C		110[a]	
Pulsed Drain Current		I_{DM}	400	
Avalanche Current		I_{AR}	65	
Repetitive Avalanche Energy[b]	L = 0.1 mH	E_{AR}	211	mJ
Maximum Power Dissipation[b]	T_C = 25°C (TO-220AB and TO-263)	P_D	375[c]	W
	T_A = 25°C (TO-263)[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)[d]	R_{thJA}	40	°C/W
	Free Air (TO-220AB)		62.5	
Junction-to-Case		R_{thJC}	0.4	

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).

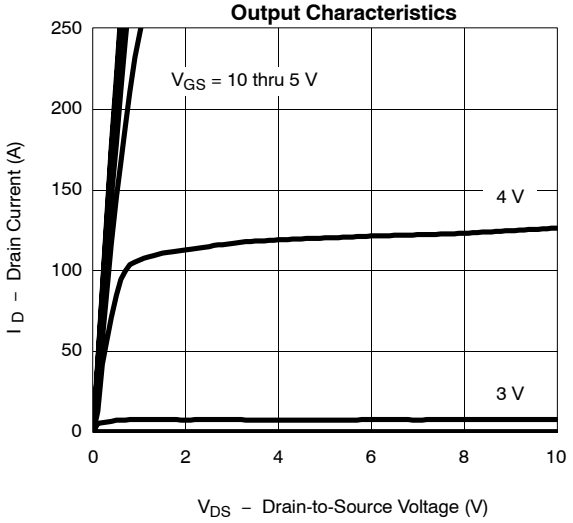
SPECIFICATIONS (T_J =25°C UNLESS OTHERWISE NOTED)

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{DS} = 0 V, I_D = 250 μA	30			V
Gate-Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 μA	1	2	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} = 30 V, V_{GS} = 0 V			1	μA
		V_{DS} = 30 V, V_{GS} = 0 V, T_J = 125°C			50	
		V_{DS} = 30 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		0.002	0.0026	Ω
		V_{GS} = 10 V, I_D = 30 A, T_J = 125°C			0.004	
		V_{GS} = 10 V, I_D = 30 A, T_J = 175°C			0.005	
		V_{GS} = 4.5 V, I_D = 20 A		0.0031	0.004	
Forward Transconductance[a]	g_{fs}	V_{DS} = 15 V, I_D = 30 A	20			S
Dynamic[b]						
Input Capacitance	C_{iss}	V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz		12100		pF
Output Capacitance	C_{oss}			1910		
Reverse Transfer Capacitance	C_{rss}			1250		
Total Gate Charge[b]	Q_g	V_{DS} = 15 V, V_{GS} = 10 V, I_D = 110 A		172	250	nC
Gate-Source Charge[b]	Q_{gs}			40		
Gate-Drain Charge[b]	Q_{gd}			22		
Gate Resistance	R_g		0.3	1.3	1.9	Ω
Turn-On Delay Time[b]	$t_{d(on)}$	V_{DD} = 15 V, R_L = 0.18 Ω I_D ≅ 110 A, V_{GEN} = 10 V, R_g = 2.5 Ω		20	35	ns
Rise Time[b]	t_r			20	35	
Turn-Off Delay Time[b]	$t_{d(off)}$			90	140	
Fall Time[b]	t_f			25	40	
Source-Drain Diode Ratings and Characteristics (T_C = 25°C)[c]						
Continuous Current	I_S				85	A
Pulsed Current	I_{SM}				440	
Forward Voltage[a]	V_{SD}	I_F = 110 A, V_{GS} = 0 V		1.1	1.5	V
Reverse Recovery Time	t_{rr}	I_F = 85 A, di/dt = 100 A/μs		60	120	ns
Peak Reverse Recovery Current	I_{RM}			3.5	5	A
Reverse Recovery Charge	Q_{rr}			0.1	0.3	μC

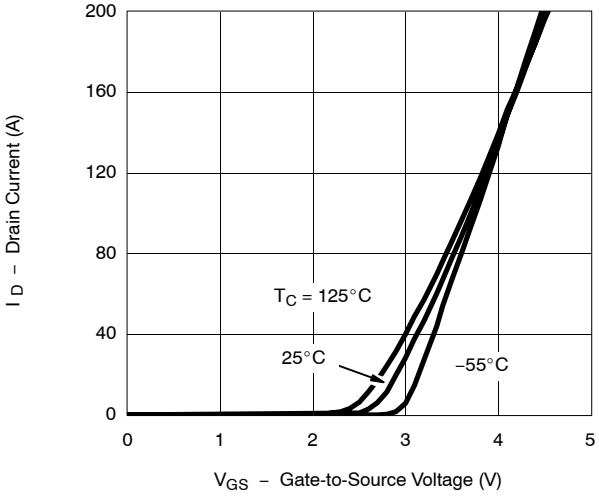
Notes
a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.
b. Independent of operating temperature.
c. Guaranteed by design, not subject to production testing.

TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

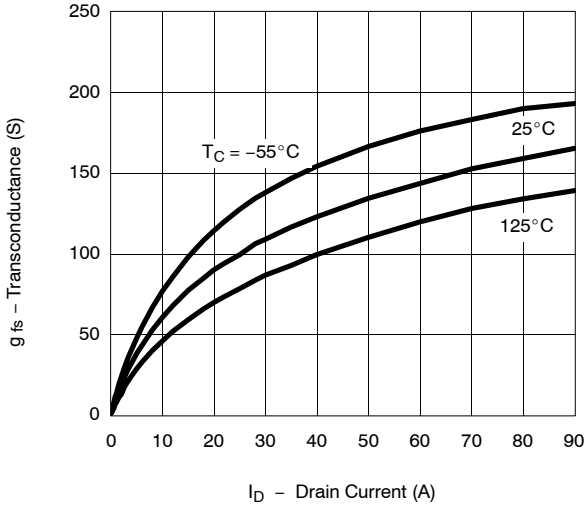
Output Characteristics



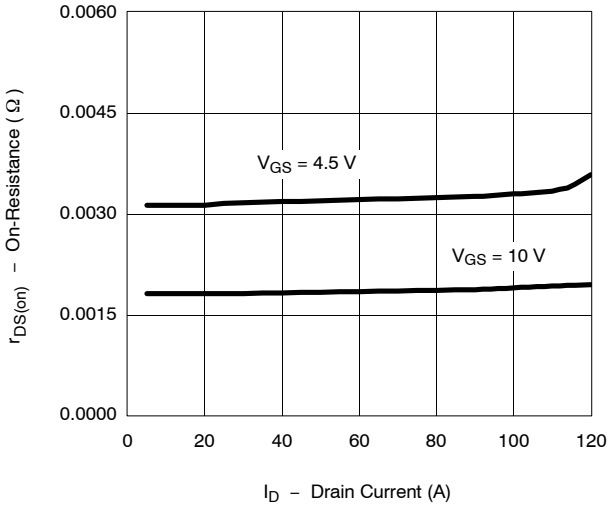
Transfer Characteristics



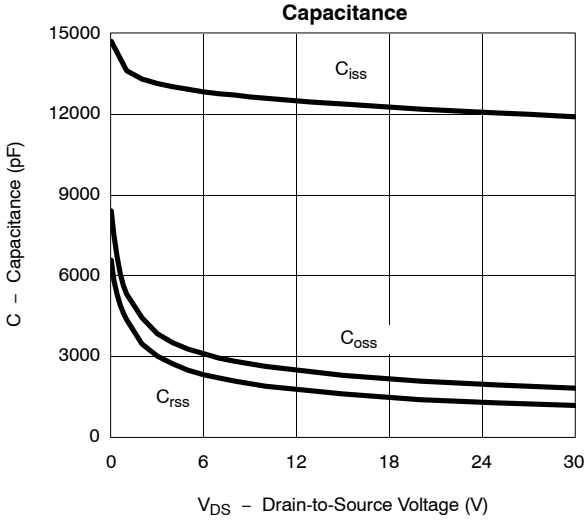
Transconductance



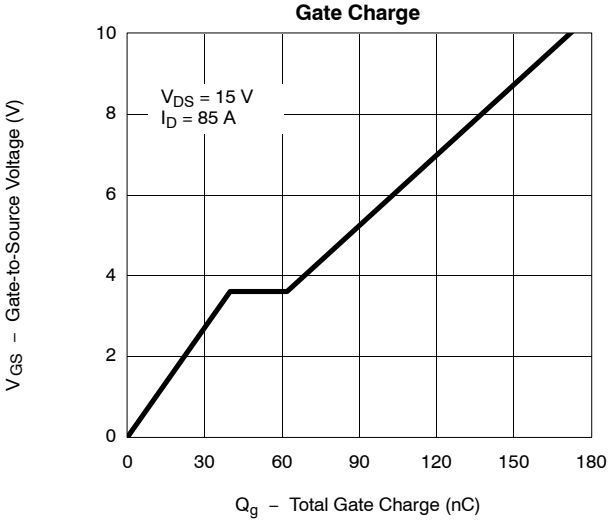
On-Resistance vs. Drain Current



Capacitance

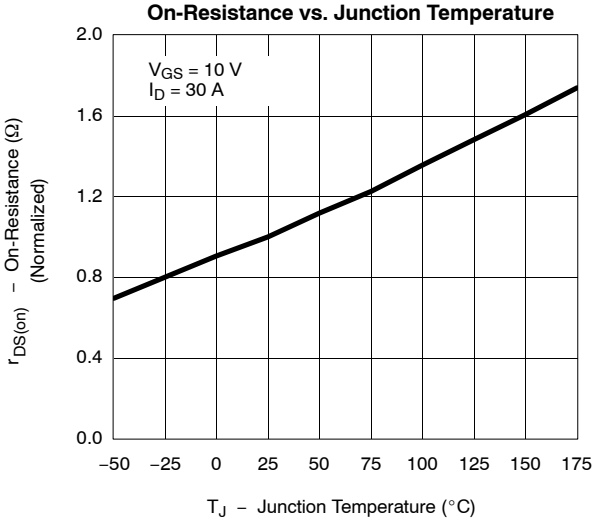


Gate Charge

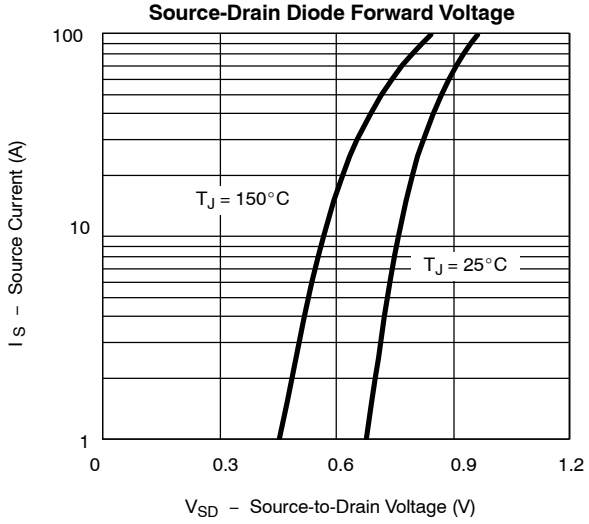


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

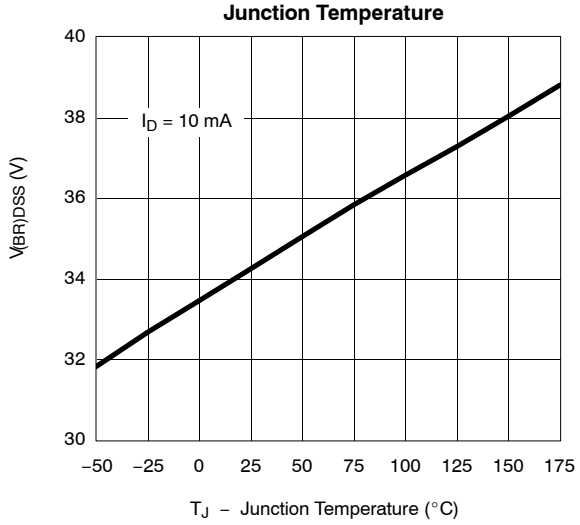
On-Resistance vs. Junction Temperature



Source-Drain Diode Forward Voltage

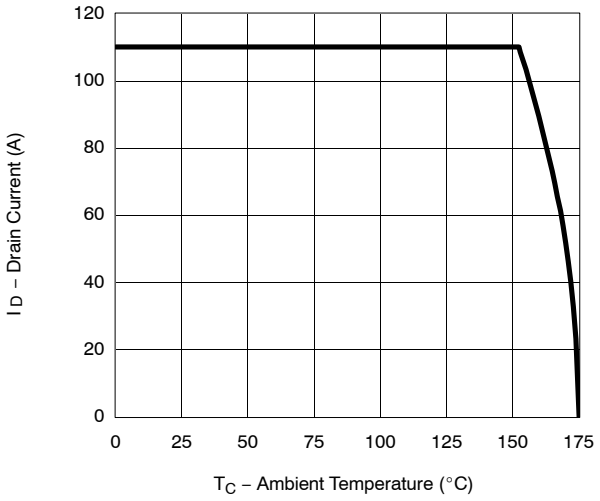


Drain Source Breakdown vs. Junction Temperature

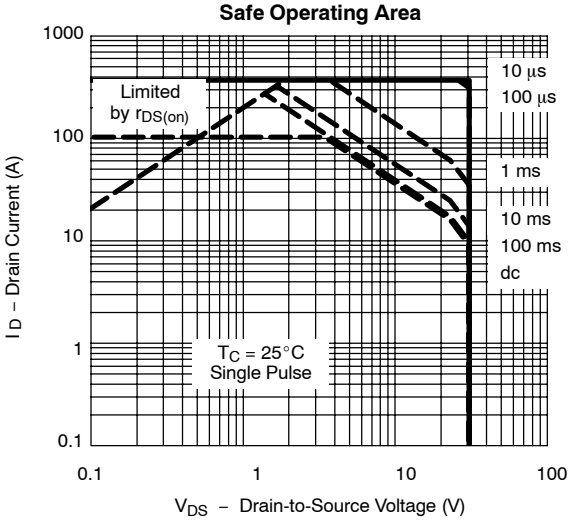


THERMAL RATINGS

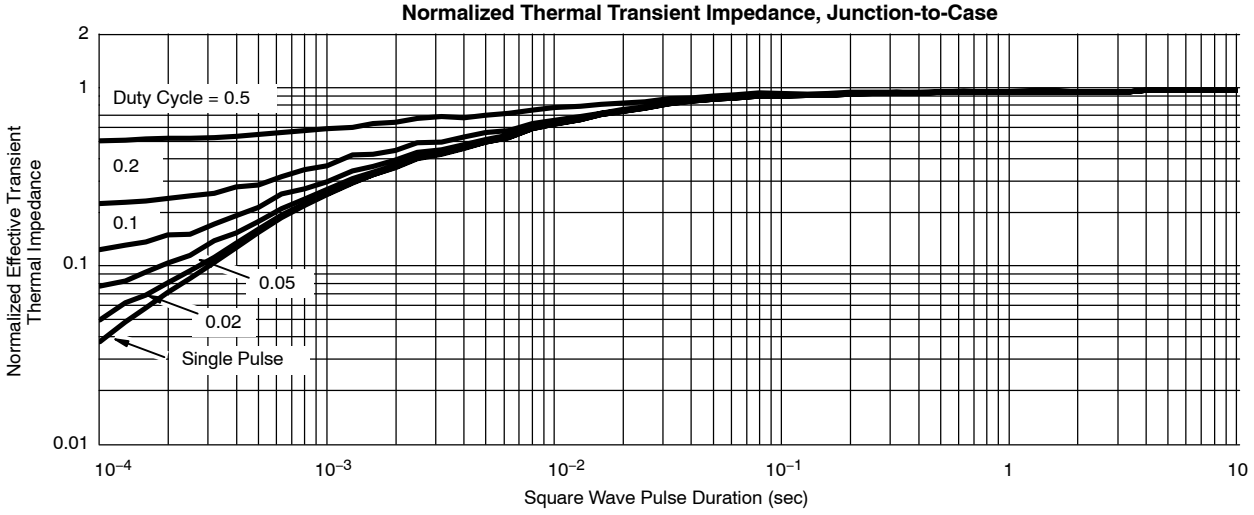
Maximum Avalanche and Drain Current vs. Case Temperature



Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Case



Disclaimer

All product specifications and data are subject to change without notice.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, “Vishay”), disclaim any and all liability for any errors, inaccuracies or incompleteness contained herein or in any other disclosure relating to any product.

Vishay disclaims any and all liability arising out of the use or application of any product described herein or of any information provided herein to the maximum extent permitted by law. The product specifications do not expand or otherwise modify Vishay’s terms and conditions of purchase, including but not limited to the warranty expressed therein, which apply to these products.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications unless otherwise expressly indicated. Customers using or selling Vishay products not expressly indicated for use in such applications do so entirely at their own risk and agree to fully indemnify Vishay for any damages arising or resulting from such use or sale. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

Product names and markings noted herein may be trademarks of their respective owners.

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

Vishay:
SUM110N03-03P-E3