

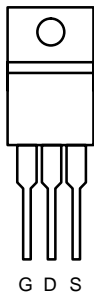


N-Channel 30-V (D-S), 175°C, MOSFET PWM Optimized

PRODUCT SUMMARY		
$V_{(BR)DSS}$ (V)	$r_{DS(on)}$ (Ω)	I_D (A)
30	0.009 @ $V_{GS} = 10$ V	$\pm 70^a$
	0.015 @ $V_{GS} = 4.5$ V	± 55

175°C Rated
Maximum Junction Temperature
TrenchFET®
Power MOSFETs

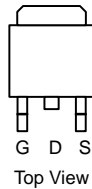
TO-220AB



Top View

SUP70N03-09

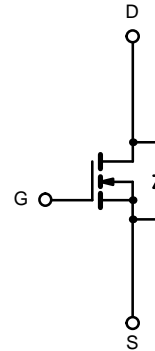
TO-263



Top View

SUB70N03-09

DRAIN connected to TAB



N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS ($T_C = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)			
Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	± 30	V
Gate-Source Voltage	V_{GS}	± 20	
Continuous Drain Current ($T_J = 175^\circ\text{C}$)	I_D	$T_C = 25^\circ\text{C}$	$\pm 70^a$
		$T_C = 100^\circ\text{C}$	± 50
Pulsed Drain Current	I_{DM}	± 180	A
Avalanche Current	I_{AR}	± 45	
Repetitive Avalanche Energy ^b	E_{AR}	101	mJ
Power Dissipation	P_D	93 ^c	W
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}	1.6	$^\circ\text{C/W}$

Notes:

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



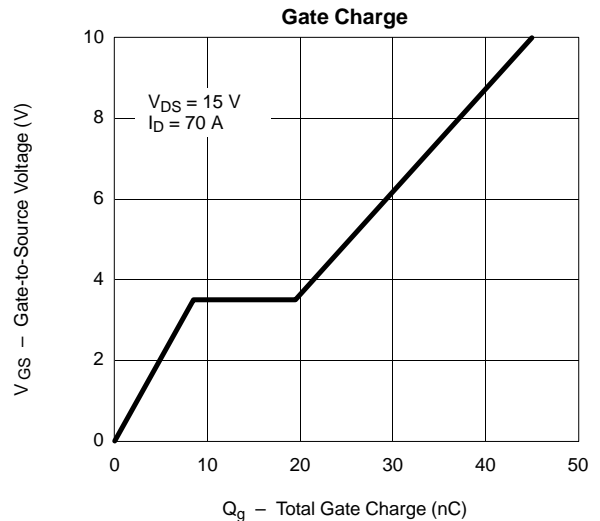
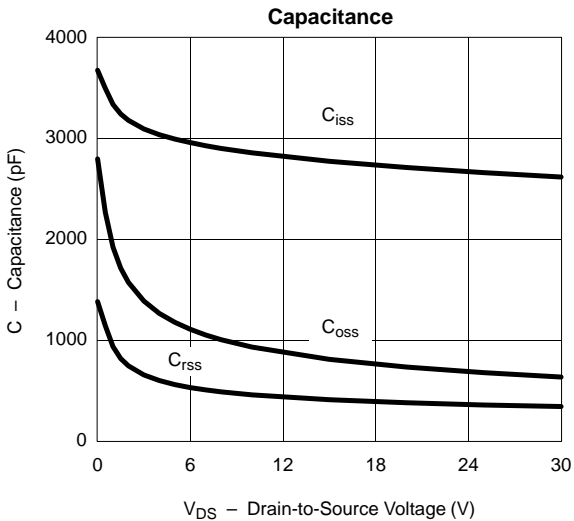
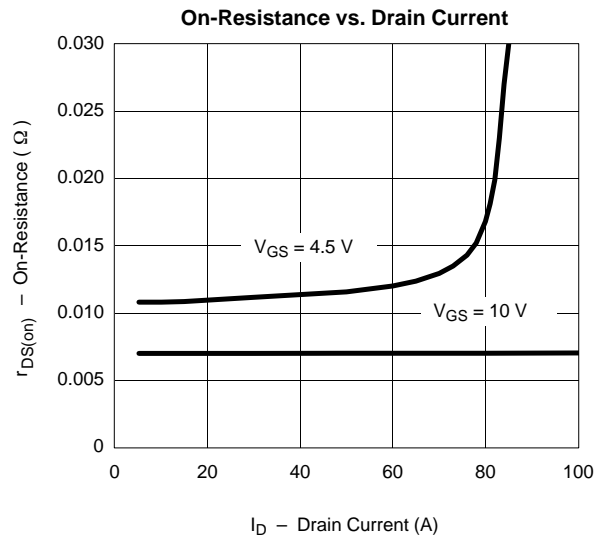
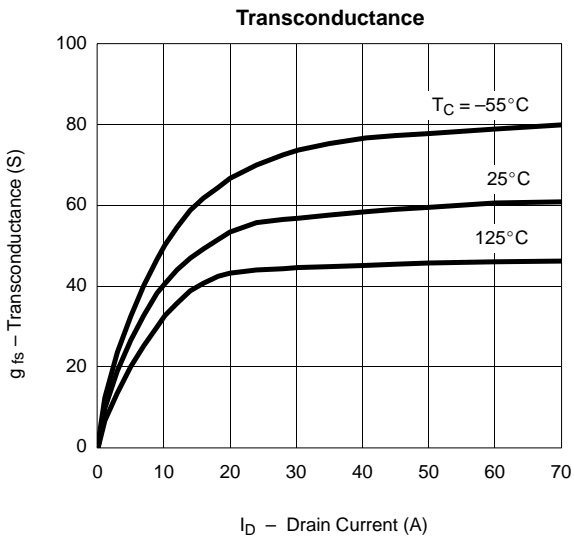
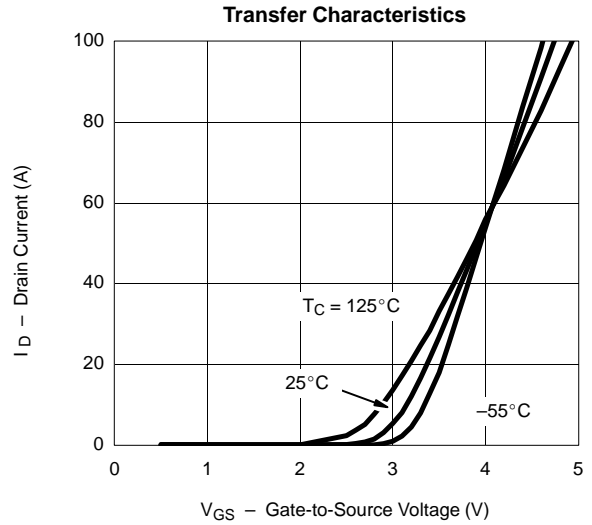
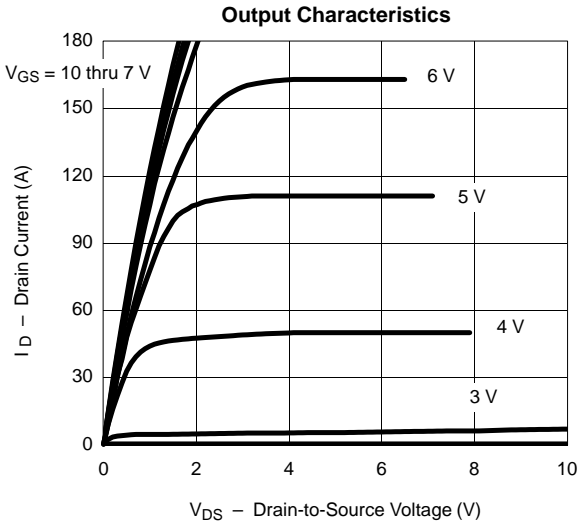
MOSFET SPECIFICATIONS (T _J = 25°C UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} = 0 V, I _D = 250 μA	30			V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _{DS} = 250 μA	1	2		
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ±20 V			±100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 24 V, V _{GS} = 0 V			1	μA
		V _{DS} = 24 V, V _{GS} = 0 V, T _J = 125°C			50	
		V _{DS} = 24 V, V _{GS} = 0 V, T _J = 175°C			150	
On-State Drain Current ^a	I _{D(on)}	V _{DS} = 5 V, V _{GS} = 10 V	70			A
Drain-Source On-State Resistance ^a	r _{DS(on)}	V _{GS} = 10 V, I _D = 30 A		0.007	0.009	Ω
		V _{GS} = 10 V, I _D = 30 A, T _J = 125°C			0.0135	
		V _{GS} = 10 V, I _D = 30 A, T _J = 175°C			0.017	
		V _{GS} = 4.5 V, I _D = 20 A		0.011	0.015	
Forward Transconductance ^a	g _{fs}	V _{DS} = 15 V, I _D = 30 A	30	60		S
Dynamic^b						
Input Capacitance	C _{iss}	V _{GS} = 0 V, V _{DS} = 25 V, f = 1 MHz		2700		pF
Output Capacitance	C _{oss}			680		
Reverse Transfer Capacitance	C _{rss}			360		
Total Gate Charge ^c	Q _g	V _{DS} = 15 V, V _{GS} = 10 V, I _D = 70 A		45	70	nC
Gate-Source Charge ^c	Q _{gs}			8.5		
Gate-Drain Charge ^c	Q _{gd}			11		
Turn-On Delay Time ^c	t _{d(on)}	V _{DD} = 15 V, R _L = 0.21 Ω I _D = 70 A, V _{GEN} = 10 V, R _G = 2.5 Ω		13	20	ns
Rise Time ^c	t _r			7	15	
Turn-Off Delay Time ^c	t _{d(off)}			35	60	
Fall Time ^c	t _f			12	20	
Source-Drain Diode Ratings and Characteristics (T_C = 25°C)^b						
Continuous Current	I _S				70	A
Pulsed Current	I _{SM}				180	
Forward Voltage ^a	V _{SD}	I _F = 70 A, V _{GS} = 0 V		1.2	1.5	V
Reverse Recovery Time	t _{rr}	I _F = 70 A, di/dt = 100 A/μs		35	70	ns

Notes:

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

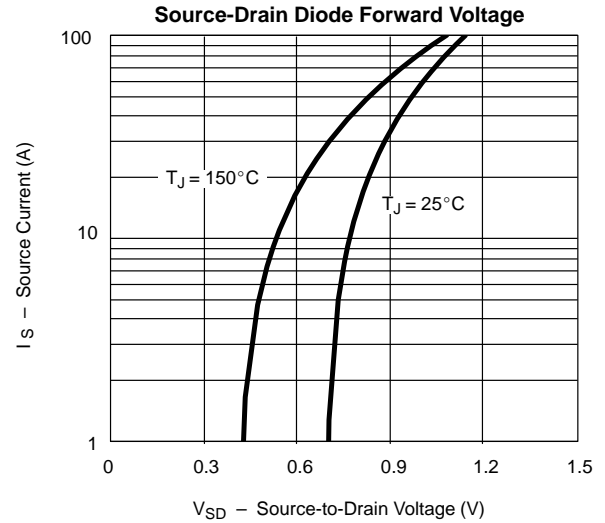
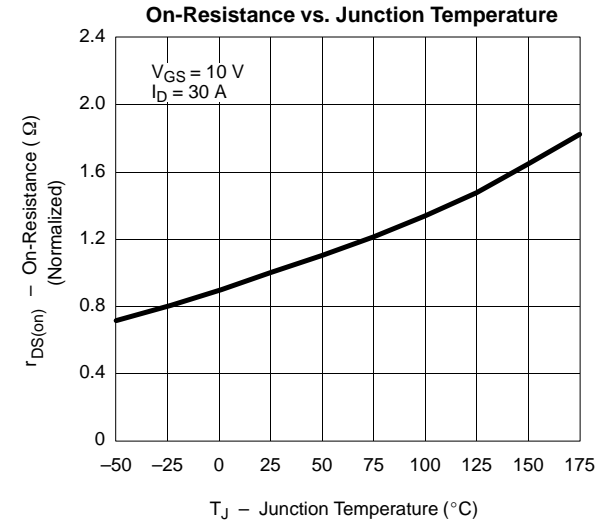


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

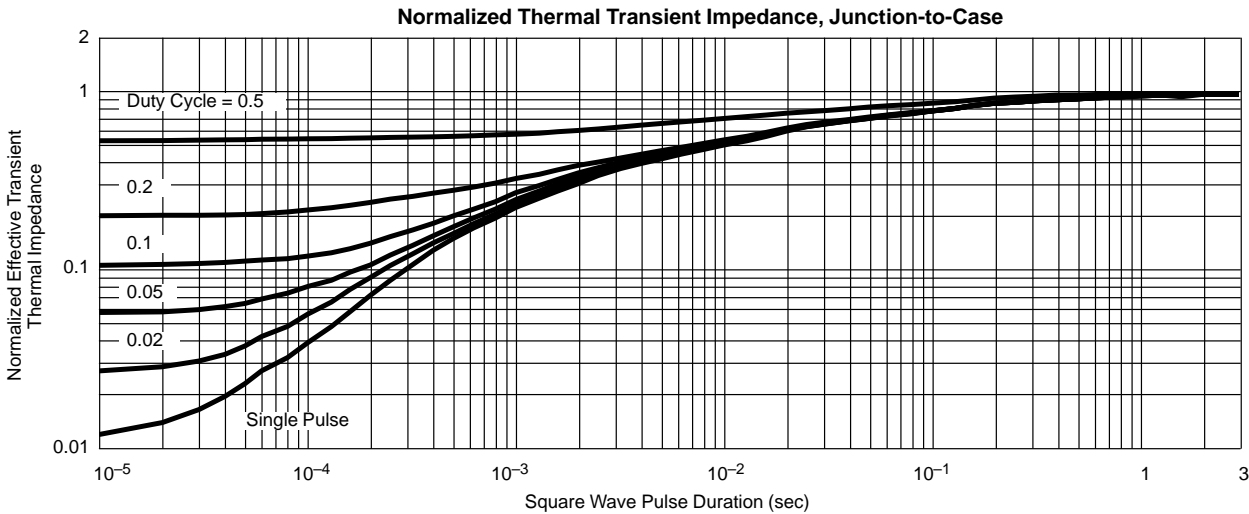
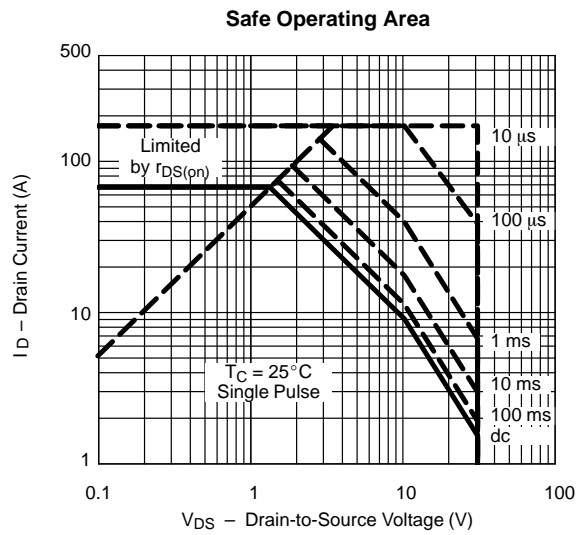
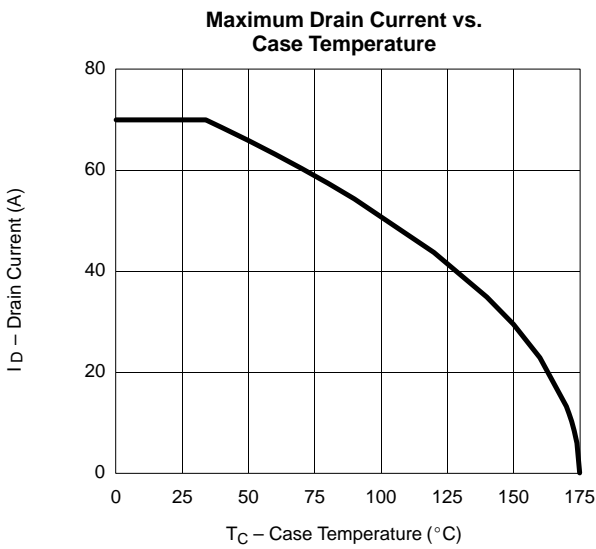




TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)



THERMAL RATINGS





Notice

Specifications of the products displayed herein are subject to change without notice. Vishay Intertechnology, Inc., or anyone on its behalf, assumes no responsibility or liability for any errors or inaccuracies.

Information contained herein is intended to provide a product description only. No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document. Except as provided in Vishay's terms and conditions of sale for such products, Vishay assumes no liability whatsoever, and disclaims any express or implied warranty, relating to sale and/or use of Vishay products including liability or warranties relating to fitness for a particular purpose, merchantability, or infringement of any patent, copyright, or other intellectual property right.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications. Customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Vishay for any damages resulting from such improper use or sale.



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.