



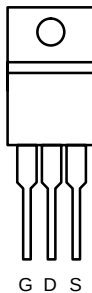
N-Channel 30-V (D-S), 175°C, MOSFET PWM Optimized

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

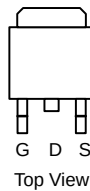


Top View

SUP70N03-09

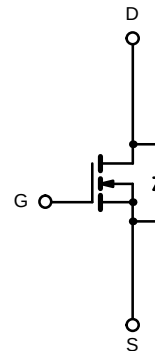
DRAIN connected to TAB

TO-263



Top View

SUB70N03-09



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 ($T_J = 175^\circ\text{C}$)	$T_C = 25^\circ\text{C}$	I_D	$\pm 70^a$	A
	$T_C = 100^\circ\text{C}$		± 50	
Pulsed Drain Current		I_{DM}	± 180	
Avalanche Current		I_{AR}	± 45	
Repetitive Avalanche Energy ^b	$L = 0.1$ mH	E_{AR}	101	mJ
Power Dissipation	$T_C = 25^\circ\text{C}$	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	PCB Mount (TO-263) ^d	R_{thJA}	40	$^\circ\text{C/W}$
	Free Air (TO-220AB)		62.5	
Junction-to-Case		R_{thJC}	1.6	

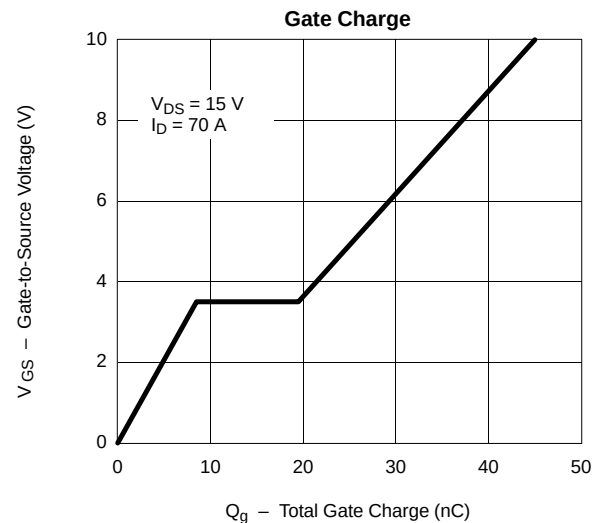
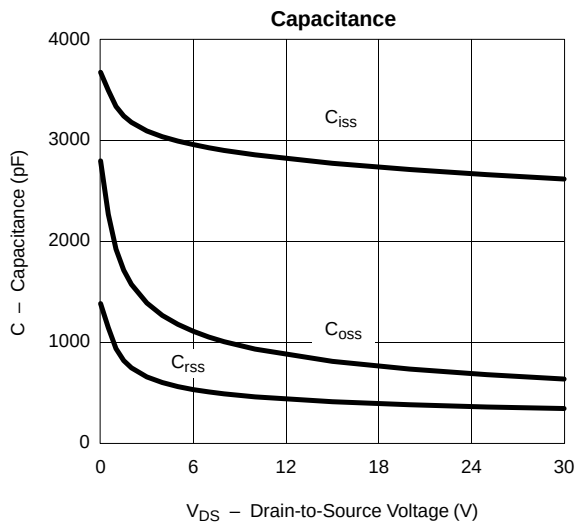
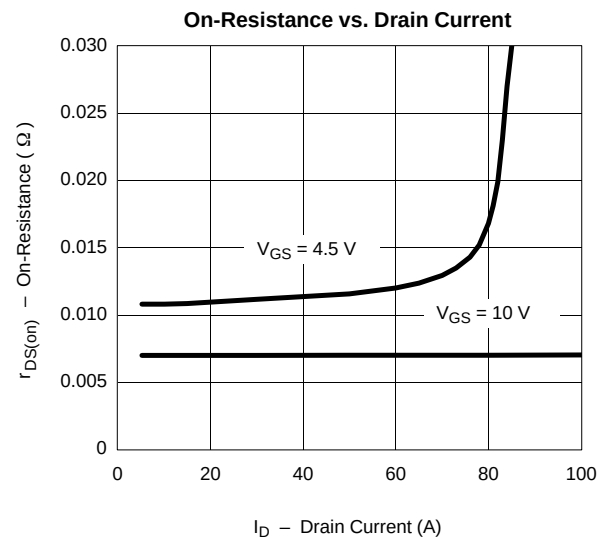
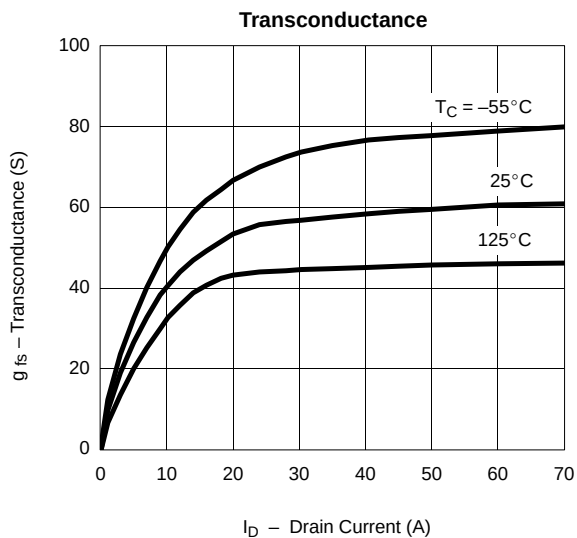
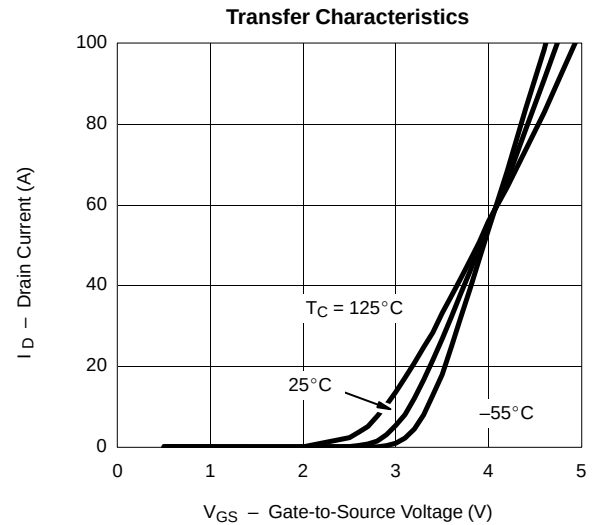
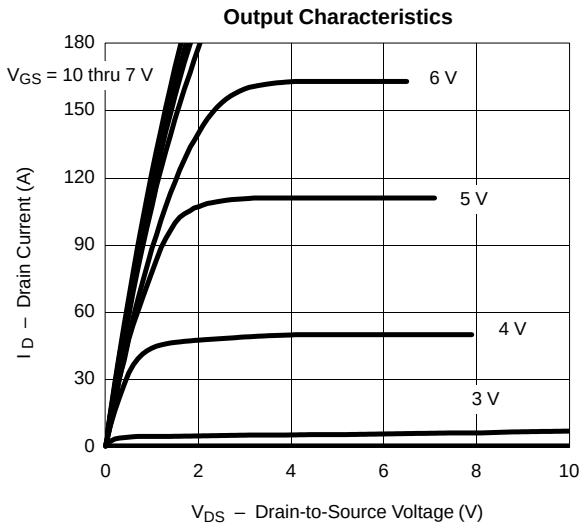
Notes:

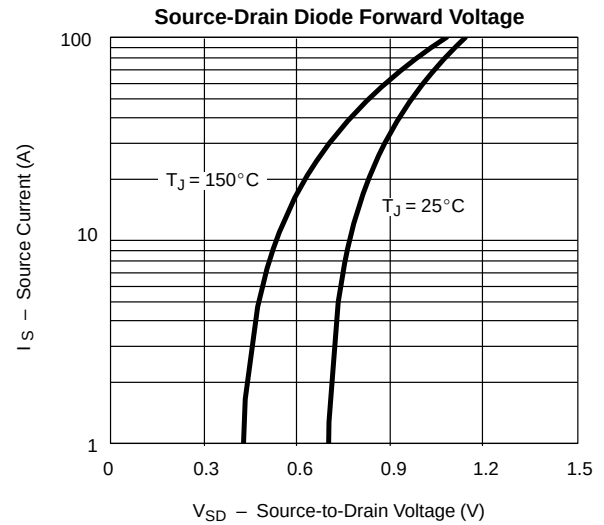
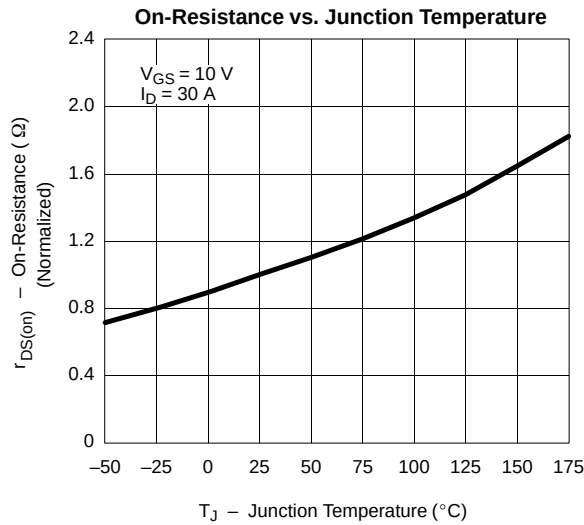
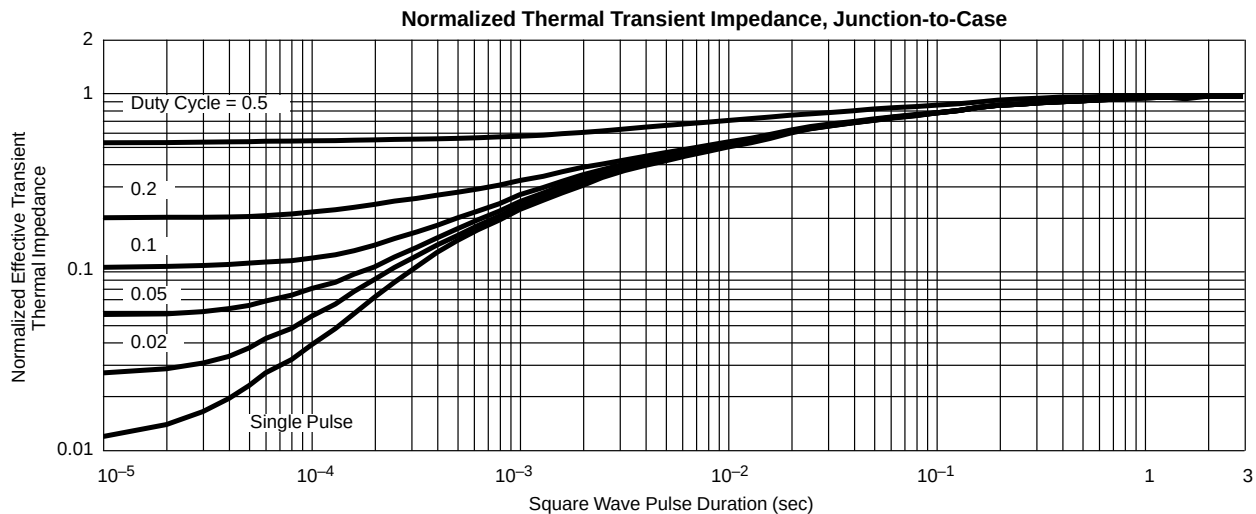
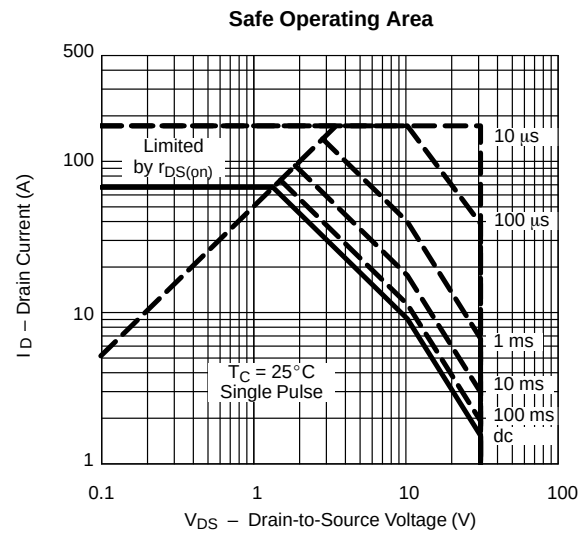
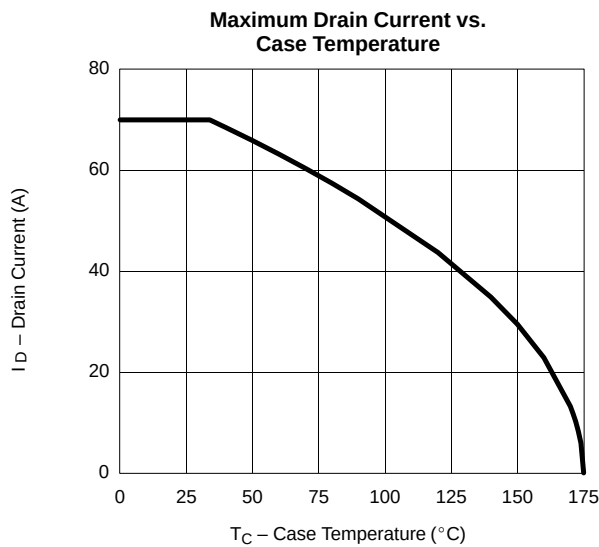
- Package limited.
- Duty cycle $\leq 1\%$.
- See SOA curve for voltage derating.
- When mounted on 1" square PCB (FR-4 material).

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 $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.
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**



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