

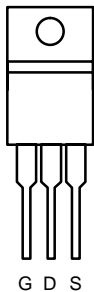


N-Channel 30-V (D-S), 175°C, MOSFET PWM Optimized

PRODUCT SUMMARY		
$V_{(BR)DSS}$ (V)	$r_{DS(on)}$ (Ω)	I_D (A)
30	0.009 @ $V_{GS} = 10\text{ V}$	70 ^a
	0.013 @ $V_{GS} = 4.5\text{ V}$	60

175°C Rated
Maximum Junction Temperature
TrenchFET®
Power MOSFETS

TO-220AB

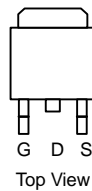


Top View

SUP70N03-09BP

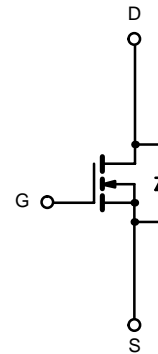
DRAIN connected to TAB

TO-263



Top View

SUB70N03-09BP



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	$T_C = 25^\circ\text{C}$	70 ^b
		$T_C = 100^\circ\text{C}$	50
Pulsed Drain Current	I_{DM}	200	A
Avalanche Current	I_{AR}	30	
Repetitive Avalanche Energy ^a	E_{AR}	61	mJ
Power Dissipation	P_D	93 ^b	
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) ^c	40
		Free Air (TO-220AB)	62.5
Junction-to-Case	R_{thJC}	1.6	$^\circ\text{C/W}$

Notes:

- a. Duty cycle $\leq 1\%$.
- b. See SOA curve for voltage derating.
- c. 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	0.8		2.0	
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		0.010	0.013	
Forward Transconductance ^a	g _{fs}	V _{DS} = 15 V, I _D = 30 A	20	45		S
Dynamic^b						
Input Capacitance	C _{iss}	V _{GS} = 0 V, V _{DS} = 25 V, f = 1 MHz		1500		pF
Output Capacitance	C _{oss}			530		
Reverse Transfer Capacitance	C _{rss}			240		
Total Gate Charge ^c	Q _g	V _{DS} = 15 V, V _{GS} = 5 V, I _D = 70 A		15.5	19	nC
Gate-Source Charge ^c	Q _{gs}			5		
Gate-Drain Charge ^c	Q _{gd}			6		
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		10	18	ns
Rise Time ^c	t _r			8	15	
Turn-Off Delay Time ^c	t _{d(off)}			25	45	
Fall Time ^c	t _f			9	16	
Gate Resistance	R _g				2	
Source-Drain Diode Ratings and Characteristics (T_C = 25 °C)^b						
Continuous Current	I _S				70	A
Pulsed Current	I _{SM}				200	
Forward Voltage ^a	V _{SD}	I _F = 70 A, V _{GS} = 0 V		1.1	1.5	V
Reverse Recovery Time	t _{rr}	I _F = 70 A, di/dt = 100 A/μs		30	60	ns

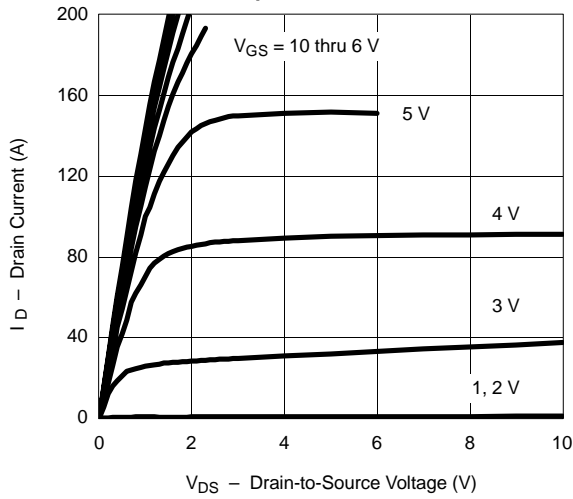
Notes:

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

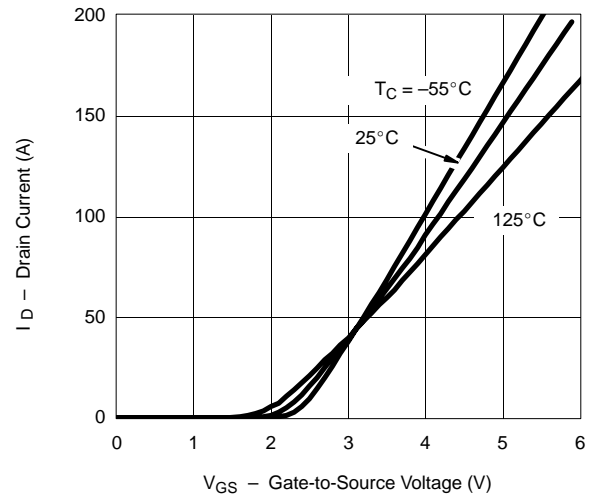


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

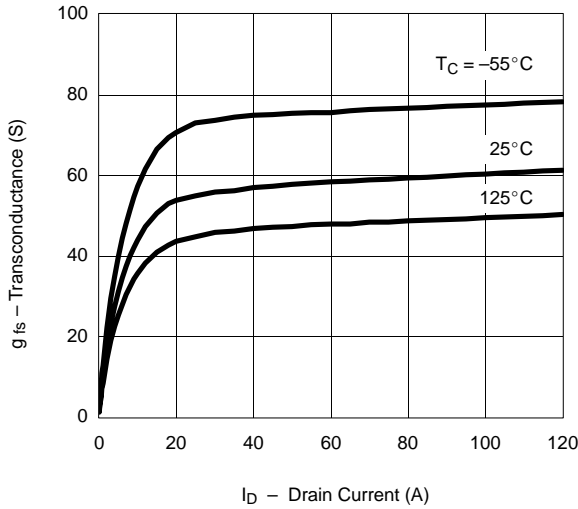
Output Characteristics



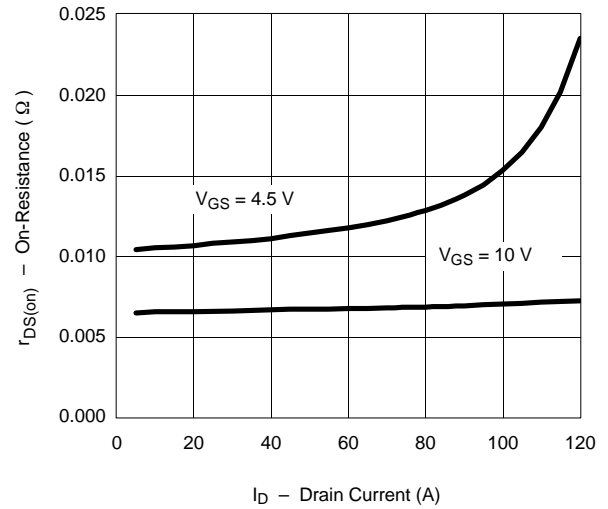
Transfer Characteristics



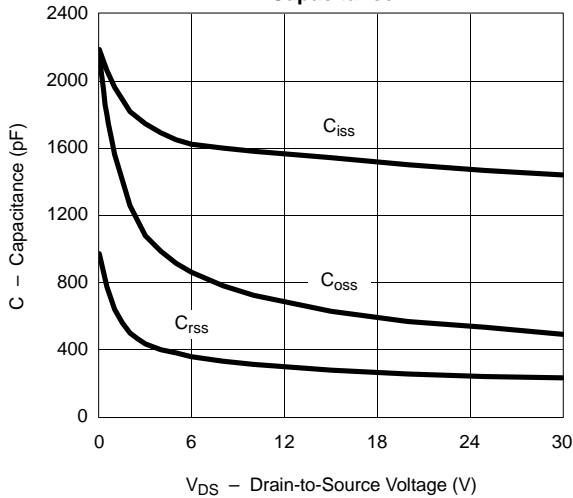
Transconductance



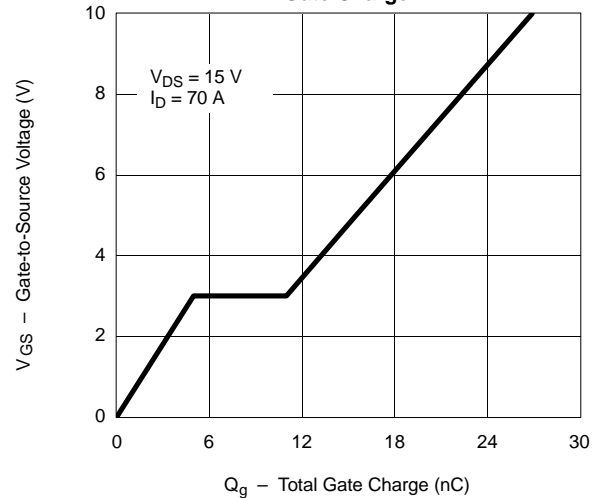
On-Resistance vs. Drain Current



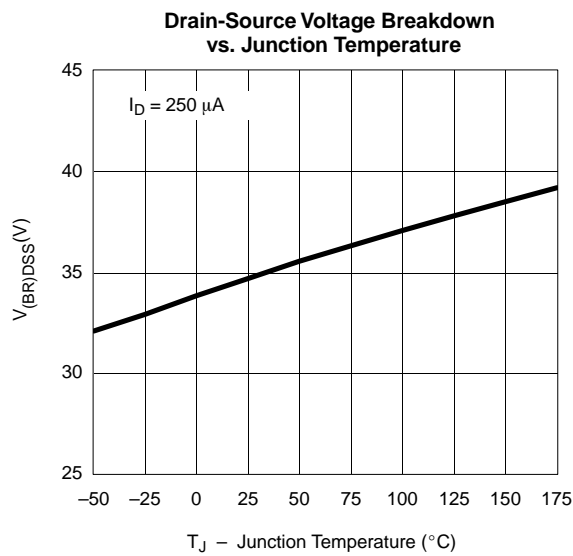
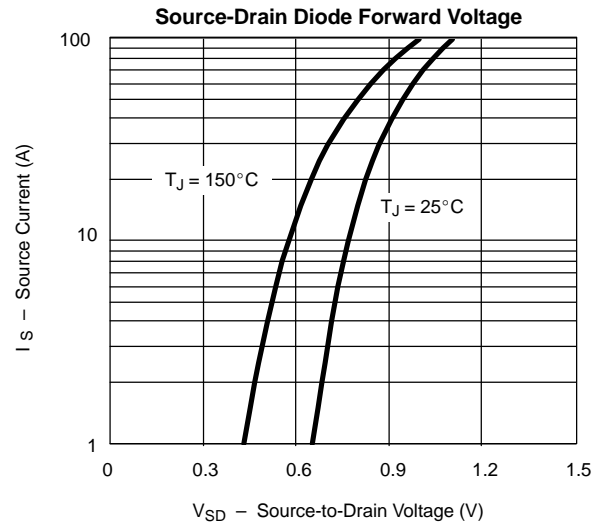
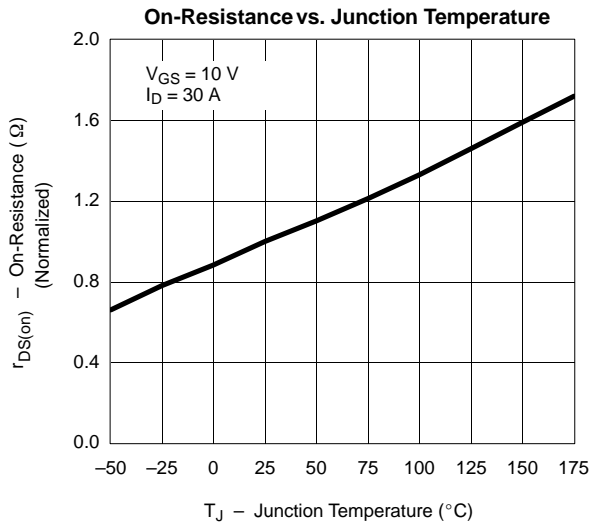
Capacitance



Gate Charge



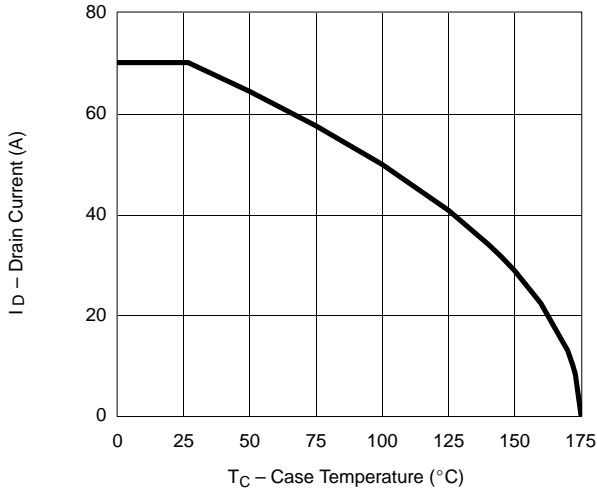
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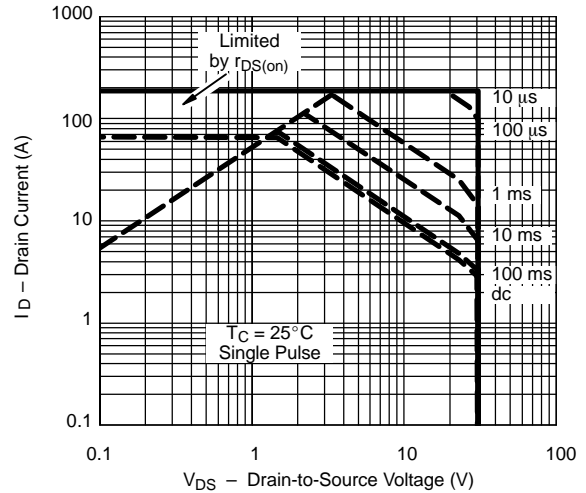


THERMAL RATINGS

Maximum Drain Current vs. Case Temperature



Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Case

