



N-Channel 30-V (D-S), 175°C MOSFET

PRODUCT SUMMARY

$V_{(BR)DSS}$ (V)	$r_{DS(on)}$ (Ω)	I_D (A)
30	0.0095 @ $V_{GS} = 20$ V	70
	0.014 @ $V_{GS} = 4.5$ V	58

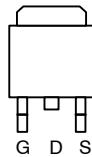
FEATURES

- TrenchFET® Power MOSFET
- Optimized for High- or Low-Side
- New Low Thermal Resistance Package
- 100% R_g Tested

APPLICATIONS

- DC/DC Converters
- Synchronous Rectifiers

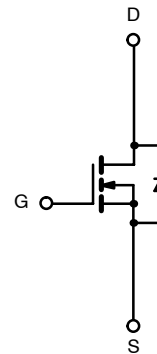
TO-263



Top View

DRAIN connected to TAB

Ordering Information: SUM70N03-09CP
SUM70N03-09CP-E3 (Lead Free)



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	70	A
	$T_C = 125^\circ\text{C}$		40	
Pulsed Drain Current		I_{DM}	100	
Avalanche Current		I_{AR}	35	mJ
Repetitive Avalanche Energy ^a		E_{AR}	61 ^b	
Maximum Power Dissipation ^a	$T_C = 25^\circ\text{C}$	P_D	93	W
	$T_A = 25^\circ\text{C}^c$		3.75	
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 ^c	R_{thJA}	40	$^\circ\text{C/W}$
Junction-to-Case		R_{thJC}	1.6	

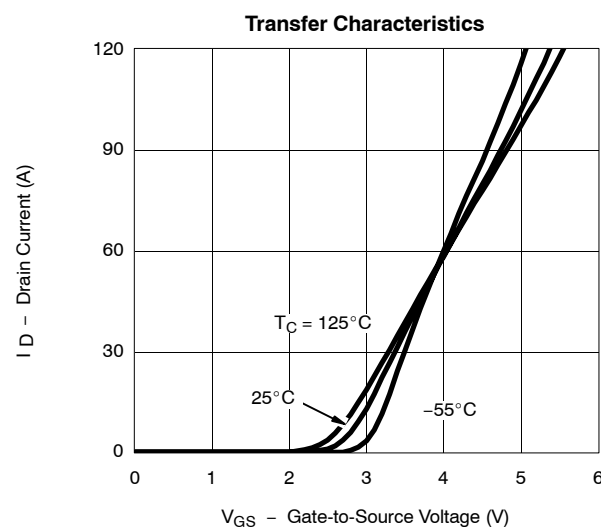
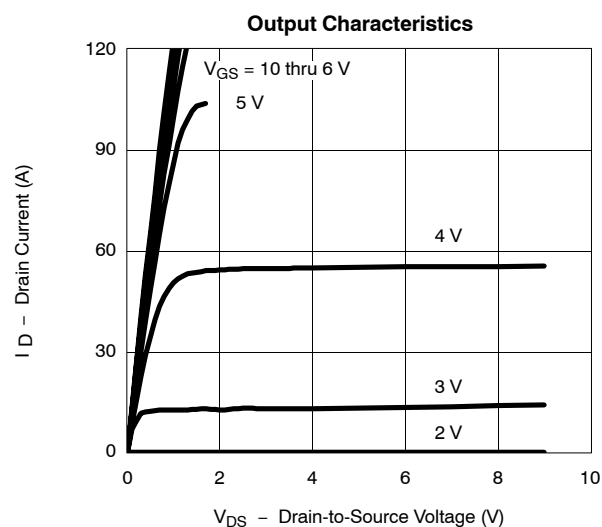
Notes

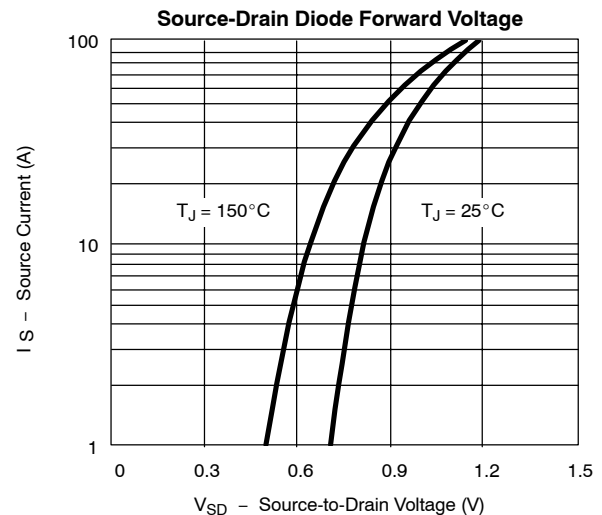
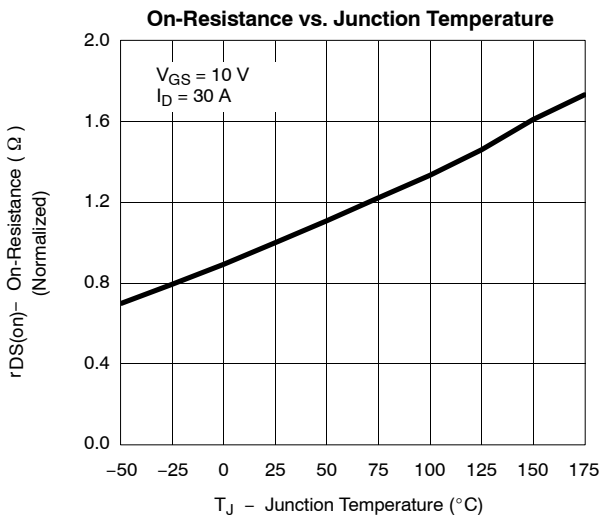
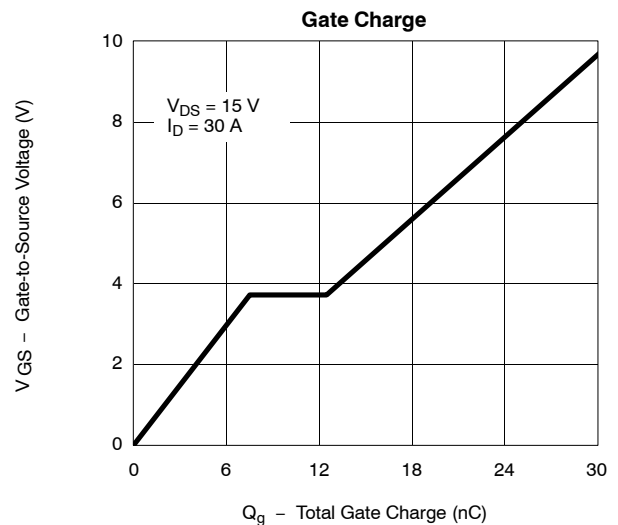
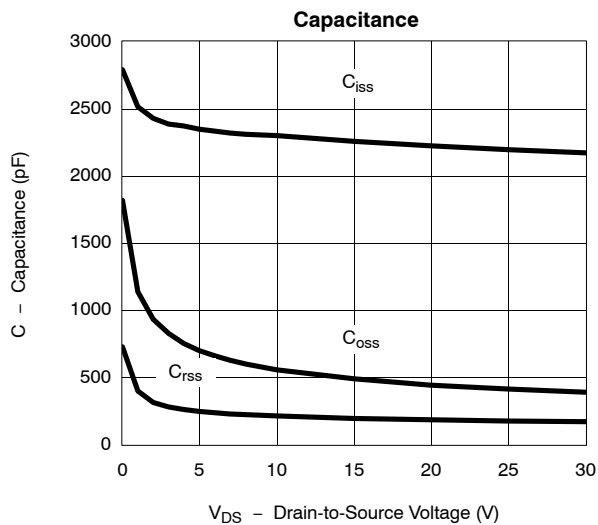
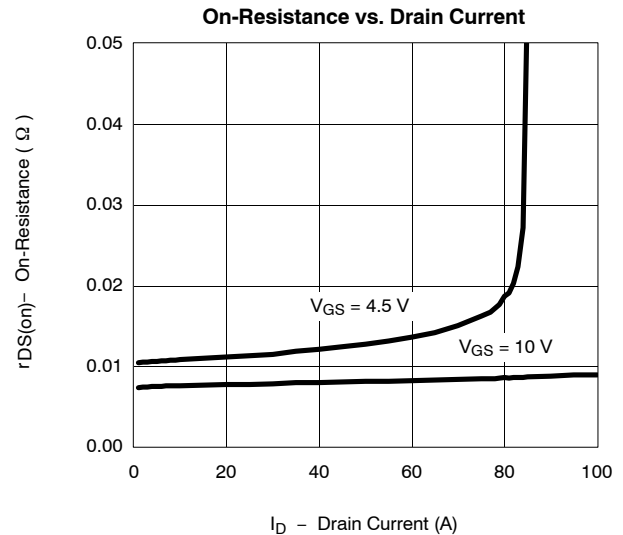
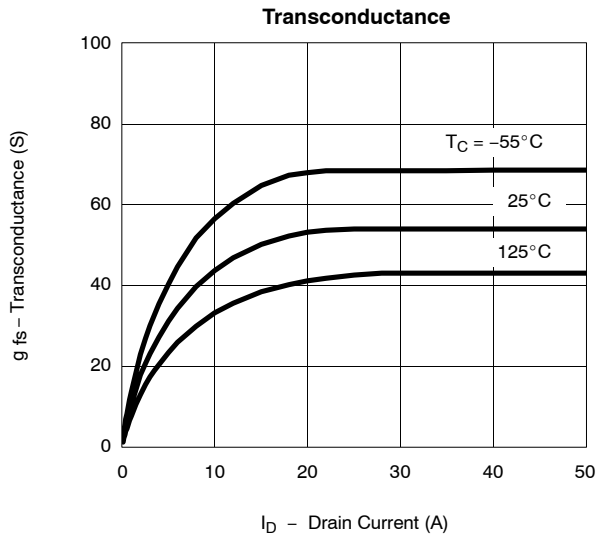
- Duty cycle $\leq 1\%$.
- See SOA curve for voltage derating.
- When mounted on 1" square PCB (FR-4 material).

SPECIFICATIONS (T _J = 25 °C UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Condition	Min	Typ ^a	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 _D = 250 μA	1.0		3.0	
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ±20 V			± 100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 30 V, V _{GS} = 0 V			1	μA
		V _{DS} = 30 V, V _{GS} = 0 V, T _J = 125 °C			250	
On-State Drain Current ^b	I _{D(on)}	V _{DS} = 5 V, V _{GS} = 10 V	100			A
Drain-Source On-State Resistance ^b	r _{DS(on)}	V _{GS} = 10 V, I _D = 20 A		0.0076	0.0095	Ω
		V _{GS} = 10 V, I _D = 20 A, T _J = 175 °C			0.015	
		V _{GS} = 4.5 V, I _D = 20 A		0.0115	0.014	
Forward Transconductance ^b	g _{fs}	V _{DS} = 15 V, I _D = 20 A	20			S
Dynamic ^a						
Input Capacitance	C _{iss}	V _{GS} = 0 V, V _{DS} = 25 V, f = 1 MHz		2200		pF
Output Capacitance	C _{oss}			410		
Reverse Transfer Capacitance	C _{rss}			180		
Gate Resistance	R _g		0.5	1.5	2.1	Ω
Total Gate Charge ^c	Q _g	V _{DS} = 15 V, V _{GS} = 10 V, I _D = 50 A		31	45	nC
Gate-Source Charge ^c	Q _{gs}			7.5		
Gate-Drain Charge ^c	Q _{gd}			5.0		
Turn-On Delay Time ^c	t _{d(on)}	V _{DD} = 15 V, R _L = 0.3 Ω I _D ≅ 50 A, V _{GEN} = 10 V, R _g = 2.5 Ω		9	15	ns
Rise Time ^c	t _r			80	120	
Turn-Off Delay Time ^c	t _{d(off)}			22	35	
Fall Time ^c	t _f			8	12	
Source-Drain Diode Ratings and Characteristic (T _C = 25 °C)						
Pulsed Current	I _{SM}				100	A
Diode Forward Voltage ^b	V _{SD}	I _F = 50 A, V _{GS} = 0 V		1.2	1.5	V
Source-Drain Reverse Recovery Time	t _{rr}	I _F = 50 A, di/dt = 100 A/μs		35	70	ns

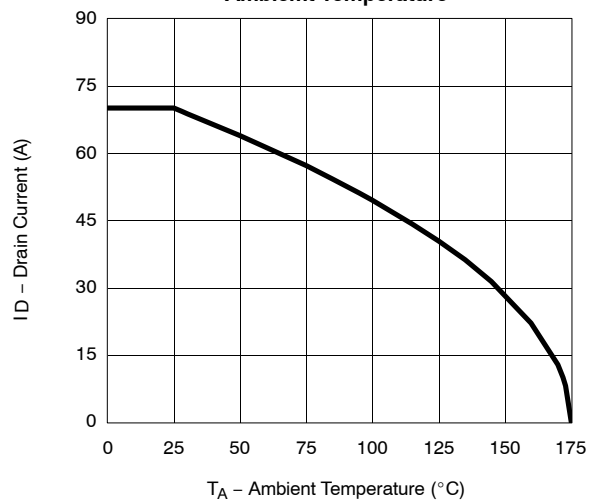
Notes

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

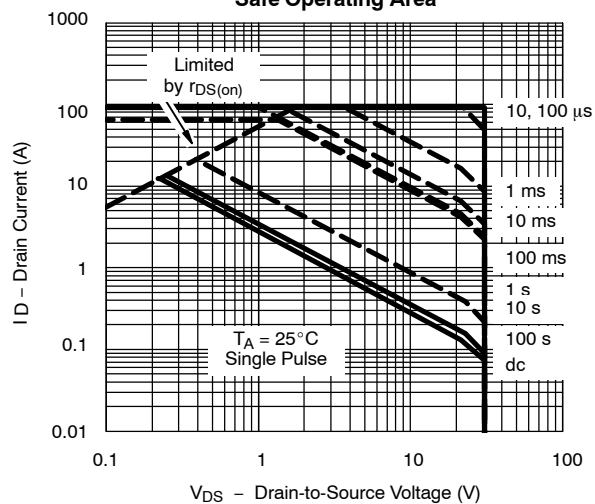
TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

**TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)**

THERMAL RATINGS

Maximum Drain Current vs.
Ambient Temperature

Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Case

