

N-Channel 30-V (D-S), 175°C MOSFET

PRODUCT SUMMARY

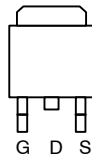
$V_{(BR)DSS}$ (V)	$r_{DS(on)}$ (Ω)	I_D (A)
30	0.0095 @ $V_{GS} = 20$ V	70
	0.014 @ $V_{GS} = 4.5$ V	58

FEATURES

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

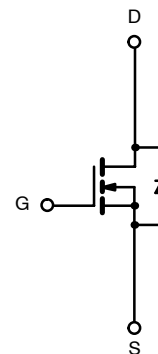
APPLICATIONS

- DC/DC Converters
- Synchronous Rectifiers

TO-263


Top View

DRAIN connected to TAB



N-Channel MOSFET

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

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
		$T_C = 125^\circ\text{C}$	40
Pulsed Drain Current	I_{DM}	100	A
Avalanche Current	I_{AR}	35	
Repetitive Avalanche Energy ^a	E_{AR}	61 ^b	mJ
Maximum Power Dissipation ^a	P_D	$T_C = 25^\circ\text{C}$	93
		$T_A = 25^\circ\text{C}$	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	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).

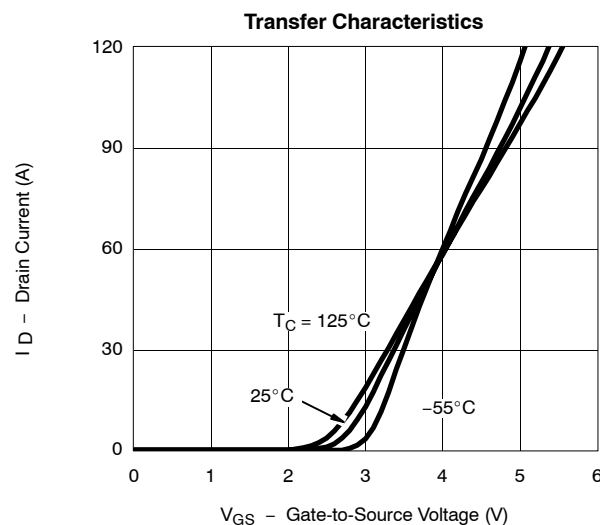
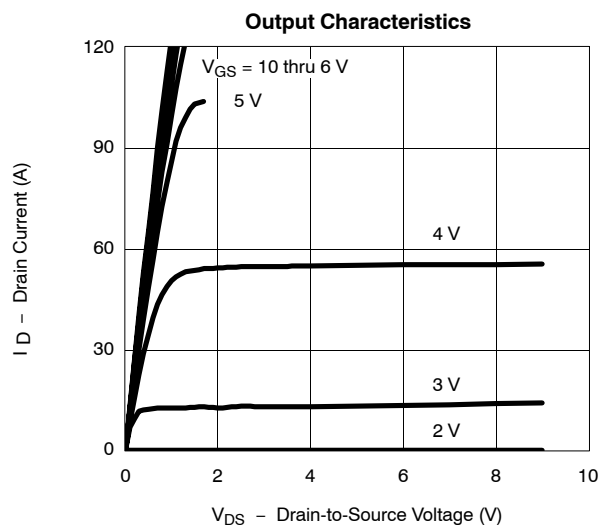
SPECIFICATIONS ($T_J = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)

Parameter	Symbol	Test Condition	Min	Typ ^a	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0\text{ V}, I_D = 250\ \mu\text{A}$	30			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\ \mu\text{A}$	1.0		3.0	
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 30\text{ V}, V_{GS} = 0\text{ V}$			1	μA
		$V_{DS} = 30\text{ V}, V_{GS} = 0\text{ V}, T_J = 125^\circ\text{C}$			250	
On-State Drain Current ^b	$I_{D(on)}$	$V_{DS} = 5\text{ V}, V_{GS} = 10\text{ V}$	100			A
Drain-Source On-State Resistance ^b	$r_{DS(on)}$	$V_{GS} = 10\text{ V}, I_D = 20\text{ A}$		0.0076	0.0095	Ω
		$V_{GS} = 10\text{ V}, I_D = 20\text{ A}, T_J = 175^\circ\text{C}$			0.015	
		$V_{GS} = 4.5\text{ V}, I_D = 20\text{ A}$		0.0115	0.014	
Forward Transconductance ^b	g_{fs}	$V_{DS} = 15\text{ V}, I_D = 20\text{ A}$	20			S
Dynamic^a						
Input Capacitance	C_{iss}	$V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$		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	$V_{DS} = 15\text{ V}, V_{GS} = 10\text{ V}, I_D = 50\text{ A}$		31	45	nC
Gate-Source Charge ^c	Q_{gs}			7.5		
Gate-Drain Charge ^c	Q_{gd}			5.0		
Turn-On Delay Time ^c	$t_{d(on)}$	$V_{DD} = 15\text{ V}, R_L = 0.3\ \Omega$ $I_D \cong 50\text{ A}, V_{GEN} = 10\text{ V}, R_g = 2.5\ \Omega$		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 ($T_C = 25^\circ\text{C}$)						
Pulsed Current	I_{SM}				100	A
Diode Forward Voltage ^b	V_{SD}	$I_F = 50\text{ A}, V_{GS} = 0\text{ V}$		1.2	1.5	V
Source-Drain Reverse Recovery Time	t_{rr}	$I_F = 50\text{ A}, di/dt = 100\text{ A}/\mu\text{s}$		35	70	ns

Notes

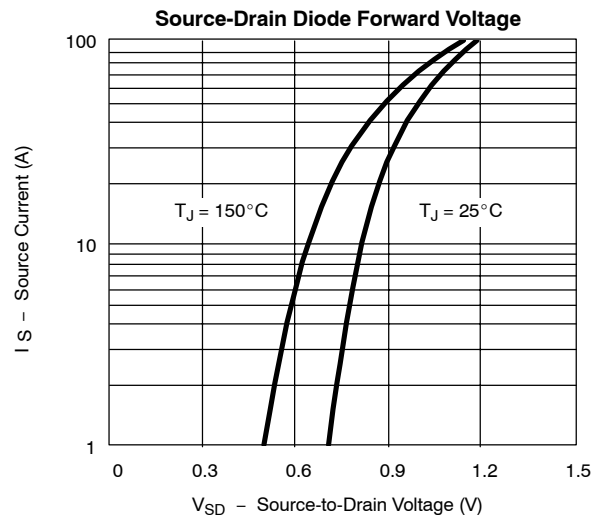
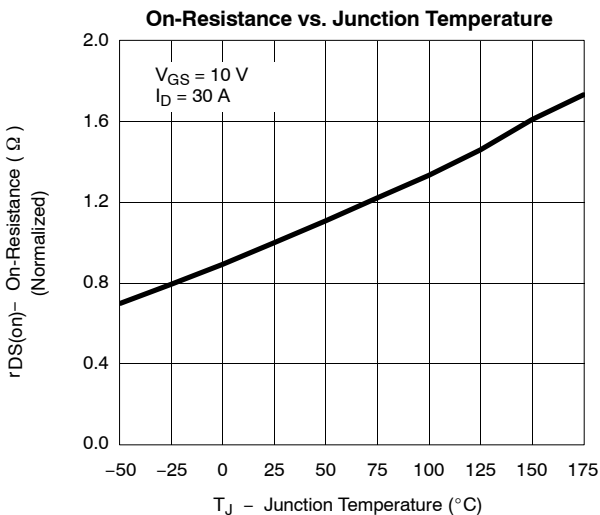
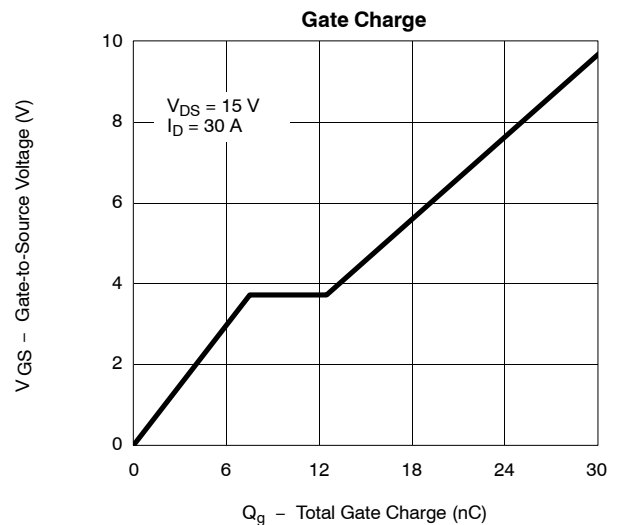
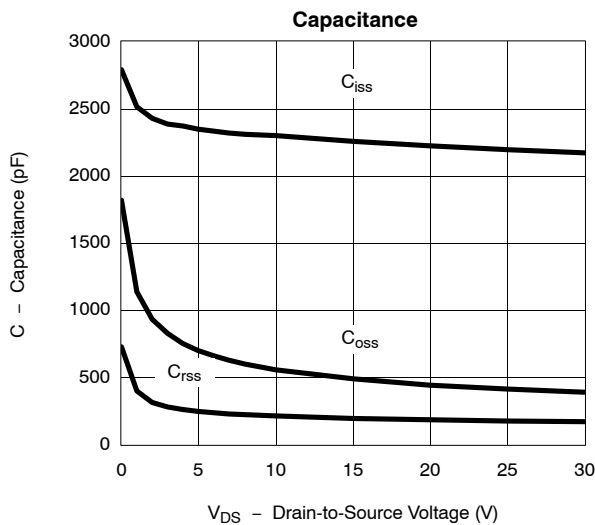
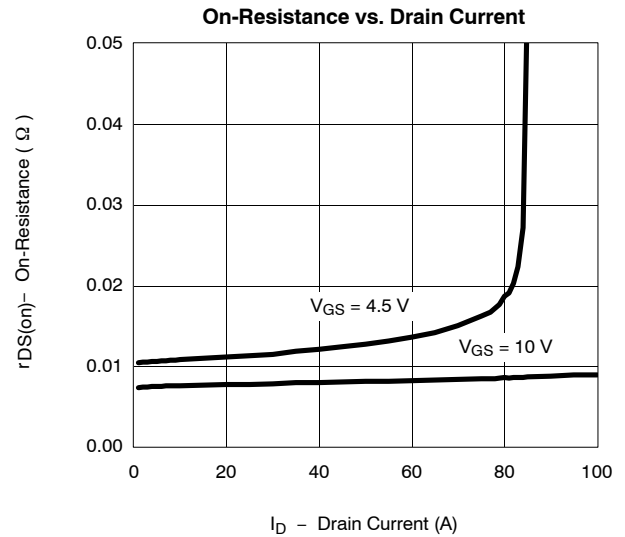
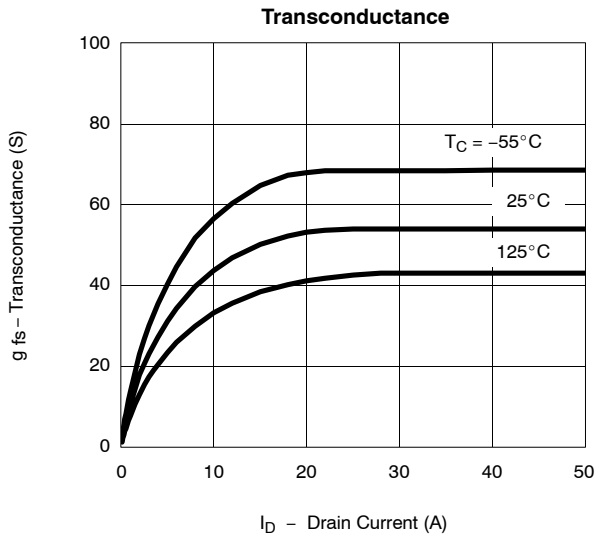
- Guaranteed by design, not subject to production testing.
- Pulse test; pulse width $\leq 300\ \mu\text{s}$, duty cycle $\leq 2\%$.
- Independent of operating temperature.

TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)



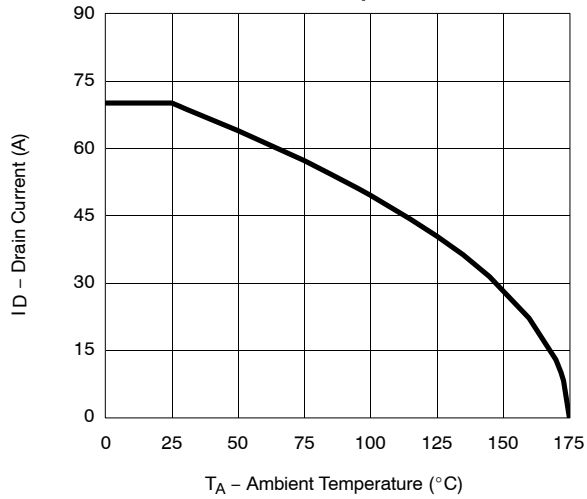


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

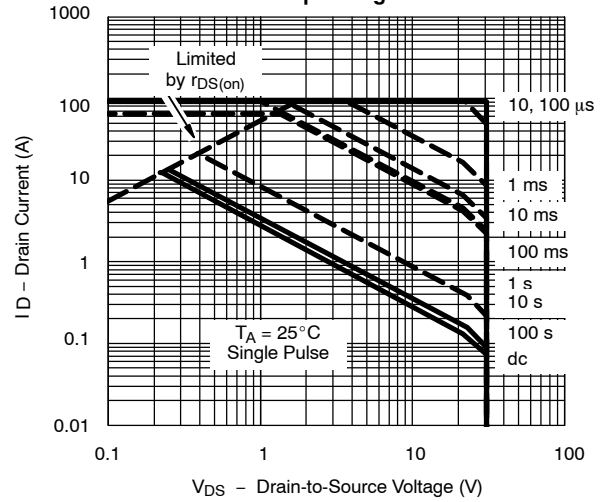


THERMAL RATINGS

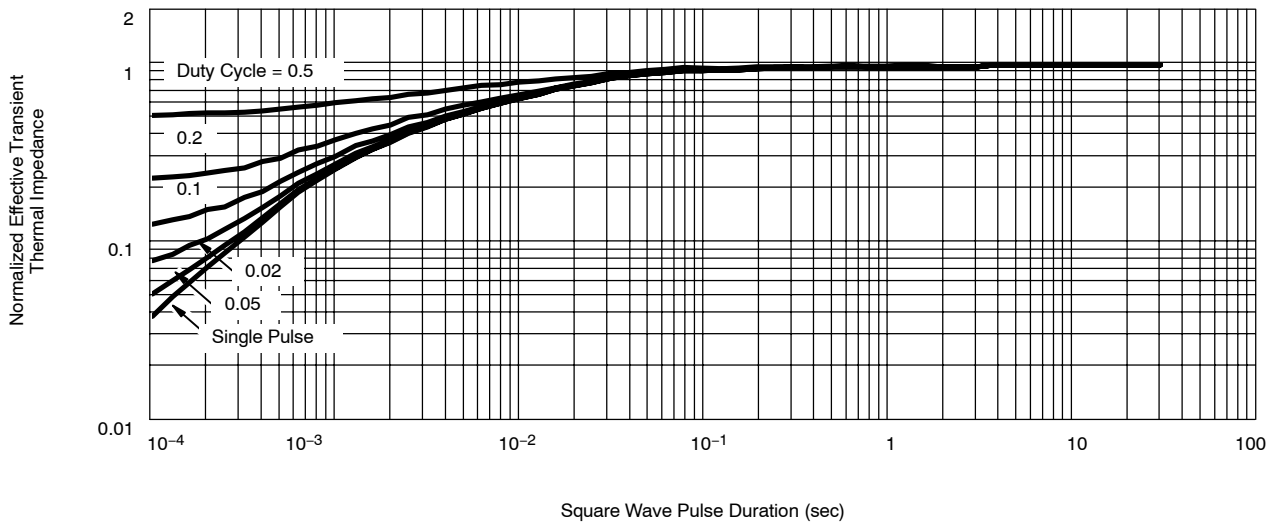
Maximum Drain Current vs. Ambient Temperature



Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Case





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