



## N-Channel 30-V (D-S), 175°C MOSFET

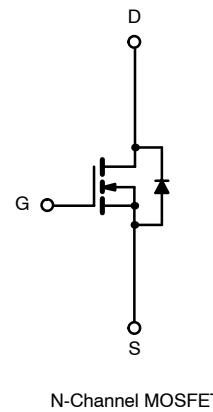
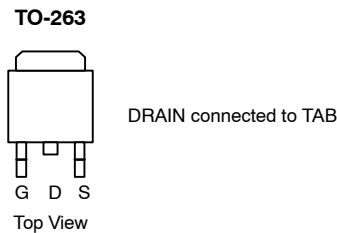
PRODUCT SUMMARY		
$V_{(BR)DSS}$ (V)	$r_{DS(on)}$ ( $\Omega$ )	$I_D$ (A)
30	0.0095 @ $V_{GS} = 20$ V	70
	0.014 @ $V_{GS} = 4.5$ V	58

### 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



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	$V_{GS}$	$\pm 20$	
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 <sup>a</sup>	$E_{AR}$	61 <sup>b</sup>	mJ
Maximum Power Dissipation <sup>a</sup>	$P_D$	$T_C = 25^\circ\text{C}$	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	$^\circ\text{C}/\text{W}$
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).

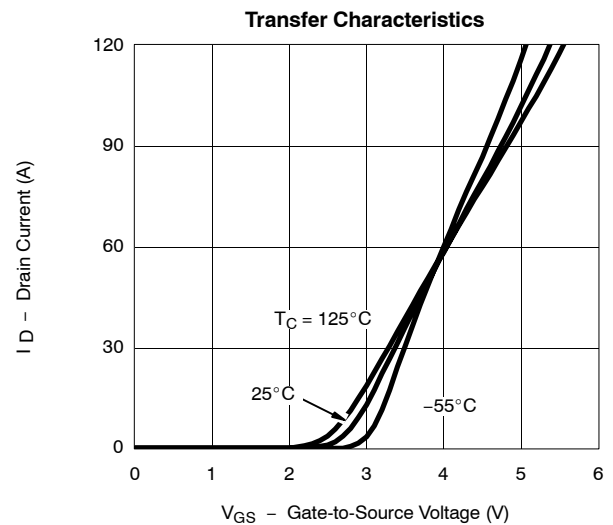
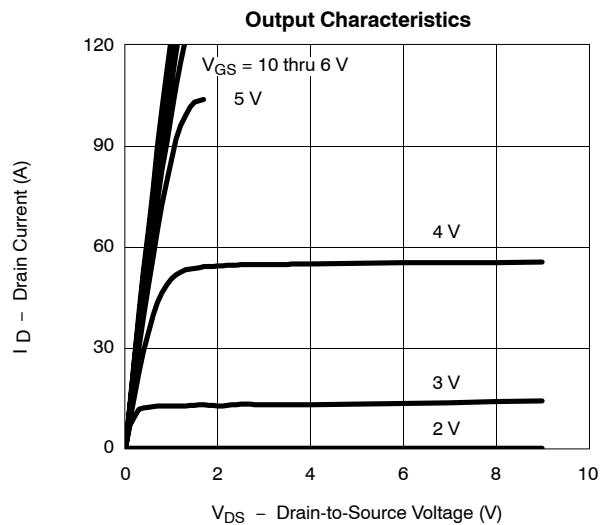


SPECIFICATIONS (T <sub>J</sub> = 25°C UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Condition	Min	Typ <sup>a</sup>	Max	Unit
<b>Static</b>						
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0 V, I <sub>D</sub> = 250 μA	30			V
Gate Threshold Voltage	V <sub>GS(th)</sub>	V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

### Notes

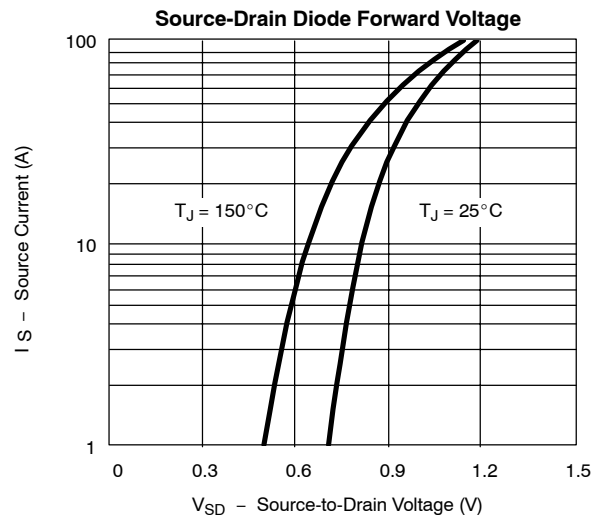
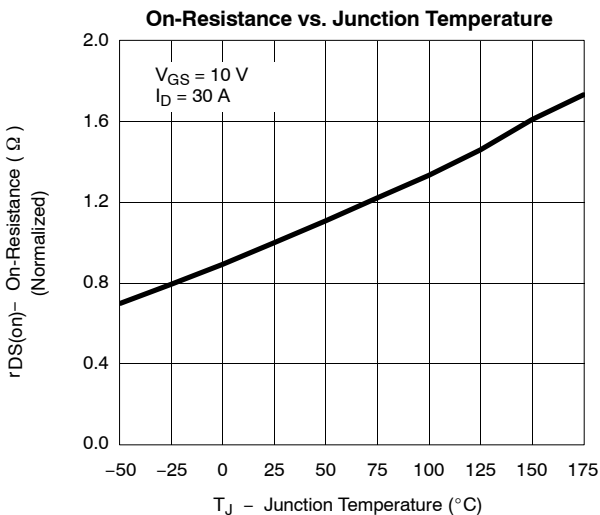
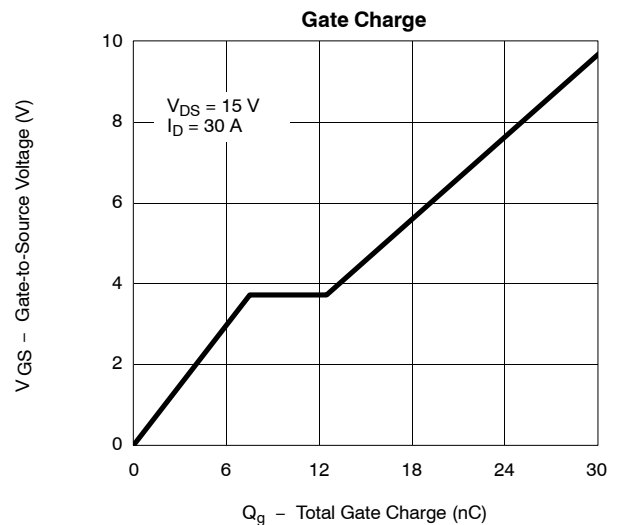
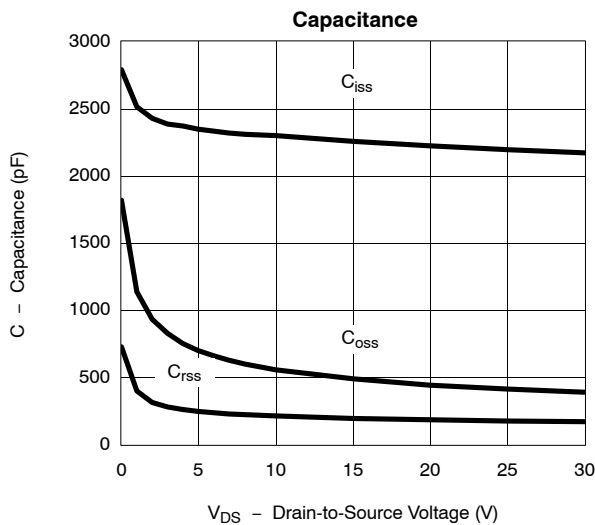
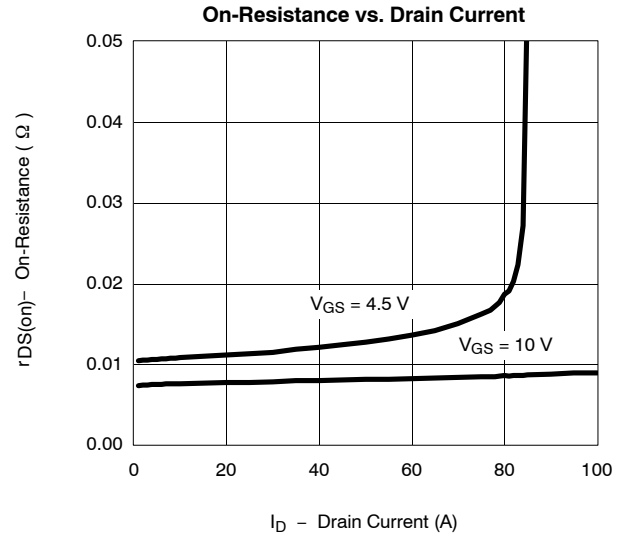
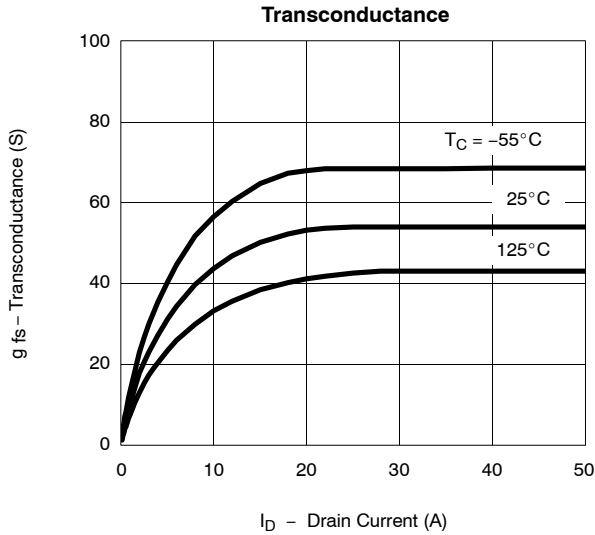
- Guaranteed by design, not subject to production testing.
- Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.
- Independent of operating temperature.

## TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)



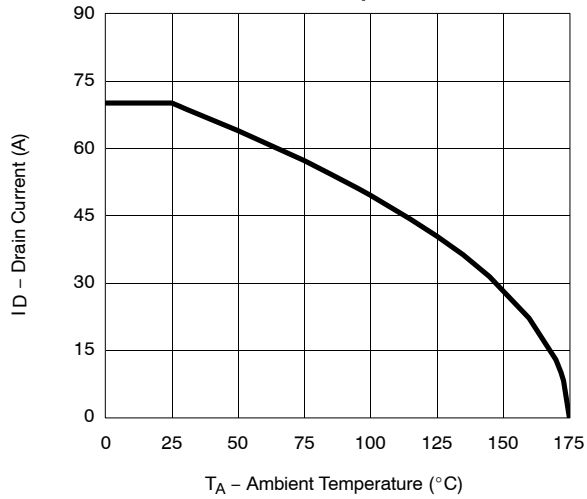


**TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)**

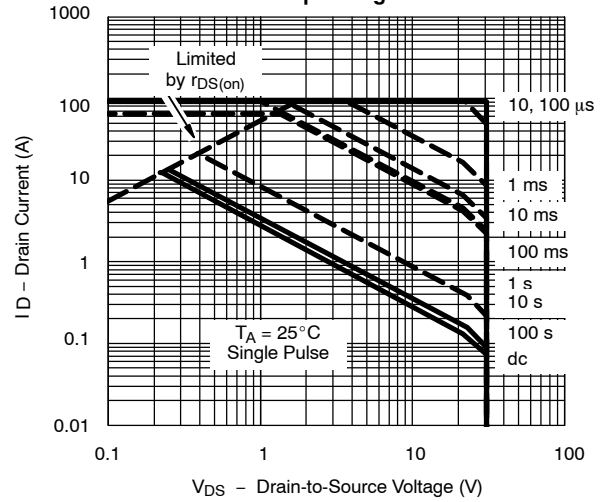


**THERMAL RATINGS**

Maximum Drain Current vs. Ambient Temperature



Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Case

