



N-Channel Reduced Q_g , Fast Switching MOSFET

PRODUCT SUMMARY		
$V_{(BR)DSS}$ (V)	$r_{DS(on)}$ (Ω)	I_D (A)
30	0.0075 @ $V_{GS} = 10$ V	85
	0.0105 @ $V_{GS} = 4.5$ V	72

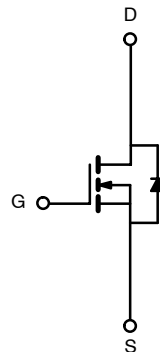
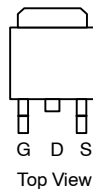
FEATURES

- TrenchFET® Power MOSFET
- 175°C Junction Temperature
- PWM Optimized for High Efficiency
- New Package with Low Thermal Resistance
- 100% R_g Tested

APPLICATIONS

- Buck Converter
 - High Side
 - Low Side
- Synchronous Rectifier
 - Secondary Rectifier

TO-263



N-Channel MOSFET

Ordering Information: SUM85N03-08P
SUM85N03-08P-E3 (Lead Free)

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ 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	$T_C = 25^\circ\text{C}$	85	A
		$T_C = 100^\circ\text{C}$	60	
Pulsed Drain Current	I_{DM}	200		
Avalanche Current	I_{AR}	50		
Repetitive Avalanche Energy ^a	E_{AR}	L = 0.1 mH	125	mJ
Maximum Power Dissipation ^a	P_D	$T_C = 25^\circ\text{C}$	100 ^b	W
		$T_A = 25^\circ\text{C}$	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}	PCB Mount ^c	40	$^\circ\text{C/W}$
		Free Air	62.5	
Junction-to-Case	R_{thJC}	1.5		

Notes

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



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 _{DS} = 0 V, I _D = 250 μA	30			V
Gate-Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 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} = 30 V, V _{GS} = 0 V			1	μA
		V _{DS} = 30 V, V _{GS} = 0 V, T _J = 125 °C			50	
		V _{DS} = 30 V, V _{GS} = 0 V, T _J = 175 °C			250	
On-State Drain Current ^a	I _{D(on)}	V _{DS} ≥ 5 V, V _{GS} = 10 V	120			A
Drain-Source On-State Resistance ^a	r _{DS(on)}	V _{GS} = 10 V, I _D = 30 A		0.006	0.0075	Ω
		V _{GS} = 10 V, I _D = 30 A, T _J = 125 °C			0.011	
		V _{GS} = 10 V, I _D = 30 A, T _J = 175 °C			0.014	
		V _{GS} = 4.5 V, I _D = 20 A		0.0085	0.0105	
Forward Transconductance ^a	g _{fs}	V _{DS} = 15 V, I _D = 30 A	20			S
Dynamic^b						
Input Capacitance	C _{iss}	V _{GS} = 0 V, V _{DS} = 25 V, f = 1 MHz		1725		pF
Output Capacitance	C _{oss}			425		
Reverse Transfer Capacitance	C _{rss}			120		
Gate-Resistance	R _g		0.5	1.9	3.3	Ω
Total Gate Charge ^b	Q _g	V _{DS} = 15 V, V _{GS} = 4.5 V, I _D = 30 A		13	18	nC
Gate-Source Charge ^b	Q _{gs}			4.5		
Gate-Drain Charge ^b	Q _{gd}			4.0		
Turn-On Delay Time ^b	t _{d(on)}	V _{DD} = 15 V, R _L = 0.5 Ω I _D ≅ 30 A, V _{GEN} = 10 V, R _g = 2.5 Ω		10	15	ns
Rise Time ^b	t _r			160	240	
Turn-Off Delay Time ^b	t _{d(off)}			30	45	
Fall Time ^b	t _f			55	85	
Source-Drain Diode Ratings and Characteristics (T_C = 25 °C)^c						
Continuous Current	I _S				70	A
Pulsed Current	I _{SM}				200	
Forward Voltage ^a	V _{SD}	I _F = 30 A, V _{GS} = 0 V		1.2	1.5	V
Reverse Recovery Time	t _{rr}	I _F = 85 A, di/dt = 100 A/μs		80	110	ns

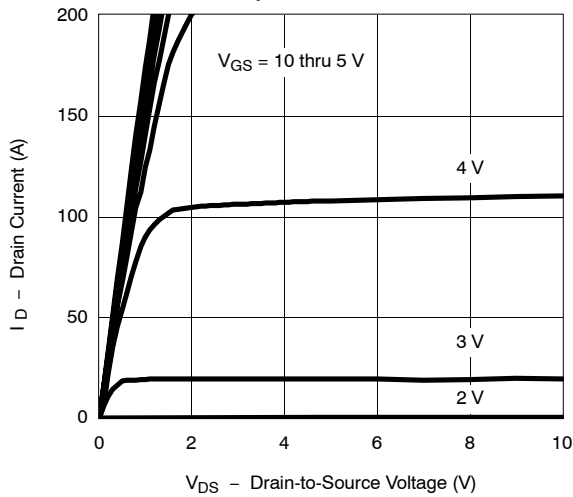
Notes

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

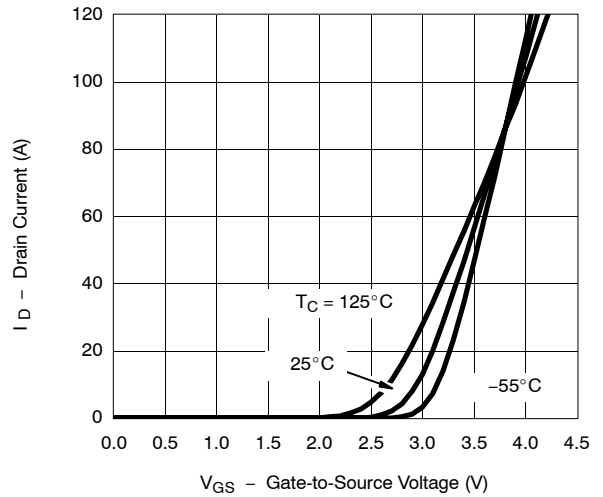


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

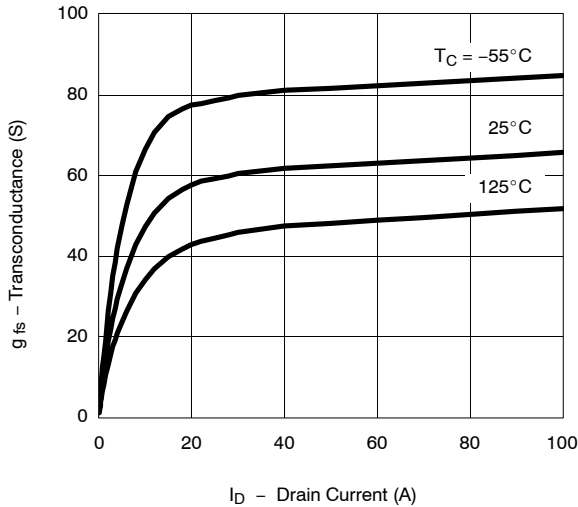
Output Characteristics



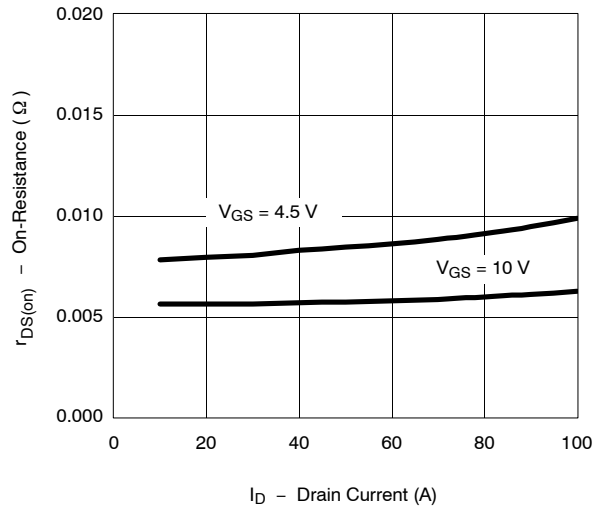
Transfer Characteristics



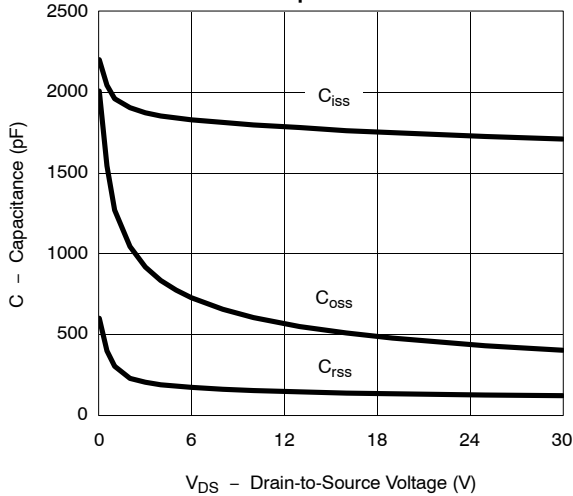
Transconductance



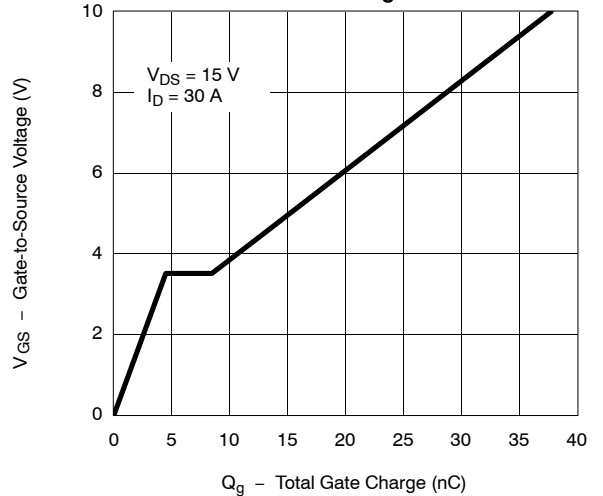
On-Resistance vs. Drain Current



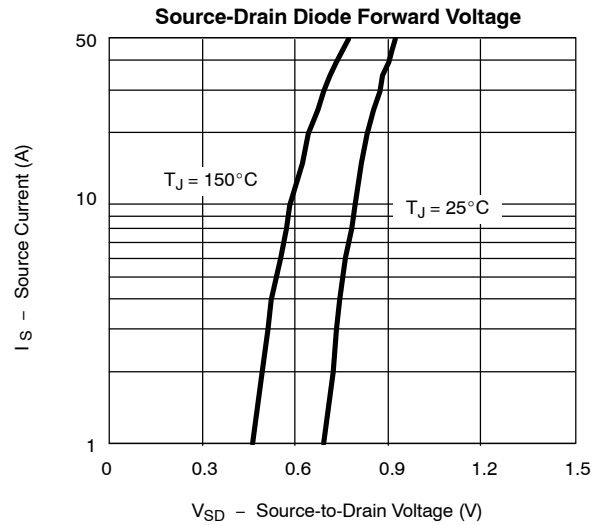
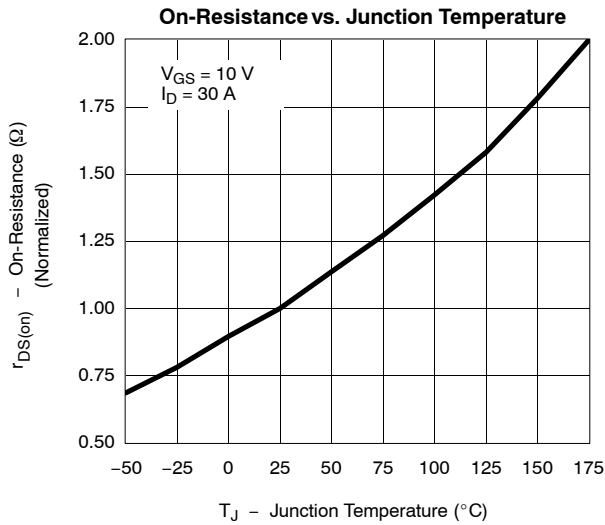
Capacitance



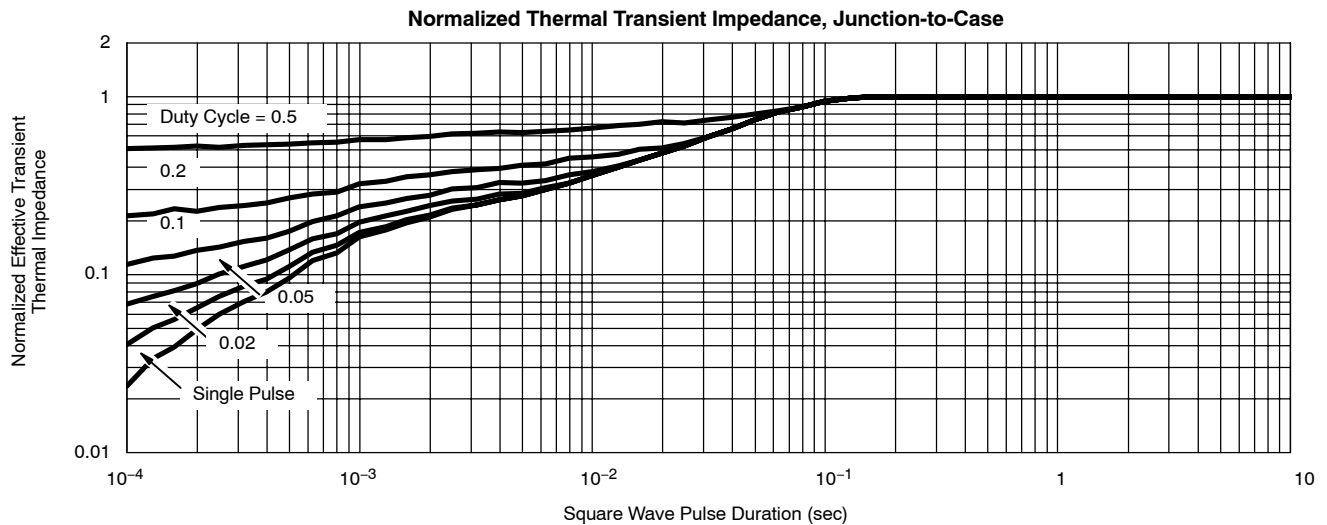
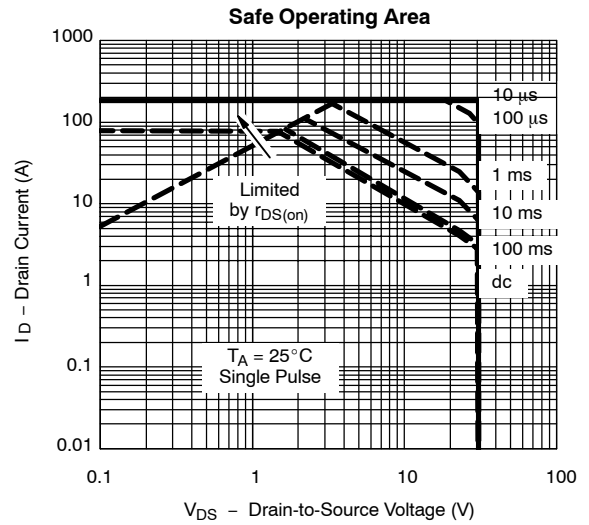
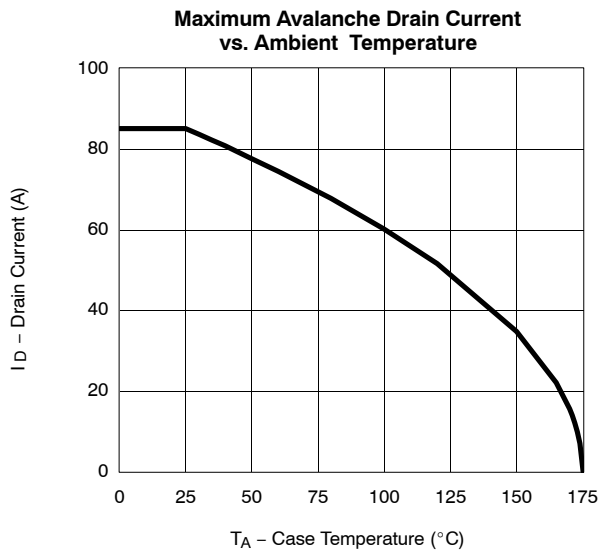
Gate Charge



TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)



THERMAL RATINGS





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