



N-Channel 30-V (D-S) 175°C MOSFET

PRODUCT SUMMARY

$V_{(BR)DSS}$ (V)	$r_{DS(on)}$ (Ω)	I_D (A)
30	0.0042 @ $V_{GS} = 10$ V	110
	0.0065 @ $V_{GS} = 4.5$ V	77

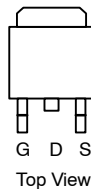
FEATURES

- TrenchFET® Power MOSFET
- 175°C Junction Temperature
- Optimized for Low-Side Synchronous Rectifier Operation
- New Package with Low Thermal Resistance
- 100% R_g Tested

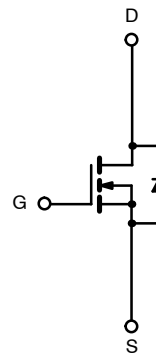
APPLICATIONS

- DC/DC Converters
- Synchronous Rectifier

TO-263



Ordering Information: SUM110N03-04P
SUM110N03-04P-E3 (Lead Free)



N-Channel MOSFET

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 ($T_J = 175^\circ\text{C}$)	$T_C = 25^\circ\text{C}$	I_D	110	A
	$T_C = 100^\circ\text{C}$		88	
Pulsed Drain Current		I_{DM}	300	
Avalanche Current		I_{AR}	55	mJ
Repetitive Avalanche Energy ^a		E_{AR}	151	
Maximum Power Dissipation ^a	$T_C = 25^\circ\text{C}$	P_D	120 ^b	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}	1.25	

Notes

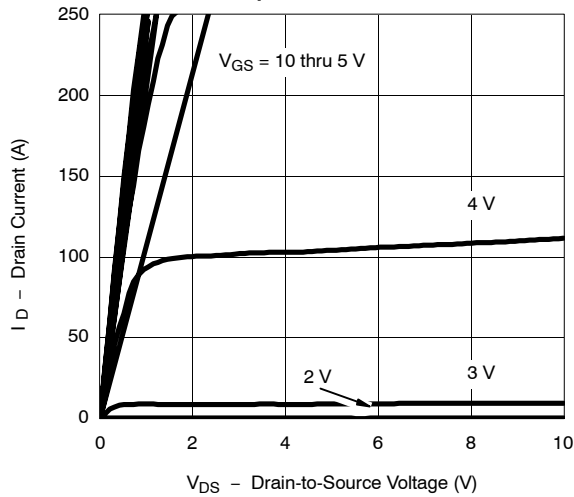
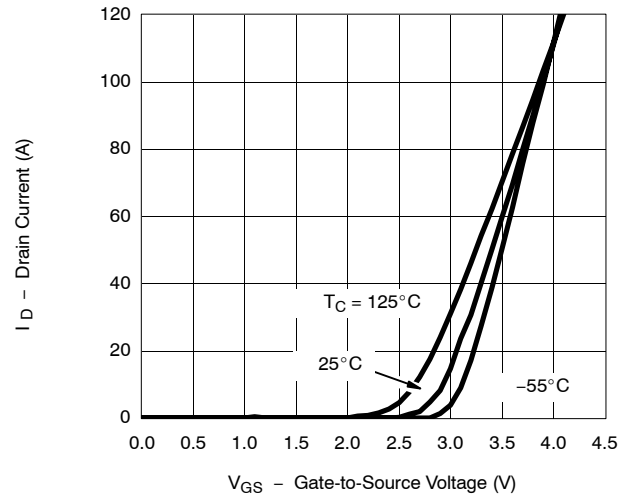
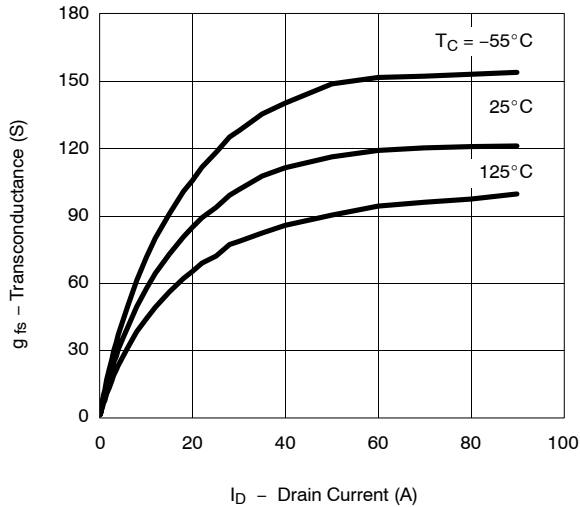
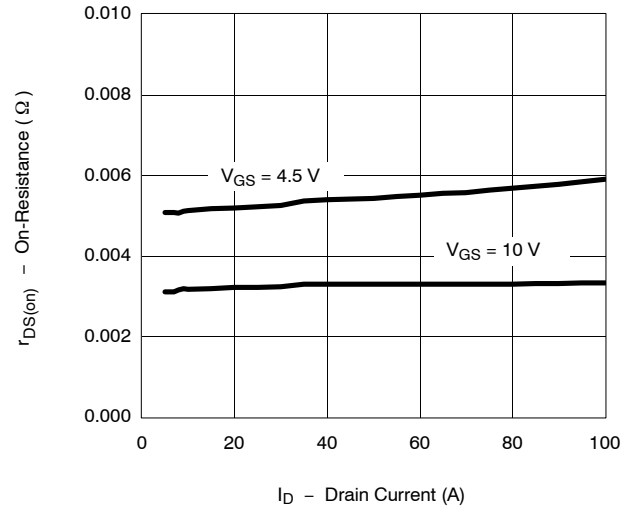
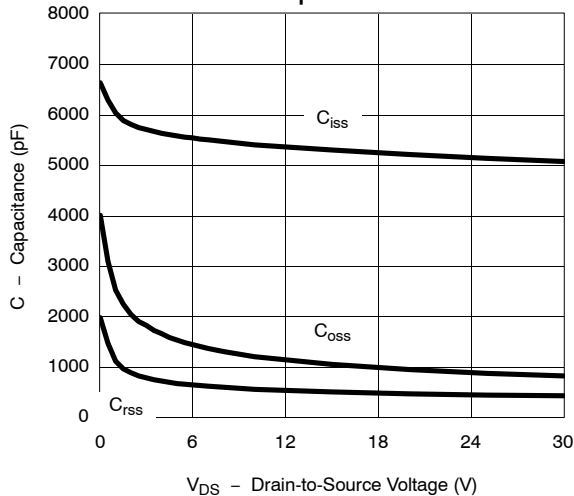
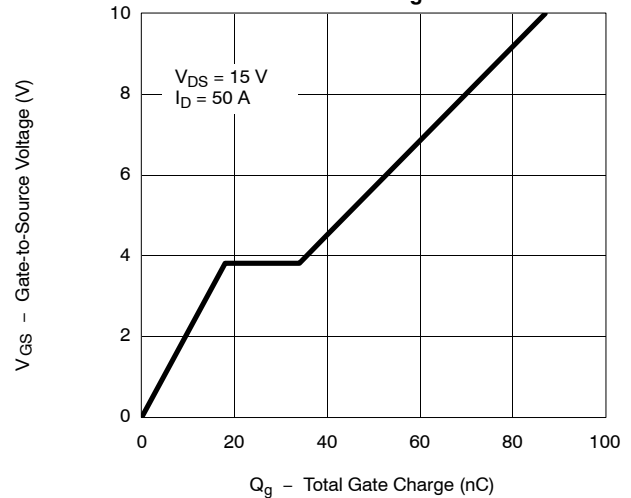
- Duty cycle $\leq 1\%$.
- See SOA curve for voltage derating.
- When mounted on 1" square PCB (FR-4 material).

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

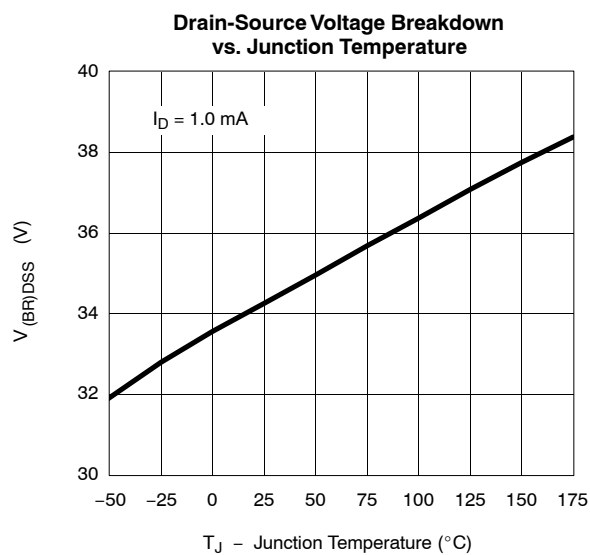
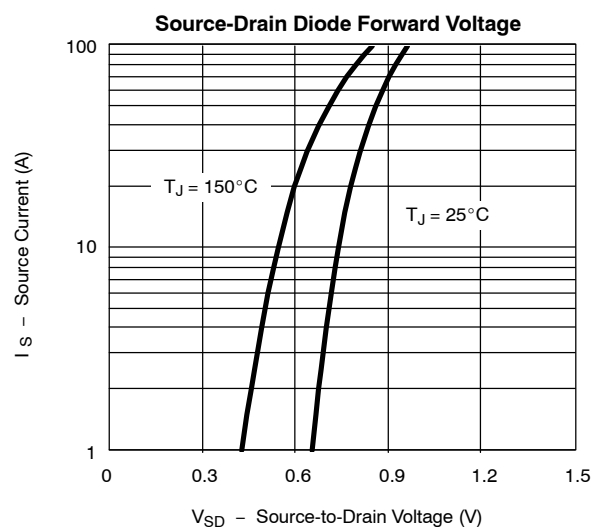
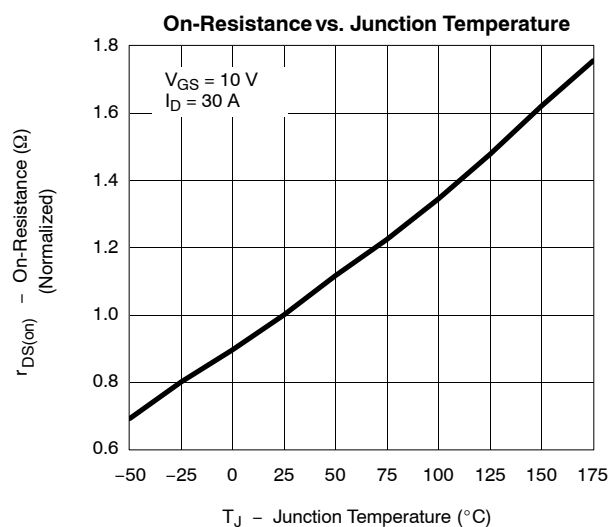
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{DS} = 0 V, I _D = 250 μA	30			V
Gate-Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250 μA	1		3.0	
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ± 20 V			± 100	nA
Zero Gate Voltage 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			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 = 20 A		0.0033	0.0042	Ω
		V _{GS} = 10 V, I _D = 20 A, T _J = 125°C			0.0063	
		V _{GS} = 10 V, I _D = 20 A, T _J = 175°C			0.0076	
		V _{GS} = 4.5 V, I _D = 20 A		0.0052	0.0065	
Forward Transconductance ^a	g _{fs}	V _{DS} = 15 V, I _D = 20 A	20			S
Dynamic ^b						
Input Capacitance	C _{iss}	V _{GS} = 0 V, V _{DS} = 25 V, f = 1 MHz		5100		pF
Output Capacitance	C _{oss}			860		
Reverse Transfer Capacitance	C _{rss}			430		
Gate-Resistance	R _g		0.5	1.0	1.7	Ω
Total Gate Charge ^b	Q _g	V _{DS} = 15 V, V _{GS} = 4.5 V, I _D = 50 A		40	60	nC
Gate-Source Charge ^b	Q _{gs}			18		
Gate-Drain Charge ^b	Q _{gd}			16		
Turn-On Delay Time ^b	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		12	20	ns
Rise Time ^b	t _r			12	20	
Turn-Off Delay Time ^b	t _{d(off)}			40	60	
Fall Time ^b	t _f			10	15	
Source-Drain Diode Ratings and Characteristics (T _C = 25°C) ^c						
Continuous Current	I _S				100	A
Pulsed Current	I _{SM}				300	
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 = 50 A, di/dt = 100 A/μs		40	80	ns

Notes

- a. Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.
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**

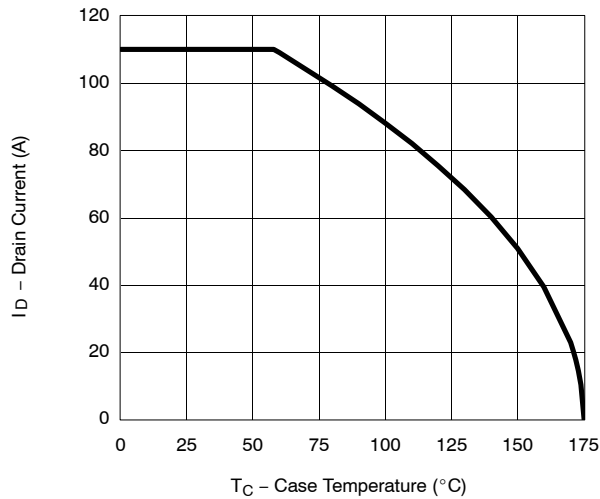
TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)



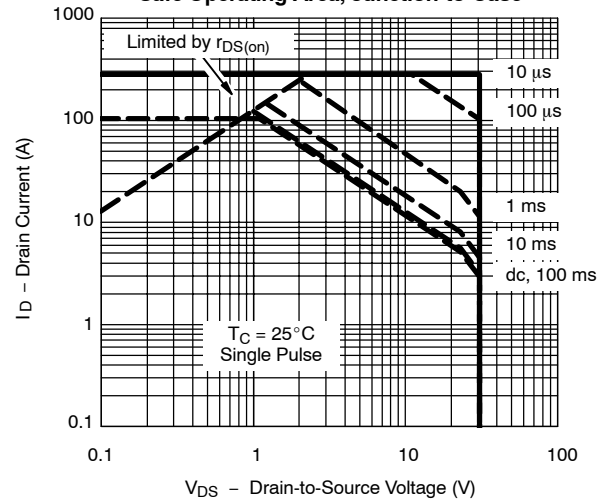


THERMAL RATINGS

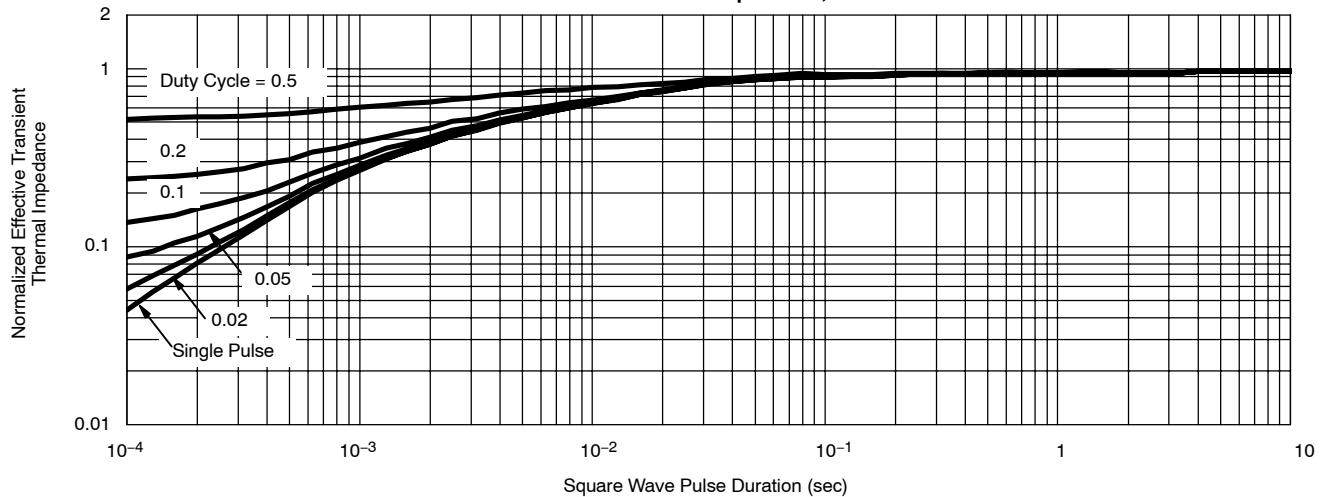
**Maximum Avalanche Drain Current
vs. Case Temperature**



Safe Operating Area, Junction-to-Case



Normalized Thermal Transient Impedance, Junction-to-Case





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