



SUM110N10-09
Vishay Siliconix

N-Channel 100-V (D-S) 200°C MOSFET

PRODUCT SUMMARY		
$V_{(BR)DSS}$ (V)	$r_{DS(on)}$ (Ω)	I_D (A)
100	0.0095 @ $V_{GS} = 10$ V	110 ^a

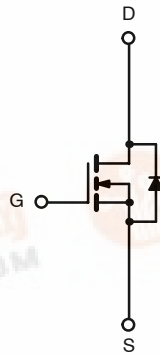
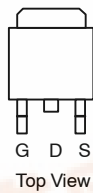
FEATURES

- TrenchFET® Power MOSFET
- 200°C Junction Temperature
- New Package with Low Thermal Resistance
- 100% R_G Tested

APPLICATIONS

- Automotive
 - 42-V Power Bus
 - DC/DC Conversion
 - Motor Drivers

TO-263



Ordering Information: SUM110N10-09
SUM110N10-09-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}	100	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	A
	$T_C = 125^\circ\text{C}$		87 ^a	
Pulsed Drain Current		I_{DM}	440	
Avalanche Current		I_{AR}	75	
Repetitive Avalanche Energy ^b	$L = 0.1$ mH	E_{AR}	280	mJ
Maximum Power Dissipation ^b	$T_C = 25^\circ\text{C}$	P_D	437.5 ^c	W
	$T_A = 25^\circ\text{C}^d$		3.75	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55 to 200	$^\circ\text{C}$

THERMAL RESISTANCE RATINGS				
Parameter		Symbol	Limit	Unit
Junction-to-Ambient	PCB Mount (TO-263) ^d	R_{thJA}	40	$^\circ\text{C/W}$
Junction-to-Case (Drain)		R_{thJC}	0.4	

Notes

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

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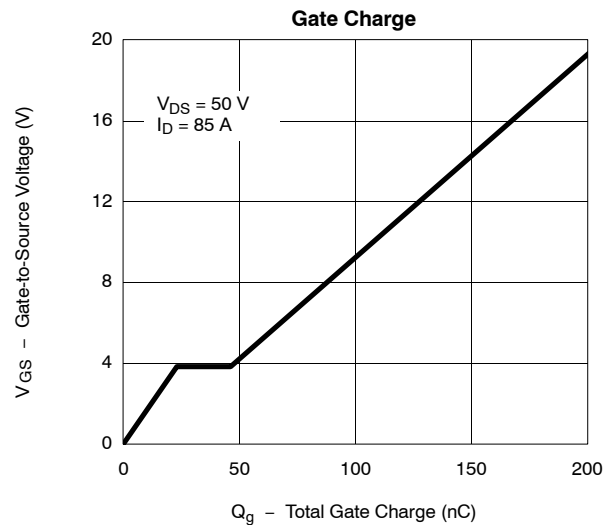
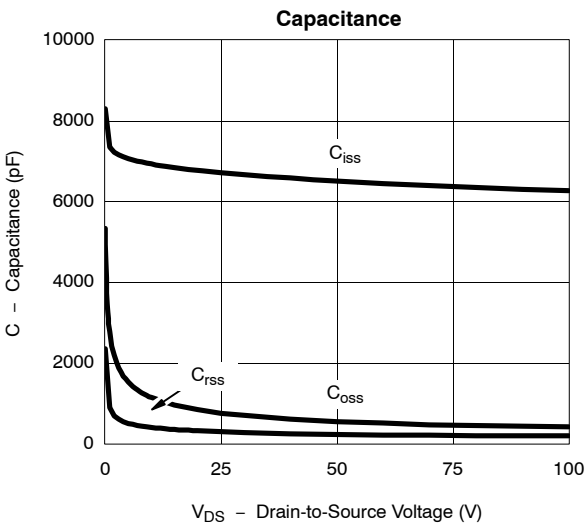
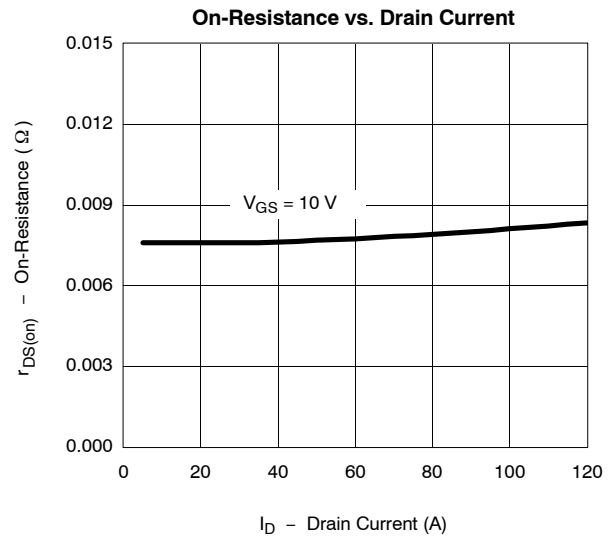
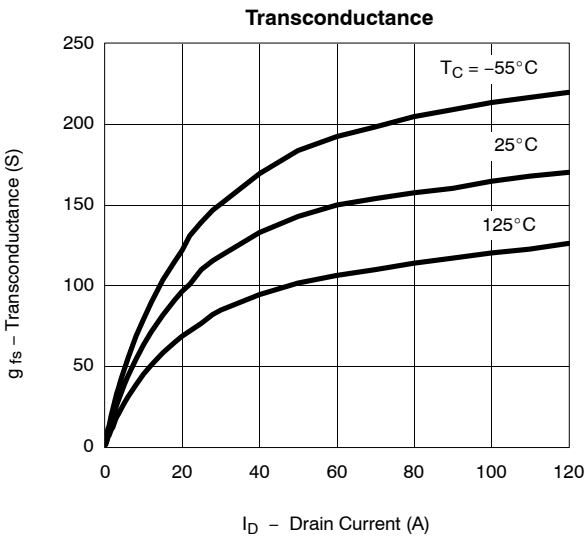
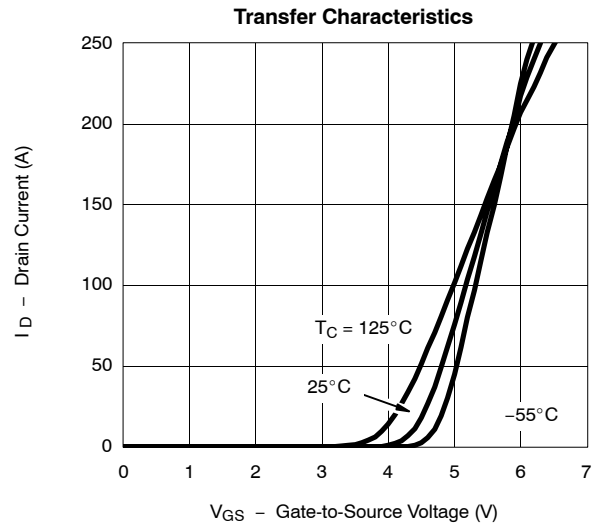
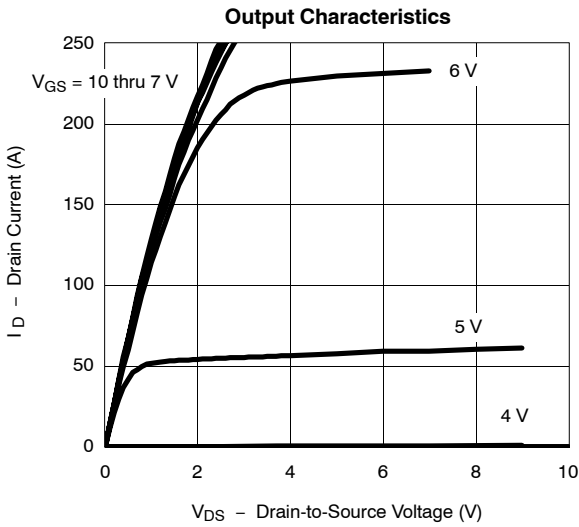
SPECIFICATIONS (T _J = 25 °C UNLESS OTHERWISE NOTED)							
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit	
Static							
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{DS} = 0 V, I _D = 250 μA	100			V	
Gate-Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250 μA	2		4		
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ± 20 V			± 100	nA	
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 100 V, V _{GS} = 0 V			1	μA	
		V _{DS} = 100 V, V _{GS} = 0 V, T _J = 125 °C			50		
		V _{DS} = 100 V, V _{GS} = 0 V, T _J = 200 °C			10		
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		0.0078	0.0095	Ω	
		V _{GS} = 10 V, I _D = 30 A, T _J = 125 °C			0.017		
		V _{GS} = 10 V, I _D = 30 A, T _J = 200 °C			0.025		
Forward Transconductance ^a	g _{fs}	V _{DS} = 15 V, I _D = 30 A	25			S	
Dynamic^b							
Input Capacitance	C _{iss}	V _{GS} = 0 V, V _{DS} = 25 V, f = 1 MHz		6700		pF	
Output Capacitance	C _{oss}			750			
Reverse Transfer Capacitance	C _{rss}			280			
Total Gate Charge ^c	Q _g	V _{DS} = 50 V, V _{GS} = 10 V, I _D = 85 A		110	160	nC	
Gate-Source Charge ^c	Q _{gs}			24			
Gate-Drain Charge ^c	Q _{gd}			24			
Gate Resistance	R _g		1.5		6.2	Ω	
Turn-On Delay Time ^c	t _{d(on)}	V _{DD} = 50 V, R _L = 0.6 Ω I _D ≅ 85 A, V _{GEN} = 10 V, R _g = 2.5 Ω		20	30	ns	
Rise Time ^c	t _r			125	200		
Turn-Off Delay Time ^c	t _{d(off)}			55	85		
Fall Time ^c	t _f			130	195		
Source-Drain Diode Ratings and Characteristics (T_C = 25 °C)^b							
Continuous Current	I _S				110	A	
Pulsed Current	I _{SM}				240		
Forward Voltage ^a	V _{SD}	I _F = 85 A, V _{GS} = 0 V		1.0	1.5	V	
Reverse Recovery Time	t _{rr}	I _F = 50 A, di/dt = 100 A/μs		70	140	ns	
Peak Reverse Recovery Current	I _{RM(REC)}				5.5	10	A
Reverse Recovery Charge	Q _{rr}				0.19	0.35	μC

Notes

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

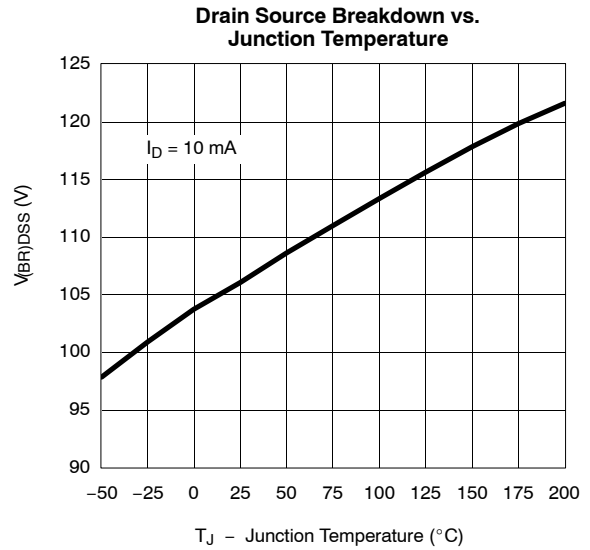
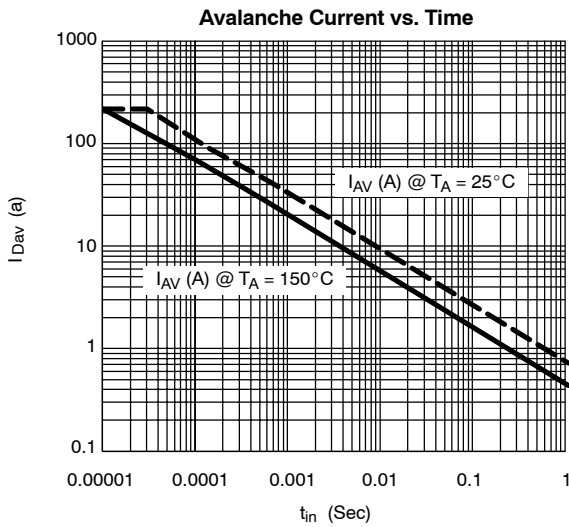
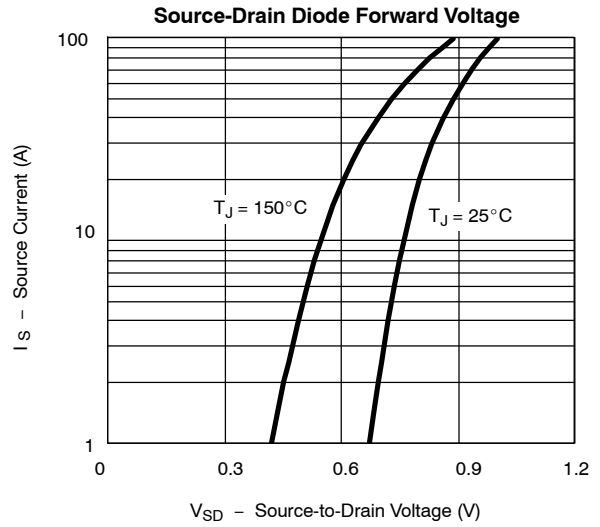
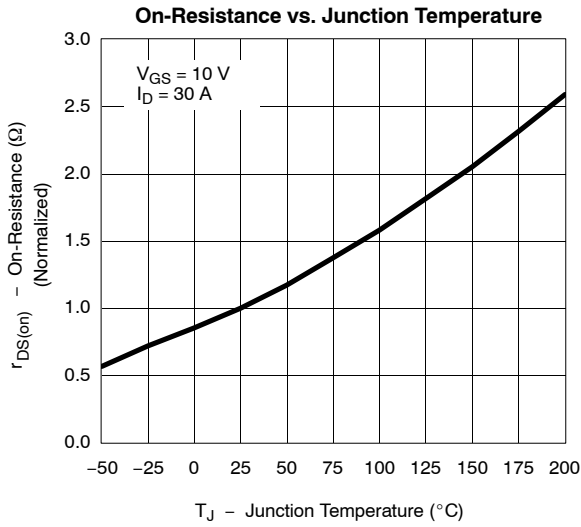


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)





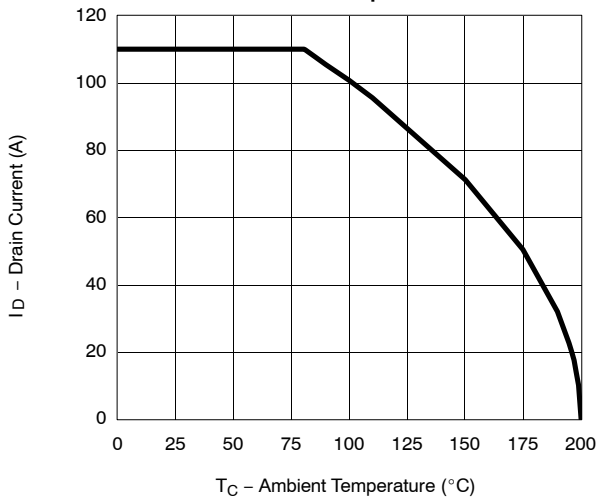
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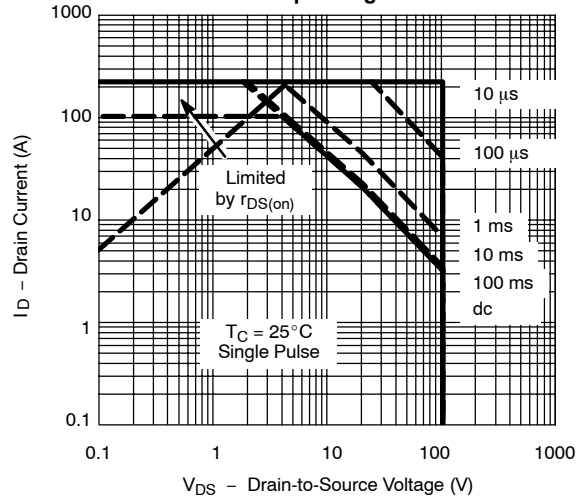


THERMAL RATINGS

Maximum Avalanche and Drain Current vs. Case Temperature



Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Case

