



N-Channel 30-V (D-S) 175°C MOSFET

PRODUCT SUMMARY		
$V_{(BR)DSS}$ (V)	$r_{DS(on)}$ (Ω)	I_D (A) ^a
30	0.0025 @ $V_{GS} = 10$ V	110 ^a

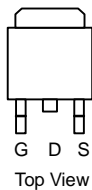
FEATURES

- TrenchFET® Power MOSFET
- 175°C Junction Temperature
- Low Thermal Resistance Package
- High Threshold Voltage

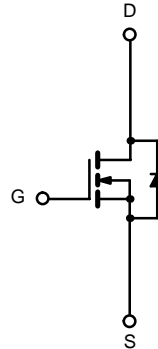
APPLICATIONS

- Automotive 12-V Boardnet

TO-263



DRAIN connected to TAB



N-Channel MOSFET

Ordering Information: SUM110N03-03

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	A
	$T_C = 100^\circ\text{C}$		110 ^a	
Pulsed Drain Current		I_{DM}	350	
Avalanche Current		I_{AR}	70	
Repetitive Avalanche Energy ^b	$L = 0.1$ mH	E_{AR}	245	mJ
Maximum Power Dissipation ^b	$T_C = 25^\circ\text{C}$	P_D	242 ^c	W
	$T_A = 25^\circ\text{C}$ ^d		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) ^d	R_{thJA}	40	$^\circ\text{C/W}$
Junction-to-Case	R_{thJC}	0.62	

Notes

- Package limited.
- Duty cycle $\leq 1\%$.
- See SOA curve for voltage derating.
- 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	2.5		4.5	
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ±20 V			±100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 24 V, V _{GS} = 0 V			1	μA
		V _{DS} = 24 V, V _{GS} = 0 V, T _J = 125 °C			50	
		V _{DS} = 24 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		0.002	0.0025	Ω
		V _{GS} = 10 V, I _D = 30 A, T _J = 125 °C			0.0037	
		V _{GS} = 10 V, I _D = 30 A, T _J = 175 °C			0.0044	
Forward Transconductance ^a	g _{fs}	V _{DS} = 15 V, I _D = 30 A	15			S
Dynamic^b						
Input Capacitance	C _{iss}	V _{GS} = 0 V, V _{DS} = 25 V, f = 1 MHz		12500		pF
Output Capacitance	C _{oss}			1650		
Reverse Transfer Capacitance	C _{rss}			970		
Total Gate Charge ^b	Q _g	V _{DS} = 15 V, V _{GS} = 10 V, I _D = 110 A		170	250	nC
Gate-Source Charge ^b	Q _{gs}			57		
Gate-Drain Charge ^b	Q _{gd}			30		
Turn-On Delay Time ^b	t _{d(on)}	V _{DD} = 15 V, R _L = 0.18 Ω I _D ≅ 110 A, V _{GEN} = 10 V, R _G = 2.5 Ω		20	35	ns
Rise Time ^b	t _r			125	190	
Turn-Off Delay Time ^b	t _{d(off)}			70	105	
Fall Time ^b	t _f			25	40	
Source-Drain Diode Ratings and Characteristics (T_C = 25 °C)^c						
Continuous Current	I _S				110	A
Pulsed Current	I _{SM}				350	
Forward Voltage ^a	V _{SD}	I _F = 50 A, V _{GS} = 0 V		0.9	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}			3	4.5	A
Reverse Recovery Charge	Q _{rr}				0.1	0.31

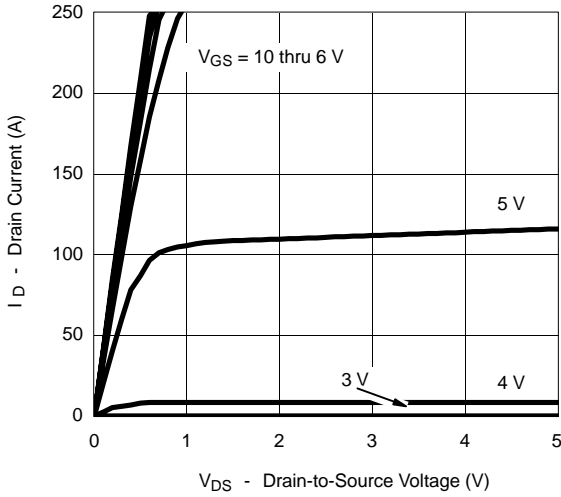
Notes

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

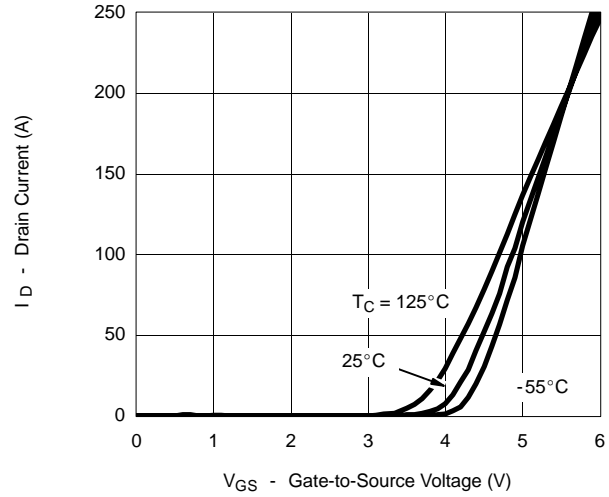


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

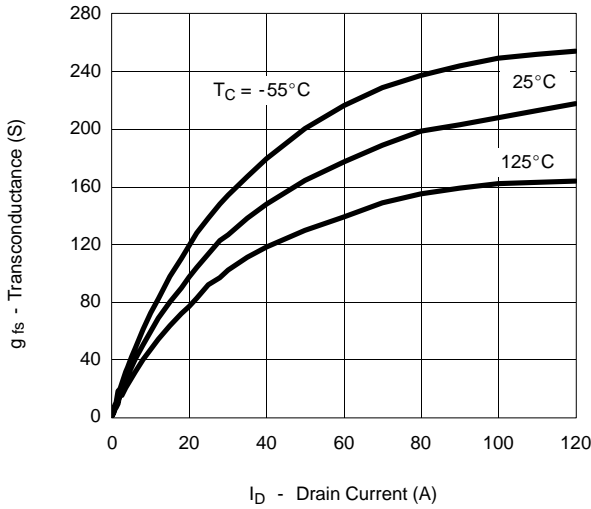
Output Characteristics



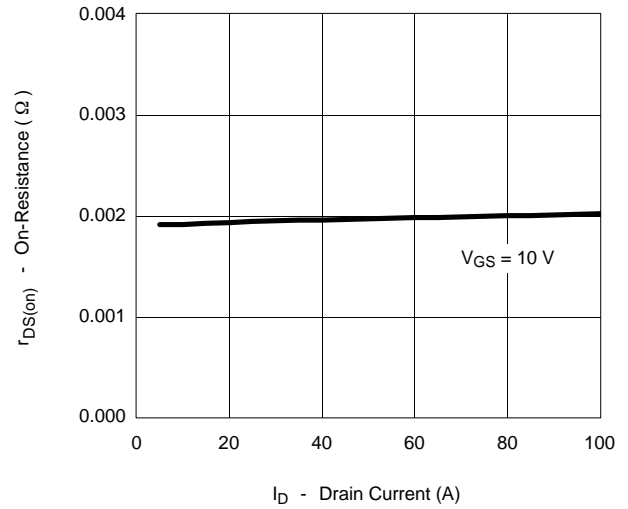
Transfer Characteristics



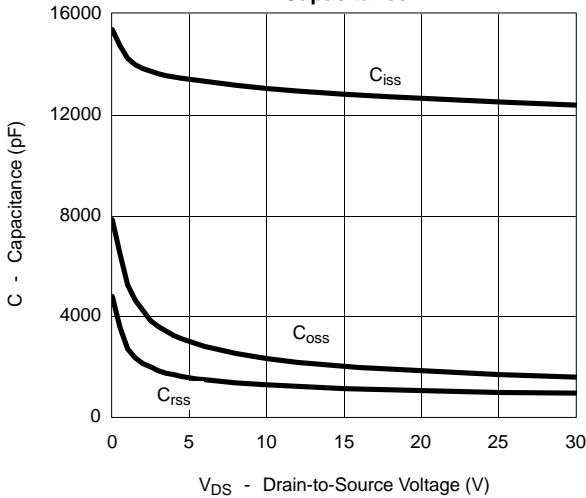
Transconductance



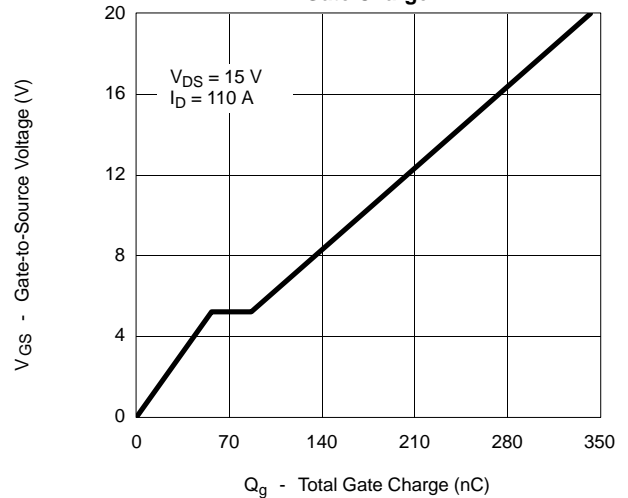
On-Resistance vs. Drain Current



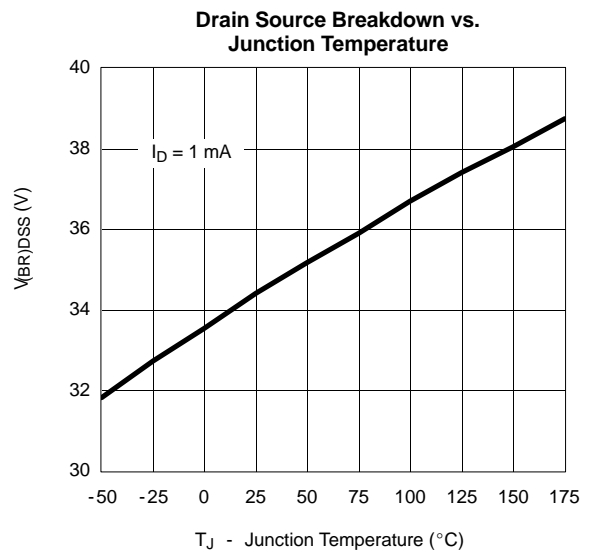
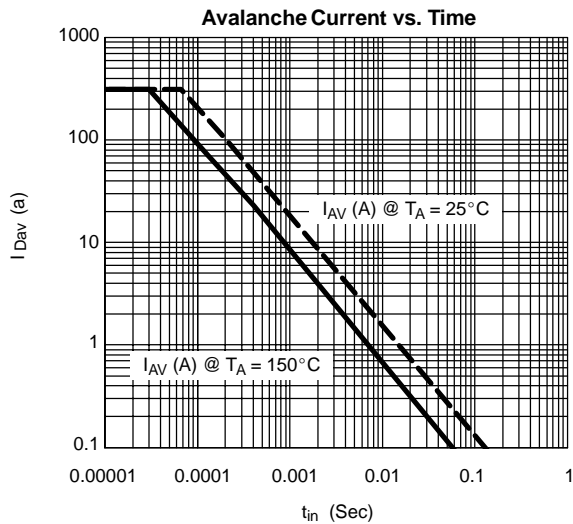
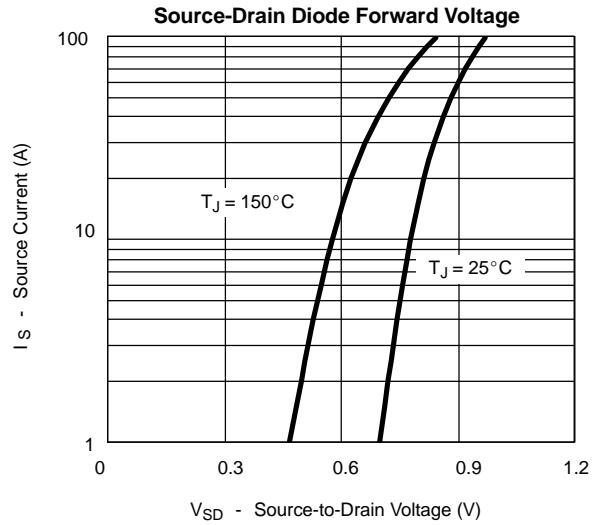
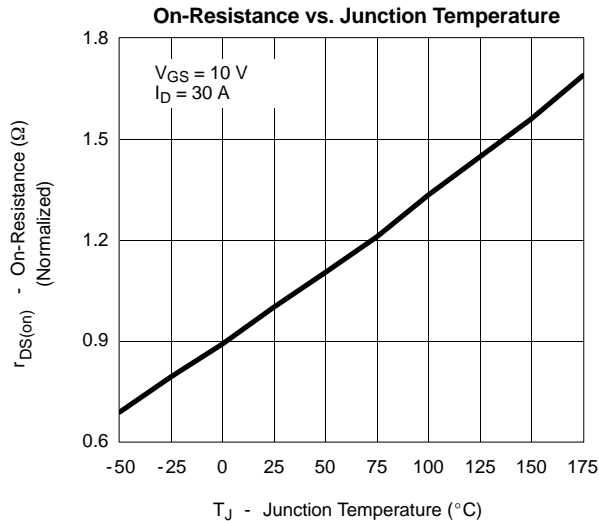
Capacitance



Gate Charge



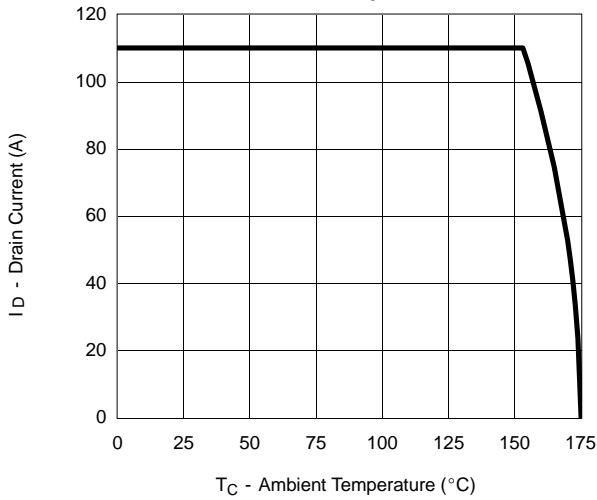
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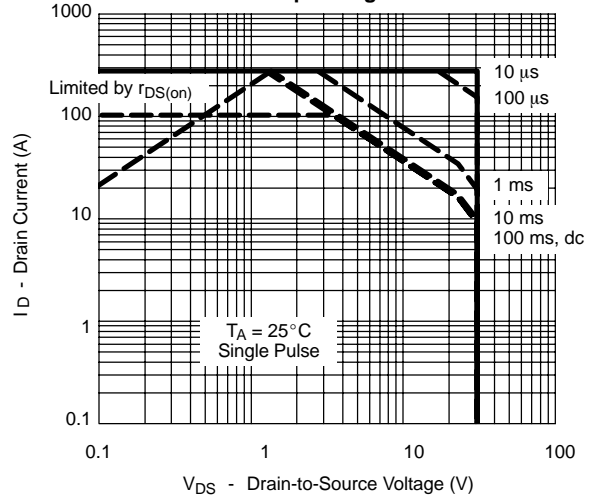


THERMAL RATINGS

Maximum Avalanche and Drain Current vs. Case Temperature



Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Case

