N-Channel 30-V (D-S) 175 °C MOSFET

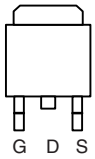
PRODUCT SUMMARY		
$V_{(BR)DSS}$ (V)	$r_{DS(on)}$ (Ω)	I_D (A)
30	0.0025 at V_{GS} = 10 V	110[a]

FEATURES

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

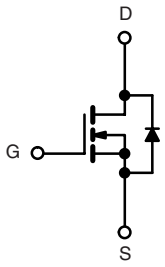
Available
RoHS* COMPLIANT

TO-263



Top View

DRAIN connected to TAB



N-Channel MOSFET

Ordering Information: SUM110N03-03
SUM110N03-03-E3 (Lead (Pb)-free)

ABSOLUTE MAXIMUM RATINGS T_A = 25 °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 °C)	T_C = 25 °C	I_D	110[a]	A
	T_C = 100 °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 °C	P_D	242[c]	W
	T_A = 25 °C[d]		3.75	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	- 55 to 175	°C

THERMAL RESISTANCE RATINGS				
Parameter		**Symbol**	**Limit**	**Unit**
Junction-to-Ambient	(PCB Mount)[d]	R_{thJA}	40	°C/W
Junction-to-Case		R_{thJC}	0.62	

Notes:
a. Package limited.
b. Duty cycle ≤ 1 %.
c. See SOA curve for voltage derating.
d. When Mounted on 1" square PCB (FR-4 material).

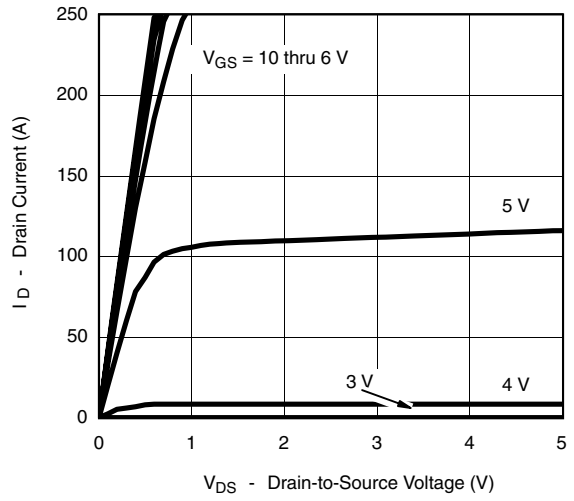
* Pb containing terminations are not RoHS compliant, exemptions may apply.

SPECIFICATIONS T_J = 25 °C, unless otherwise noted						
Parameter	**Symbol**	**Test Conditions**	**Min.**	**Typ.**	**Max.**	**Unit**
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 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]	$I_{D(on)}$	$V_{DS} \geq$ 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 $I_D \cong$ 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 Charge	I_{RM}			3	4.5	A
Reverse Recovery Charge	Q_{rr}			0.1	0.31	µC

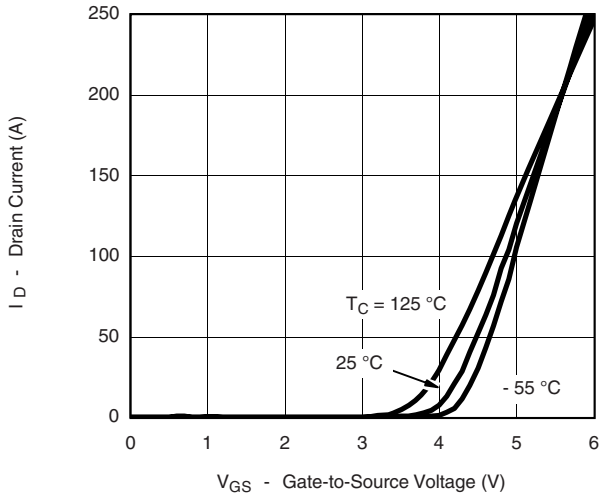
Notes:
a. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2 %.
b. Independent of operating temperature.
c. Guaranteed by design, not subject to production testing.

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

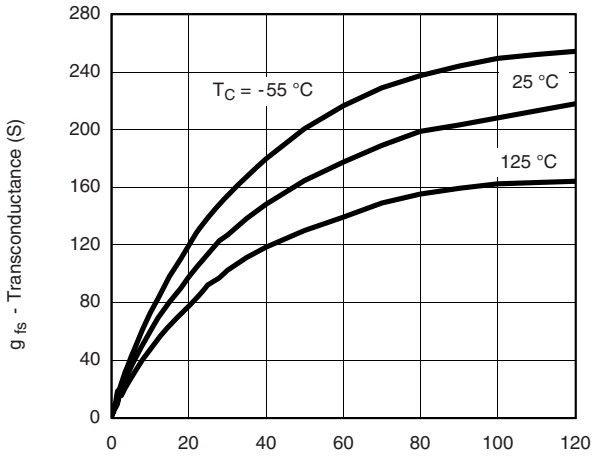
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



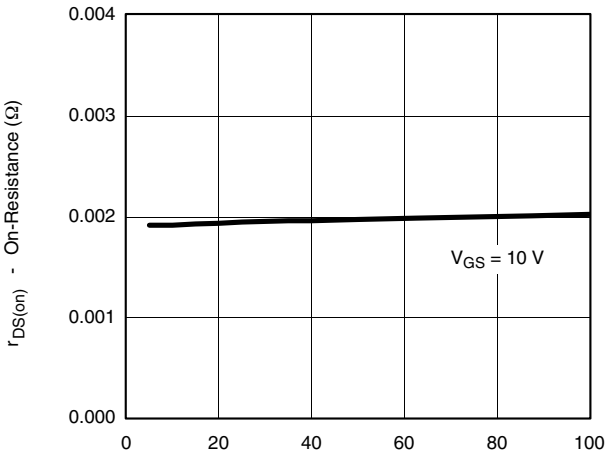
Output Characteristics



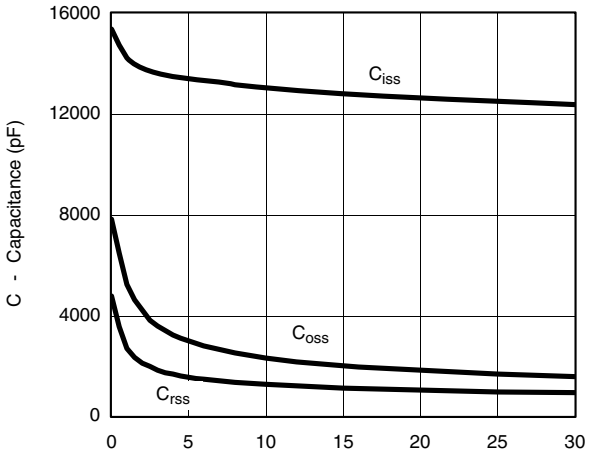
Transfer Characteristics



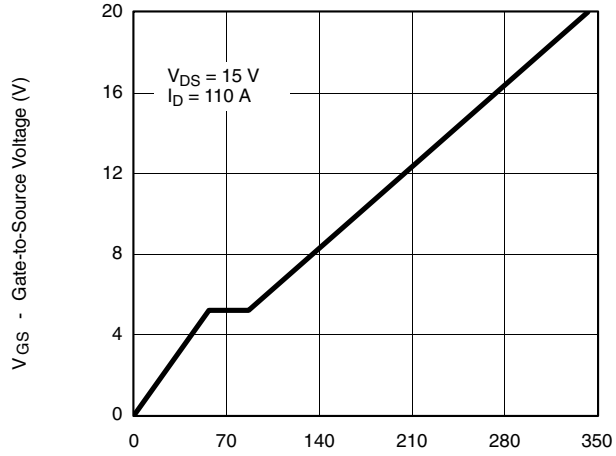
Transconductance



On-Resistance vs. Drain Current

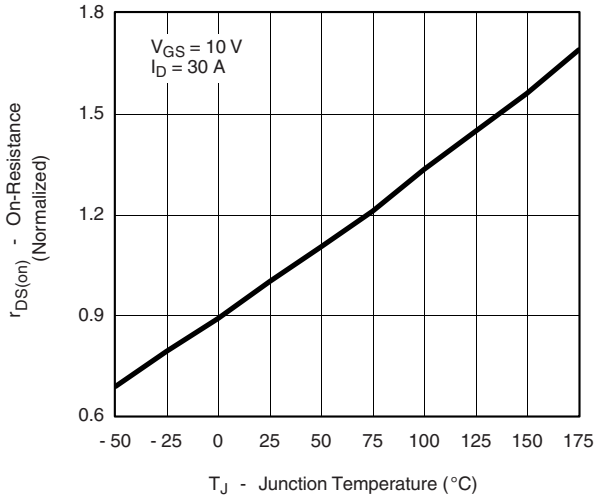


Capacitance

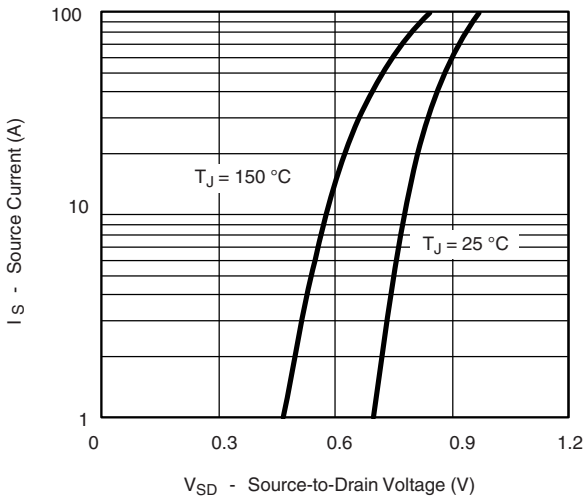


Gate Charge

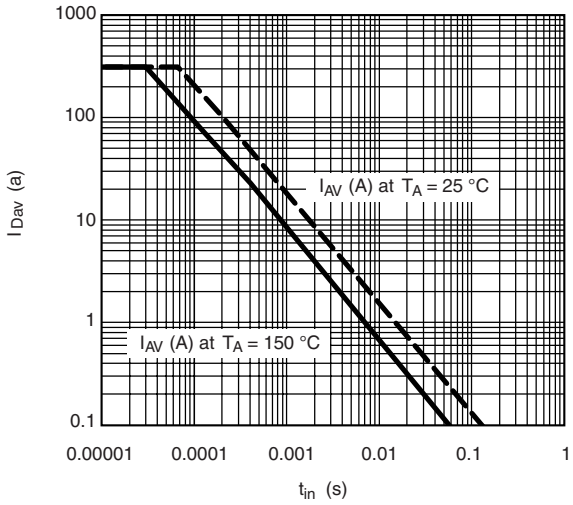
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



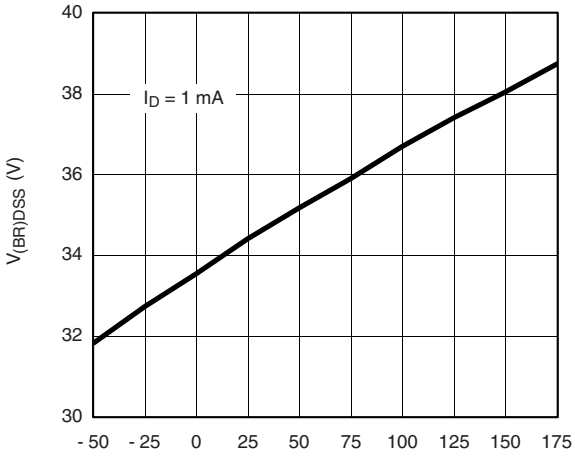
On-Resistance vs. Junction Temperature



Source-Drain Diode Forward Voltage

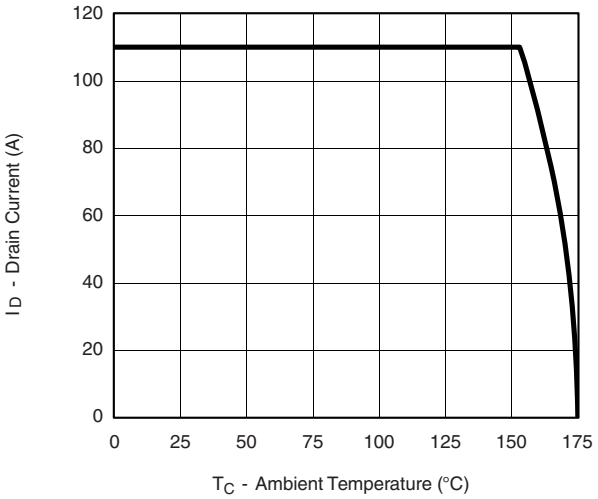


Avalanche Current vs. Time

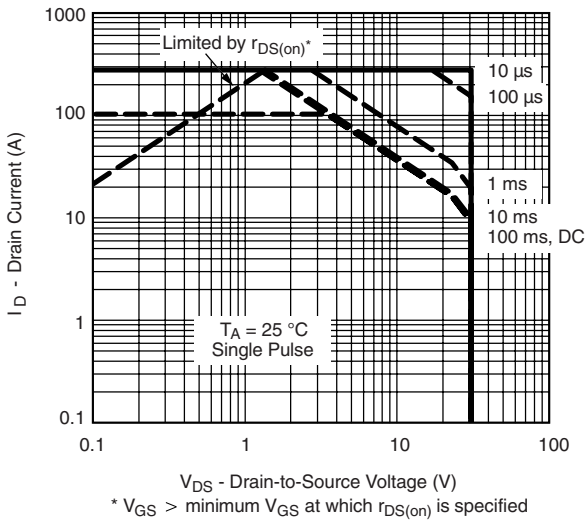


Drain Source Breakdown vs. Junction Temperature

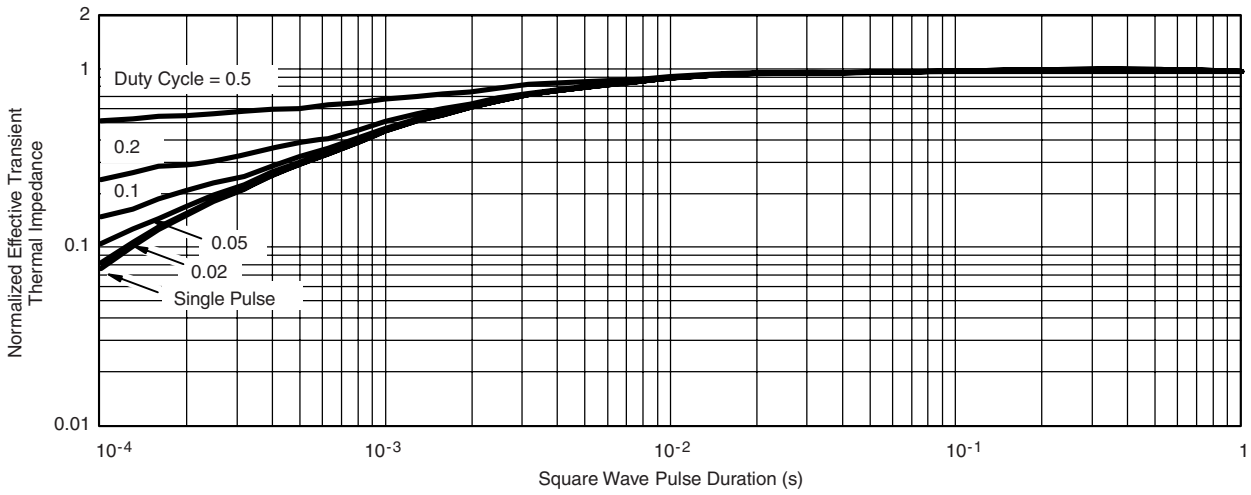
THERMAL RATINGS



Maximum Avalanche and Drain Current vs. Case Temperature



Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Case

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