



## P-Channel 80-V (D-S) MOSFET

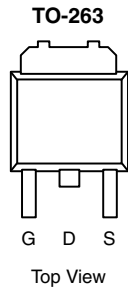
PRODUCT SUMMARY			
V <sub>DS</sub> (V)	r <sub>DS(on)</sub> (Ω)	I <sub>D</sub> (A) <sup>b</sup>	Q <sub>g</sub> (Typ)
- 80	0.0112 at V <sub>GS</sub> = - 10 V	- 110	85 nC
	0.0145 at V <sub>GS</sub> = - 4.5 V	- 109	

### FEATURES

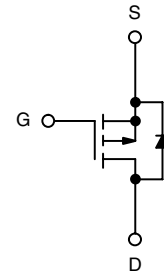
- TrenchFET<sup>®</sup> Power MOSFET



RoHS  
COMPLIANT



Drain Connected to Tab



P-Channel MOSFET

Ordering Information: SUM110P08-11L-E3 (Lead (Pb)-free)

ABSOLUTE MAXIMUM RATINGS T <sub>A</sub> = 25 °C, unless otherwise noted			
Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V <sub>DS</sub>	- 80	V
Gate-Source Voltage	V <sub>GS</sub>	± 20	
Continuous Drain Current (T <sub>J</sub> = 175 °C)	T <sub>C</sub> = 25 °C	- 110 <sup>a</sup>	A
	T <sub>C</sub> = 125 °C	- 71	
	T <sub>A</sub> = 25 °C	- 23.5 <sup>b, c</sup>	
	T <sub>A</sub> = 125 °C	13.6 <sup>b, c</sup>	
Pulsed Drain Current	I <sub>DM</sub>	- 120	
Continuous Source-Drain Diode Current	T <sub>C</sub> = 25 °C	- 110	
	T <sub>A</sub> = 25 °C	- 9 <sup>b, c</sup>	
Avalanche Current	I <sub>AS</sub>	- 75	
Single-Pulse Avalanche Energy	E <sub>AS</sub>	281	mJ
Maximum Power Dissipation	T <sub>C</sub> = 25 °C	375	W
	T <sub>C</sub> = 125 °C	125	
	T <sub>A</sub> = 25 °C	13.6 <sup>b, c</sup>	
	T <sub>A</sub> = 125 °C	4.5 <sup>b, c</sup>	
Operating Junction and Storage Temperature Range	T <sub>J</sub> , T <sub>stg</sub>	- 55 to 175	°C

THERMAL RESISTANCE RATINGS					
Parameter	Symbol	Typical	Maximum	Unit	
Maximum Junction-to-Ambient <sup>b, d</sup>	R <sub>thJA</sub>	8	11	°C/W	
Maximum Junction-to-Case (Drain)	R <sub>thJC</sub>	0.33	0.4		

Notes:

- Package limited.
- Surface Mounted on 1" x 1" FR4 board.
- t = 10 s.
- Maximum under Steady State conditions is °C/W.



<b>SPECIFICATIONS</b> $T_J = 25\text{ }^\circ\text{C}$ , unless otherwise noted						
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
<b>Static</b>						
Drain-Source Breakdown Voltage	$V_{DS}$	$V_{GS} = 0\text{ V}, I_D = -250\text{ }\mu\text{A}$	- 80			V
$V_{DS}$ Temperature Coefficient	$\Delta V_{DS}/T_J$	$I_D = -1\text{ }\mu\text{A}$		- 85		mV/°C
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}/T_J$			- 5.5		
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\text{ }\mu\text{A}$	- 1		- 3	V
Gate-Source Leakage	$I_{GSS}$	$V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = -80\text{ V}, V_{GS} = 0\text{ V}$			- 1	$\mu\text{A}$
		$V_{DS} = -80\text{ V}, V_{GS} = 0\text{ V}, T_J = 175\text{ }^\circ\text{C}$			- 500	
On-State Drain Current <sup>a</sup>	$I_{D(on)}$	$V_{DS} \geq 10\text{ V}, V_{GS} = -10\text{ V}$	- 120			A
Drain-Source On-State Resistance <sup>a</sup>	$r_{DS(on)}$	$V_{GS} = -10\text{ V}, I_D = -20\text{ A}$		0.0093	0.0112	$\Omega$
		$V_{GS} = -4.5\text{ V}, I_D = -15\text{ A}$		0.012	0.0145	
Forward Transconductance <sup>a</sup>	$g_{fs}$	$V_{DS} = -15\text{ V}, I_D = -20\text{ A}$		85		S
<b>Dynamic<sup>b</sup></b>						
Input Capacitance	$C_{iss}$	$V_{DS} = -40\text{ V}, V_{GS} = 0\text{ V}, f = 1\text{ MHz}$		10850		pF
Output Capacitance	$C_{oss}$			800		
Reverse Transfer Capacitance	$C_{rss}$			700		
Total Gate Charge	$Q_g$	$V_{DS} = -40\text{ V}, V_{GS} = -10\text{ V}, I_D = -110\text{ A}$		180	270	nC
				85	130	
Gate-Source Charge	$Q_{gs}$	$V_{DS} = -40\text{ V}, V_{GS} = -4.5\text{ V}, I_D = -110\text{ A}$		35		
Gate-Drain Charge	$Q_{gd}$			42		
Gate Resistance	$R_g$	$f = 1\text{ MHz}$		3.6		$\Omega$
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = -40\text{ V}, R_L = 0.36\text{ }\Omega$ $I_D \cong -110\text{ A}, V_{GEN} = -10\text{ V}, R_g = 1\text{ }\Omega$		20	30	ns
Rise Time	$t_r$			330	500	
Turn-Off Delay Time	$t_{d(off)}$			135	205	
Fall Time	$t_f$			550	825	
<b>Drain-Source Body Diode Characteristics</b>						
Continuous Source-Drain Diode Current	$I_S$	$T_C = 25\text{ }^\circ\text{C}$			- 110	A
Pulse Diode Forward Current <sup>a</sup>	$I_{SM}$				- 120	
Body Diode Voltage	$V_{SD}$	$I_S = -20\text{ A}$		- 0.8	- 1.5	V
Body Diode Reverse Recovery Time	$t_{rr}$	$I_F = -20\text{ A}, di/dt = 100\text{ A}/\mu\text{s}, T_J = 25\text{ }^\circ\text{C}$		65	100	ns
Body Diode Reverse Recovery Charge	$Q_{rr}$			135	205	nC
Reverse Recovery Fall Time	$t_a$			43		ns
Reverse Recovery Rise Time	$t_b$			22		

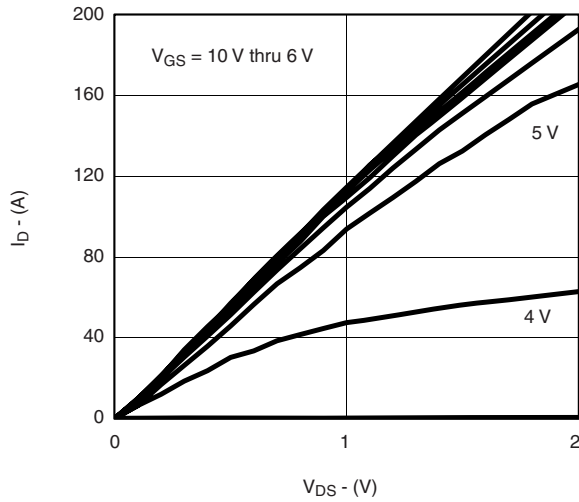
## Notes:

- a. Pulse test; pulse width  $\leq 300\text{ }\mu\text{s}$ , duty cycle  $\leq 2\%$ .  
b. Guaranteed by design, not subject to production testing.

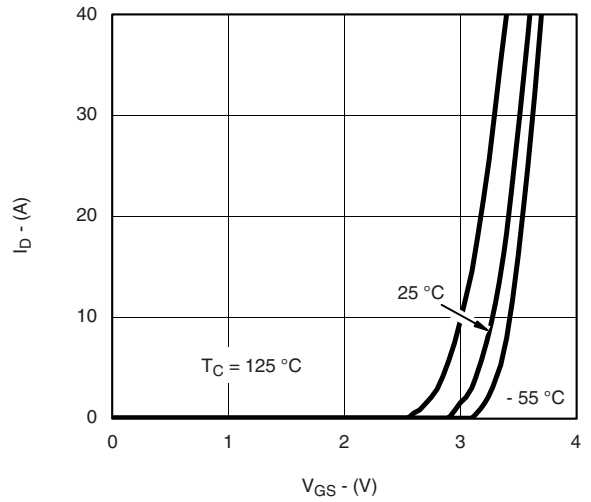
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure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



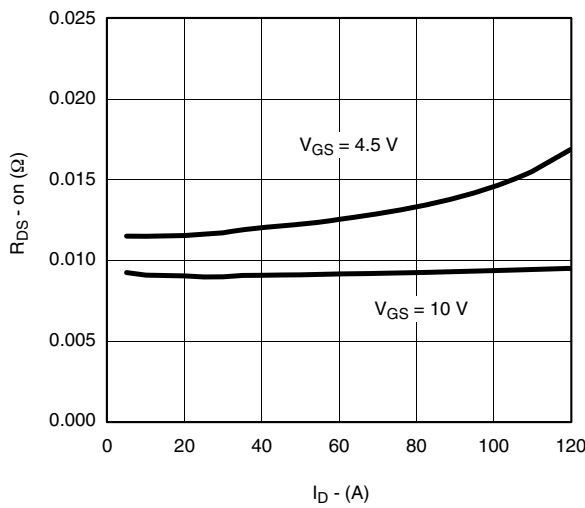
**TYPICAL CHARACTERISTICS** 25 °C, unless otherwise noted



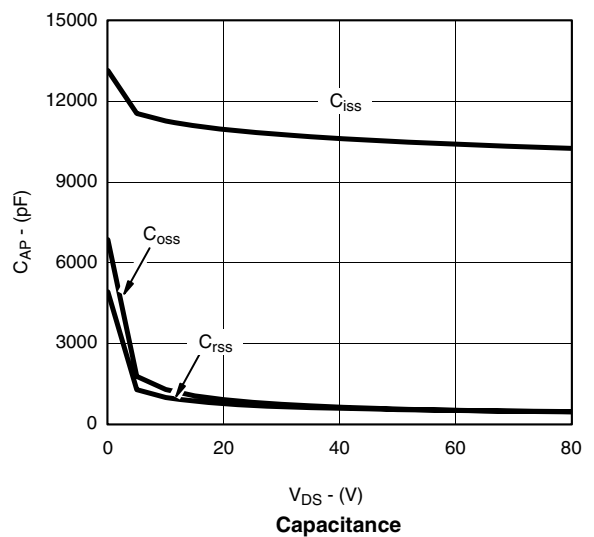
**Output Characteristics**



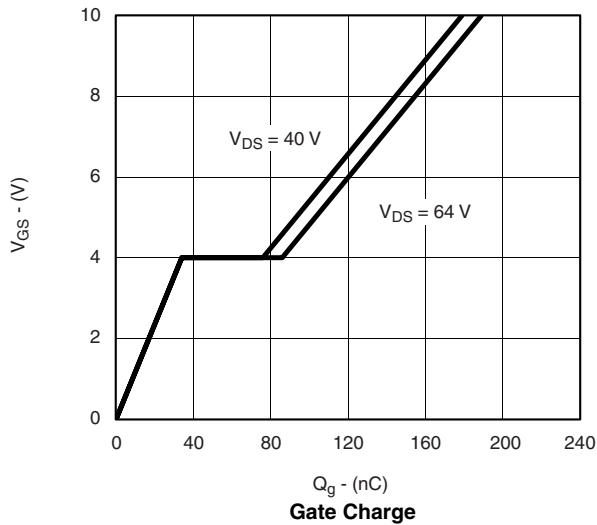
**Transfer Characteristics**



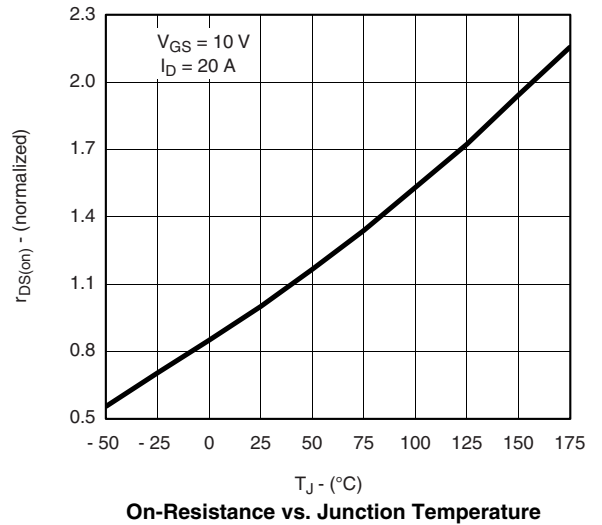
**On-Resistance vs. Drain Current**



**Capacitance**



**Gate Charge**



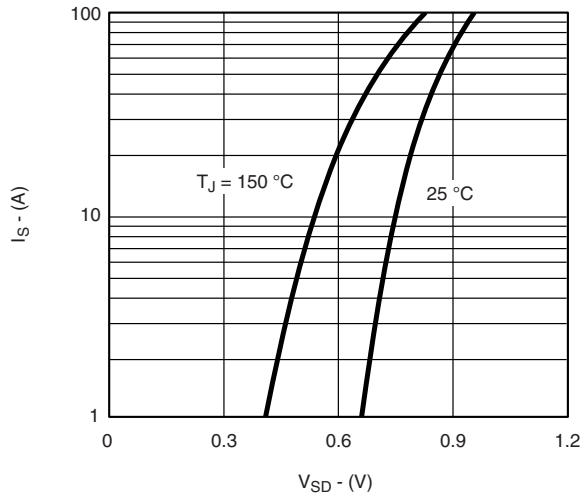
**On-Resistance vs. Junction Temperature**

# SUM110P08-11L

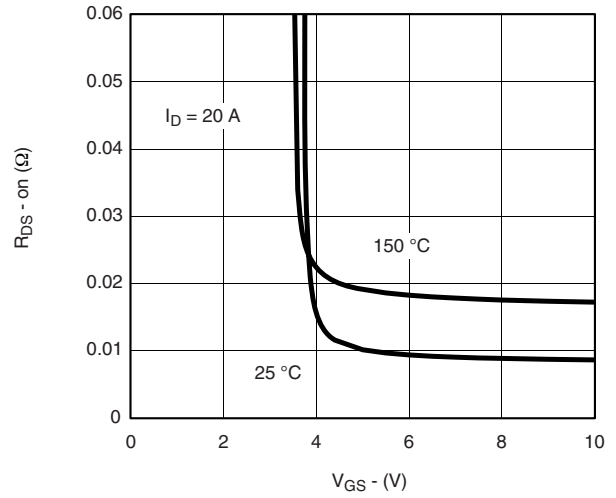


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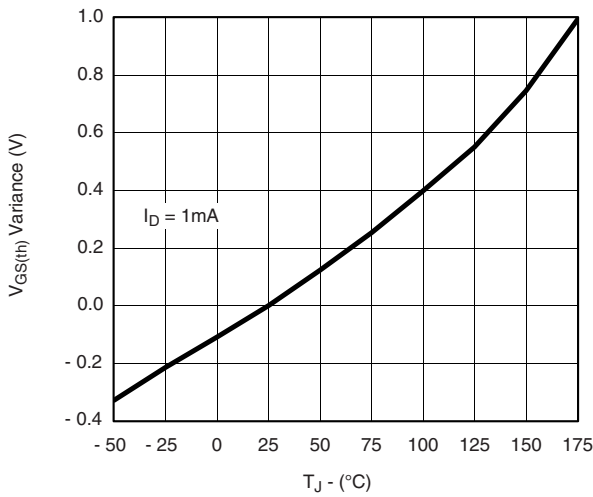
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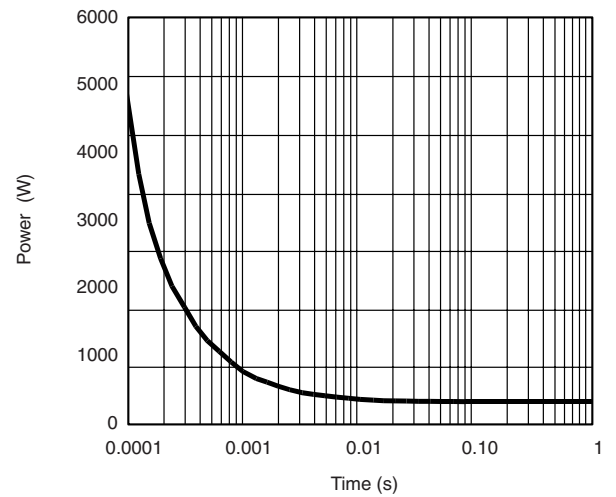
Source-Drain Diode Forward Voltage



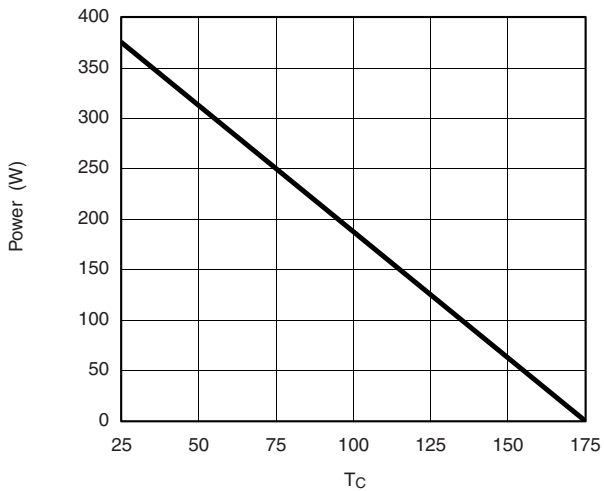
On-Resistance vs. Gate-to-Source Voltage



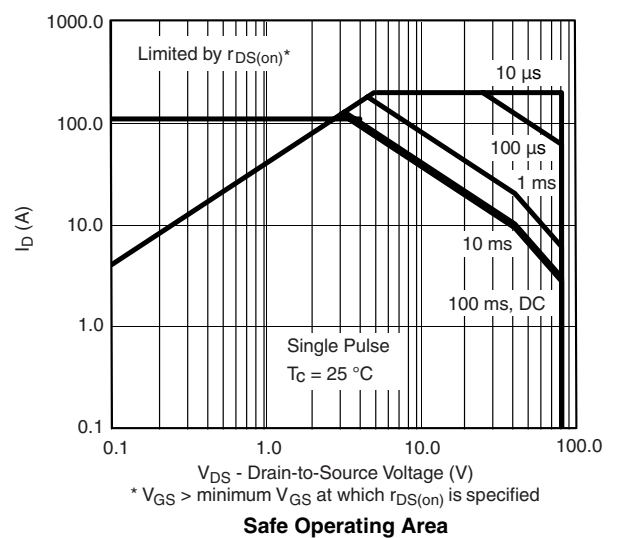
Threshold Voltage



Single Pulse Power, Junction-to-Case ( $T_C = 25\text{ °C}$ )



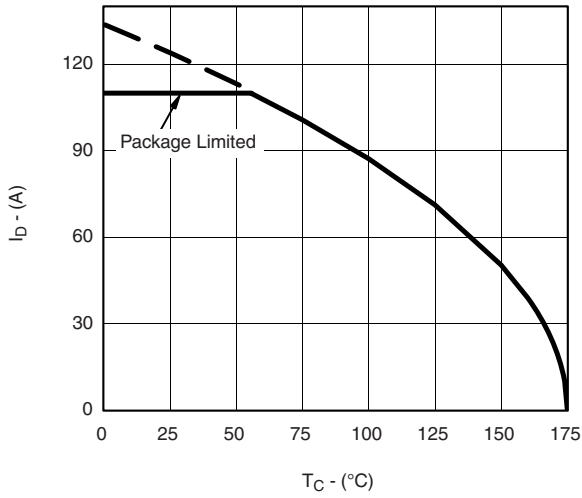
Power Derating, Junction-to-Case



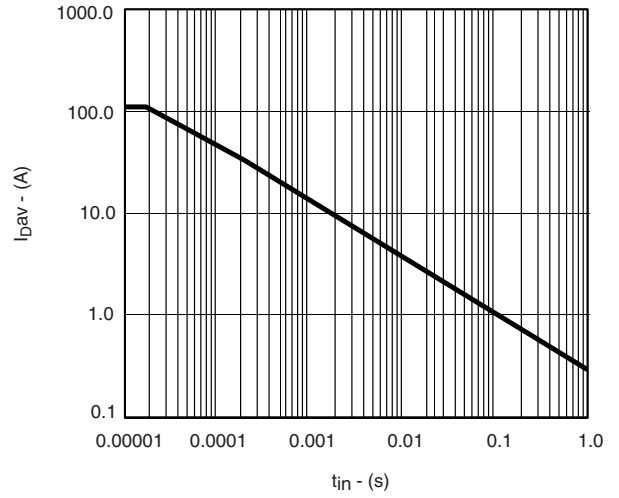
Safe Operating Area



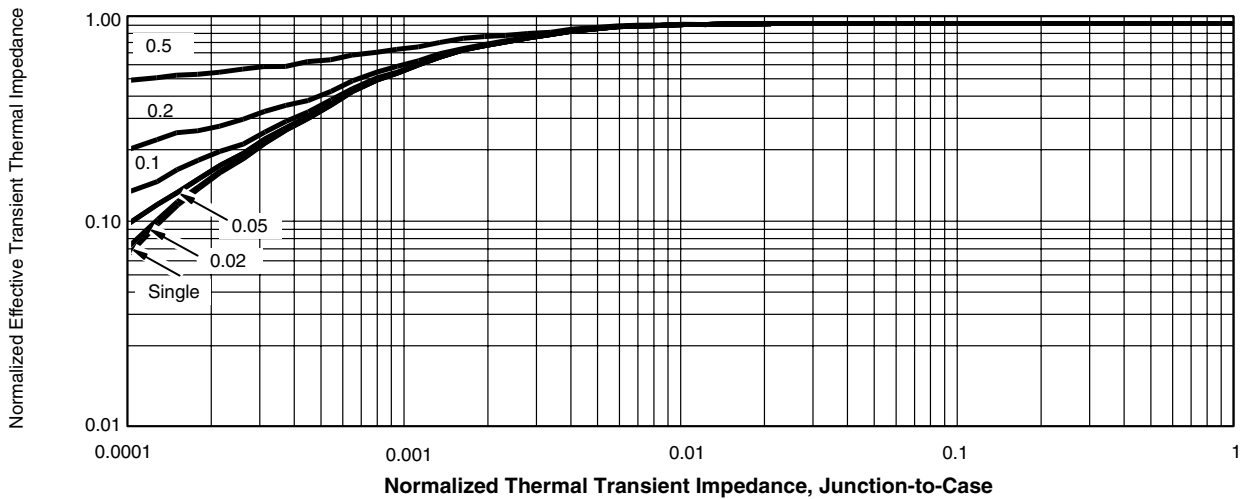
**TYPICAL CHARACTERISTICS** 25 °C, unless otherwise noted



**Max Avalanche and Drain Current vs. Case Temperature**



**Avalanche Current vs. Time**



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