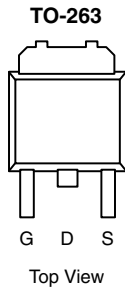


## P-Channel 80-V (D-S) MOSFET

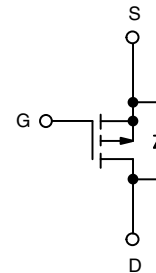
PRODUCT SUMMARY			
V <sub>DS</sub> (V)	r <sub>DS(on)</sub> (Ω)	I <sub>D</sub> (A) <sup>b</sup>	Q <sub>g</sub> (Typ)
- 80	0.0111 at V <sub>GS</sub> = - 10 V	- 110	113 nC

### FEATURES

- TrenchFET<sup>®</sup> Power MOSFET



Drain Connected to Tab



P-Channel MOSFET

Ordering Information: SUM110P08-11 (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> = 150 °C)	I <sub>D</sub>	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	I <sub>S</sub>	T <sub>C</sub> = 25 °C	110 <sup>a</sup>	
		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	P <sub>D</sub>	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 sec.
- 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	$\Delta V_{DS}/T_J$	$I_D = -250\text{ }\mu\text{A}$		- 85		mV/°C
$V_{GS(th)}$ Temperature Coefficient	$\Delta V_{GS(th)}/T_J$			7.0		
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\text{ }\mu\text{A}$	- 2		- 4	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>	$r_{DS(on)}$	$V_{GS} = -10\text{ V}, I_D = -20\text{ A}$		0.092	0.0111	$\Omega$
Forward Transconductance <sup>a</sup>	$g_{fs}$	$V_{DS} = -15\text{ V}, I_D = -20\text{ A}$		80		S
<b>Dynamic<sup>b</sup></b>						
Input Capacitance	$C_{iss}$	$V_{DS} = -40\text{ V}, V_{GS} = 0\text{ V}, f = 1\text{ MHz}$		11500		pF
Output Capacitance	$C_{oss}$			790		
Reverse Transfer Capacitance	$C_{rss}$			700		
Total Gate Charge	$Q_g$	$V_{DS} = -40\text{ V}, V_{GS} = -10\text{ V}, I_D = -110\text{ A}$		185	280	nC
Gate-Source Charge	$Q_{gs}$			40		
Gate-Drain Charge	$Q_{gd}$			45		
Gate Resistance	$R_g$	$f = 1\text{ MHz}$		3.6		$\Omega$
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = -40\text{ V}, R_L = 0.36\text{ }\Omega$ $I_D \cong -110\text{ A}, V_{GEN} = -10\text{ V}, R_g = 1\text{ }\Omega$		25	40	ns
Rise Time	$t_r$			410	620	
Turn-Off Delay Time	$t_{d(off)}$			145	220	
Fall Time	$t_f$			470	710	
<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		

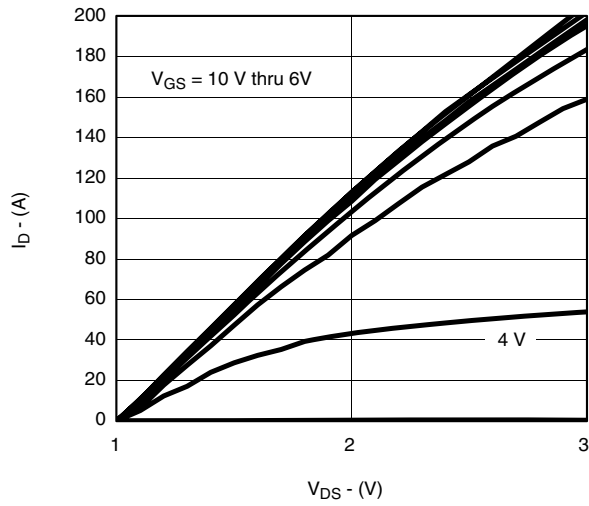
## Notes:

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

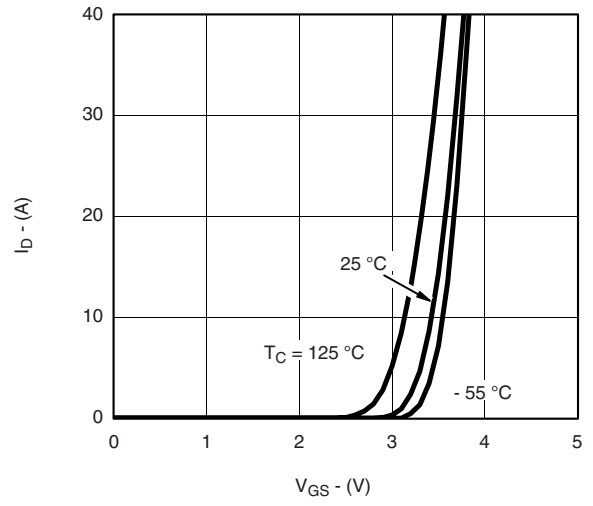
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure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



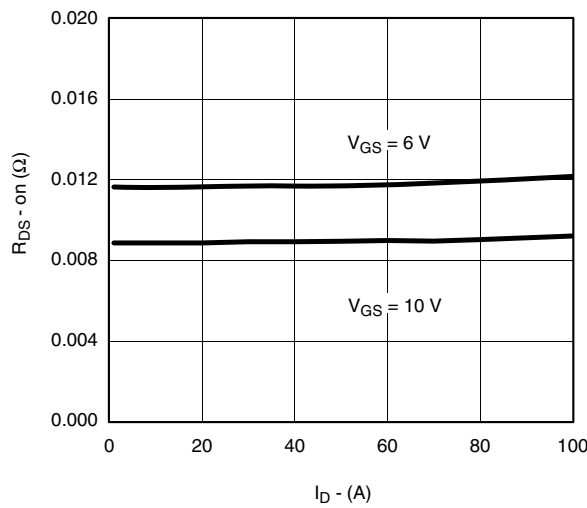
**TYPICAL CHARACTERISTICS** 25 °C, unless otherwise noted



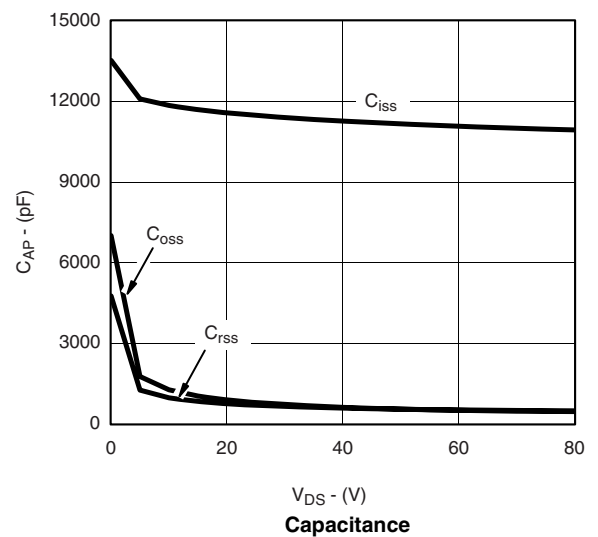
Output Characteristics



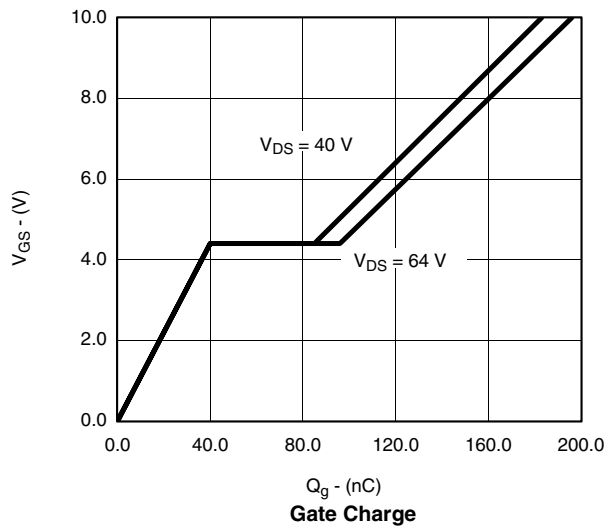
Transfer Characteristics



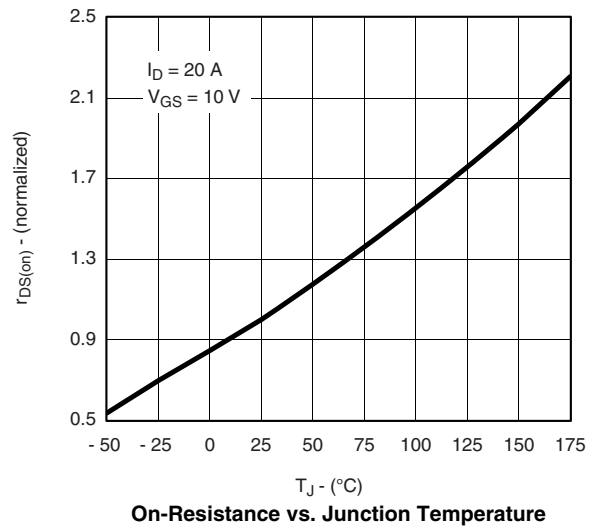
On-Resistance vs. Drain Current



Capacitance



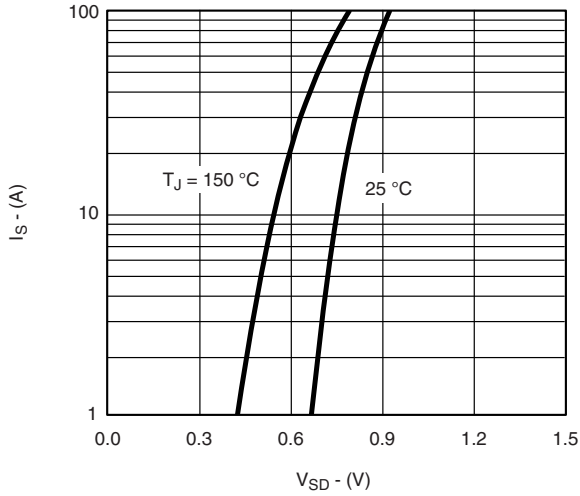
Gate Charge



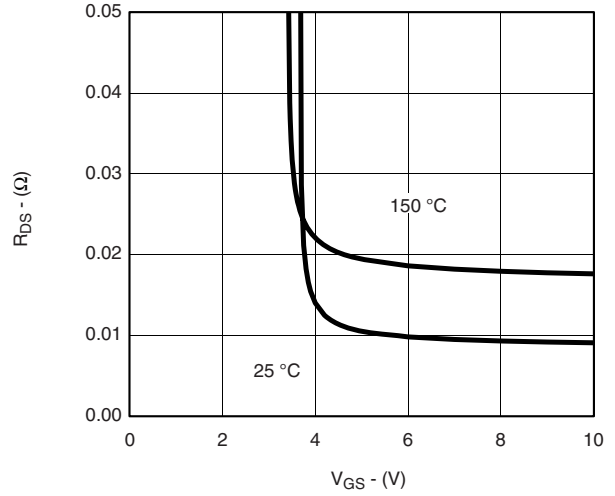
On-Resistance vs. Junction Temperature



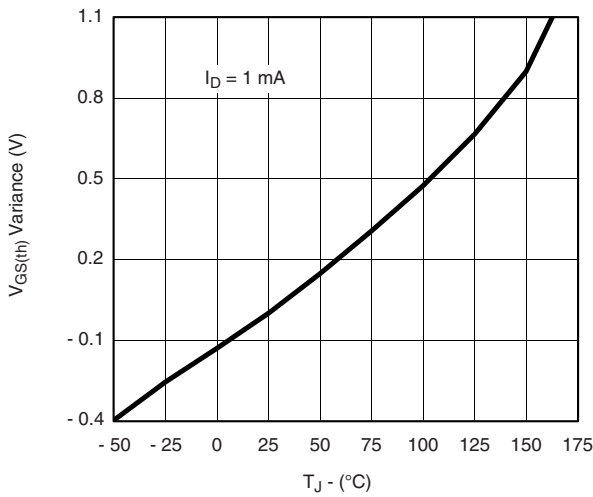
**TYPICAL CHARACTERISTICS** 25 °C, unless otherwise noted



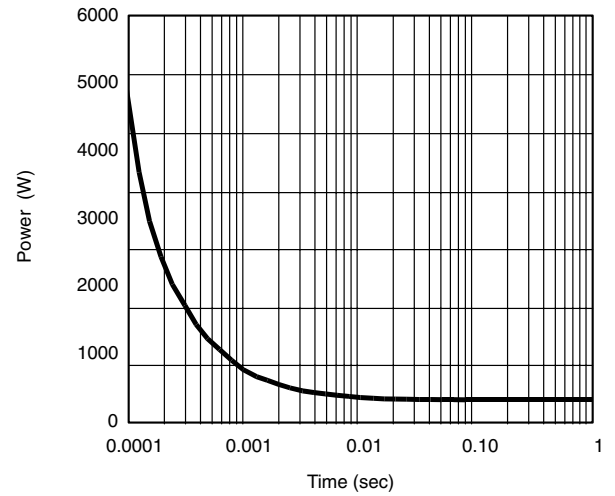
Source-Drain Diode Forward Voltage



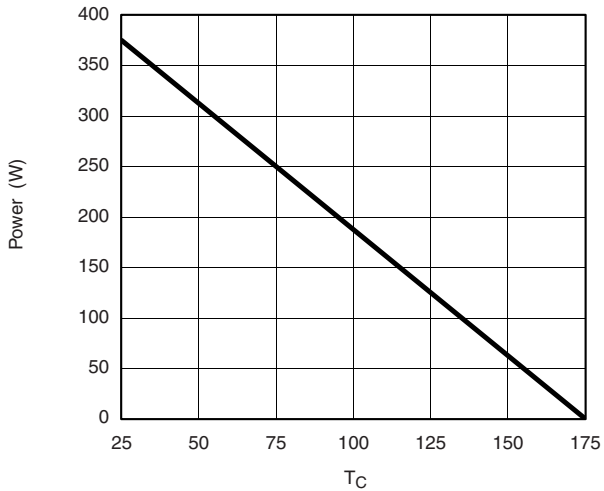
On-Resistance vs. Gate-to-Source Voltage



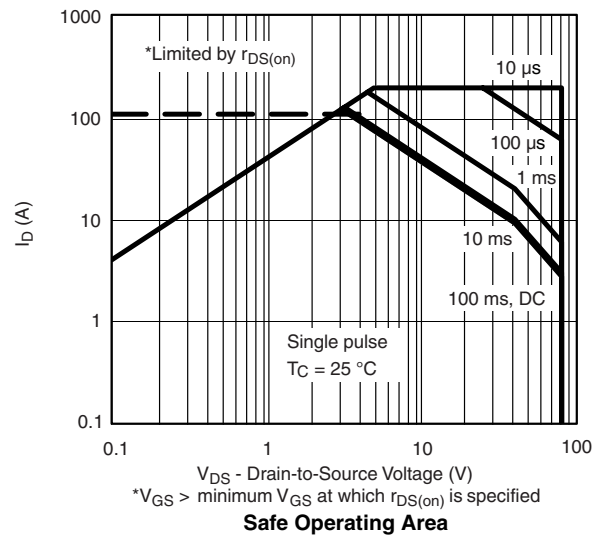
Threshold Voltage



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



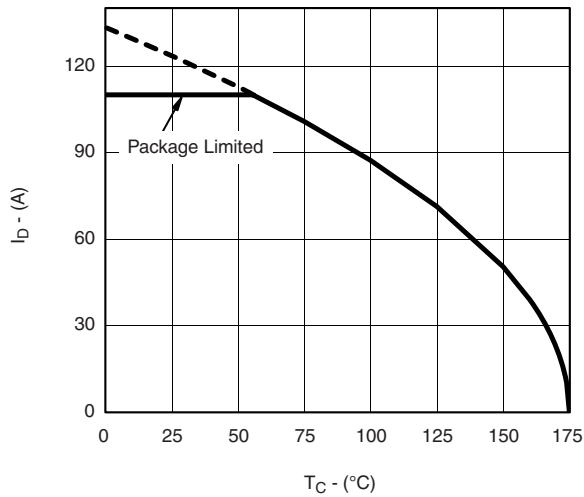
Power Derating (Junction-to-Case)



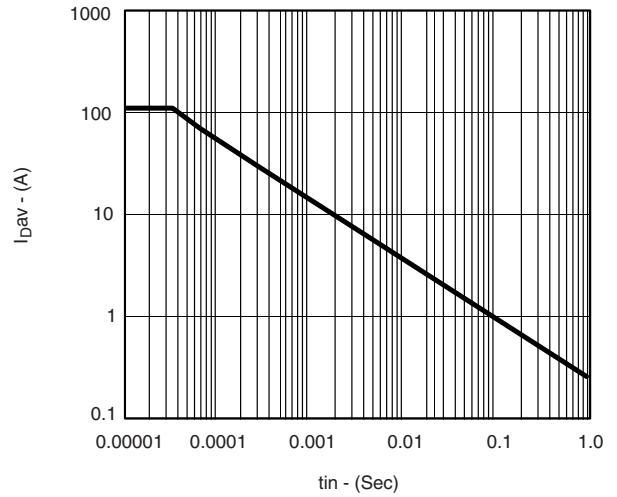
Safe Operating Area



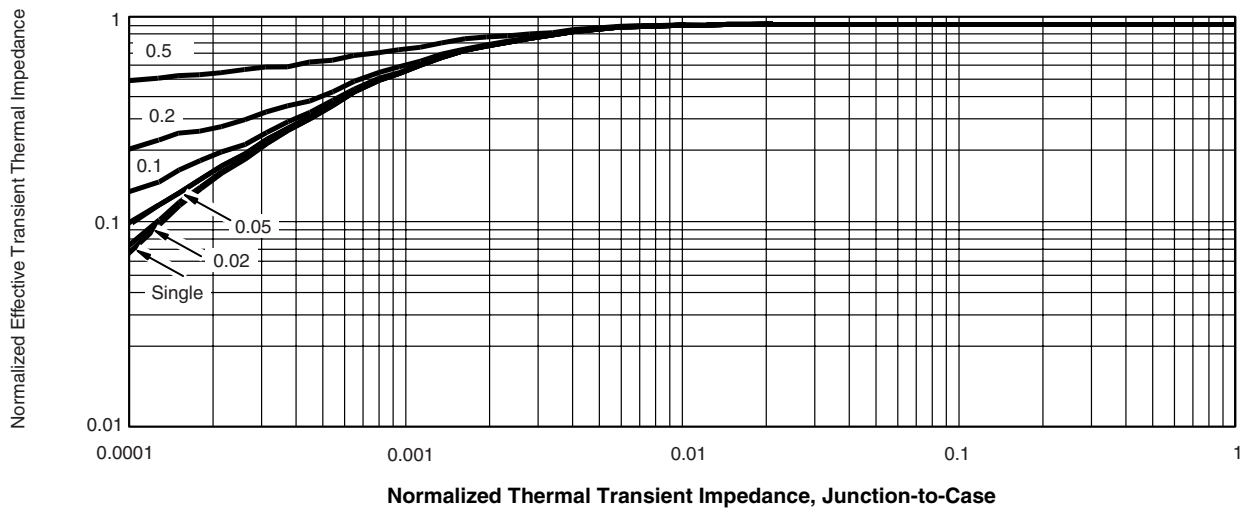
**TYPICAL CHARACTERISTICS** 25 °C, unless otherwise noted



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



**Avalanche Current vs. Time**



\*The power dissipation  $P_D$  is based on  $T_{J(max)} = 175\text{ °C}$ , using junction-to-case thermal resistance, and is more useful in settling the upper dissipation limit for cases where additional heatsinking is used. It is used to determine the current rating, when this rating falls below the package limit.

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