



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

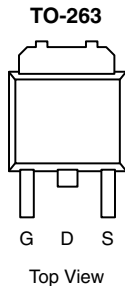
PRODUCT SUMMARY			
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A) ^b	Q_g (Typ)
- 80	0.0111 at $V_{GS} = -10$ V	- 110	113 nC

FEATURES

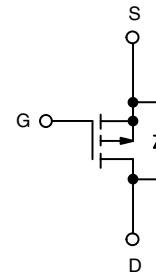
- TrenchFET[®] Power MOSFET



RoHS
COMPLIANT



Drain Connected to Tab



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

P-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS $T_A = 25$ °C, unless otherwise noted				
Parameter	Symbol	Limit	Unit	
Drain-Source Voltage	V_{DS}	- 80	V	
Gate-Source Voltage	V_{GS}	± 20		
Continuous Drain Current ($T_J = 150$ °C)	I_D	$T_C = 25$ °C	110 ^a	A
		$T_C = 125$ °C	71	
		$T_A = 25$ °C	23.5 ^{b, c}	
		$T_A = 125$ °C	13.6 ^{b, c}	
Pulsed Drain Current	I_{DM}	- 120		
Continuous Source-Drain Diode Current	I_S	$T_C = 25$ °C	110 ^a	
		$T_A = 25$ °C	- 9 ^{b, c}	
Avalanche Current	I_{AS}	- 75		
Single-Pulse Avalanche Energy	E_{AS}	281	mJ	
Maximum Power Dissipation	P_D	$T_C = 25$ °C	375	W
		$T_C = 125$ °C	125	
		$T_A = 25$ °C	13.6 ^{b, c}	
		$T_A = 125$ °C	4.5 ^{b, c}	
Operating Junction and Storage Temperature Range	T_J, T_{stg}	- 55 to 175	°C	

THERMAL RESISTANCE RATINGS					
Parameter	Symbol	Typical	Maximum	Unit	
Maximum Junction-to-Ambient ^{b, d}	R_{thJA}	8	11	°C/W	
Maximum Junction-to-Case (Drain)	R_{thJC}	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.

SPECIFICATIONS $T_J = 25\text{ }^\circ\text{C}$, unless otherwise noted						
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static						
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}	$V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -80\text{ V}, V_{GS} = 0\text{ V}$			- 1	μA
		$V_{DS} = -80\text{ V}, V_{GS} = 0\text{ V}, T_J = 175\text{ }^\circ\text{C}$			- 500	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} \geq 10\text{ V}, V_{GS} = -10\text{ V}$	120			A
Drain-Source On-State Resistance ^a	$r_{DS(on)}$	$V_{GS} = -10\text{ V}, I_D = -20\text{ A}$		0.092	0.0111	Ω
Forward Transconductance ^a	g_{fs}	$V_{DS} = -15\text{ V}, I_D = -20\text{ A}$		80		S
Dynamic^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		Ω
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	
Drain-Source Body Diode Characteristics						
Continuous Source-Drain Diode Current	I_S	$T_C = 25\text{ }^\circ\text{C}$			- 110	A
Pulse Diode Forward Current ^a	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		

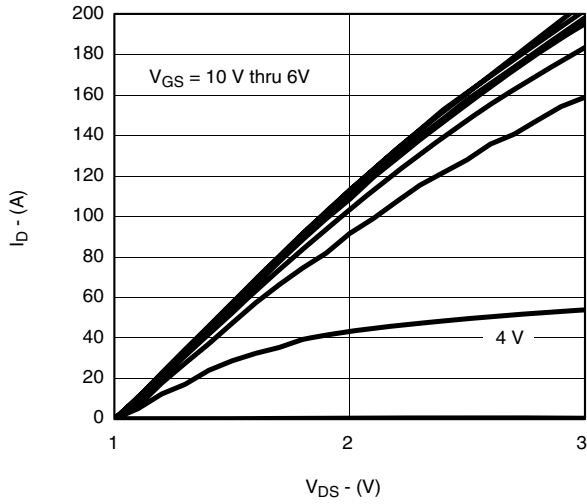
Notes:

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

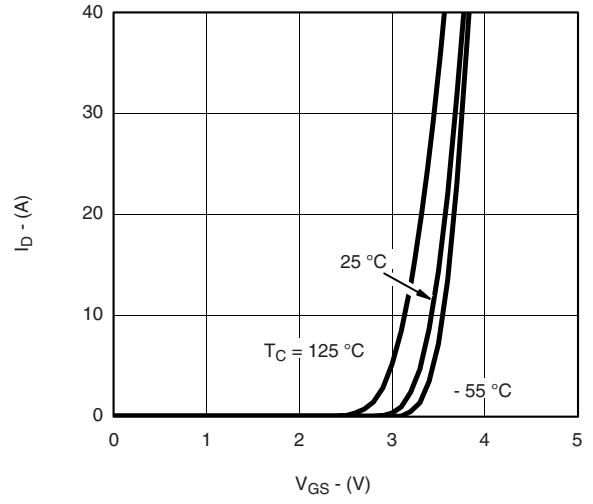
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure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



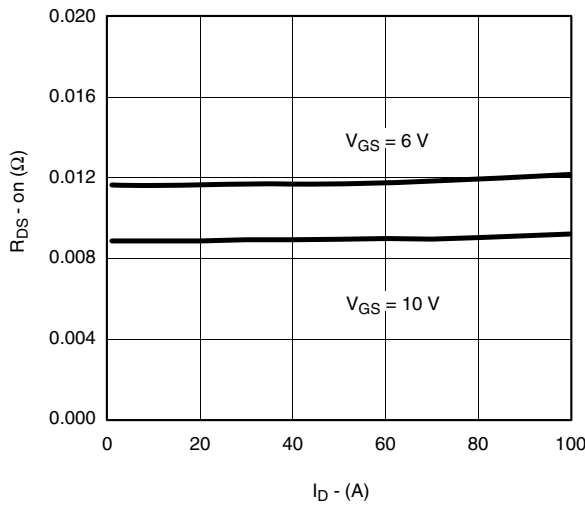
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



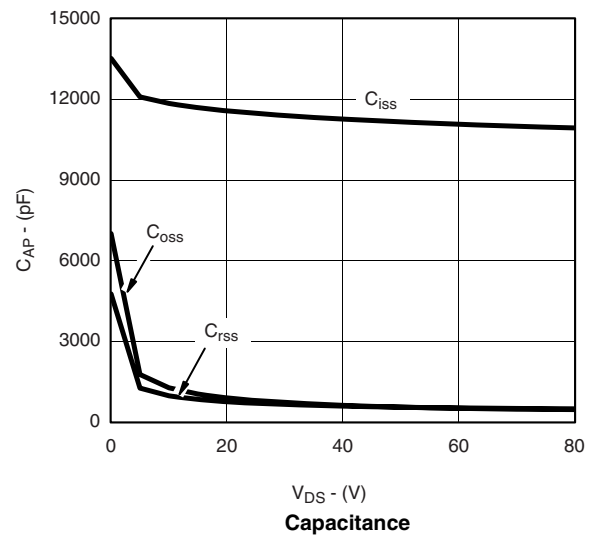
Output Characteristics



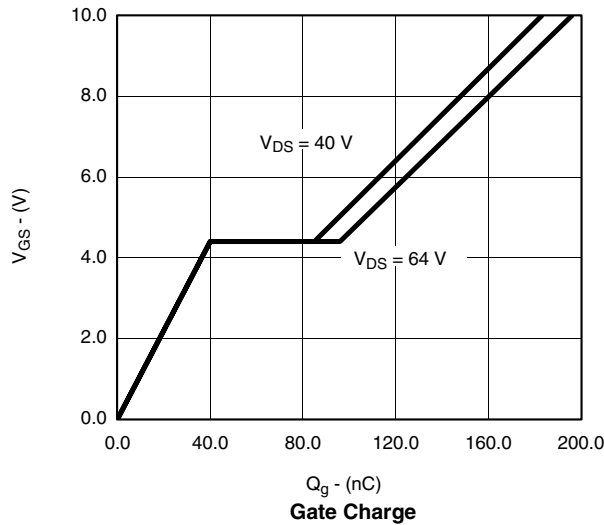
Transfer Characteristics



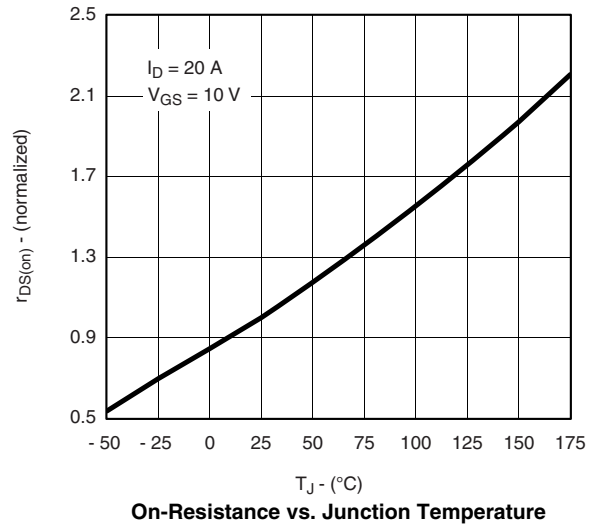
On-Resistance vs. Drain Current



Capacitance



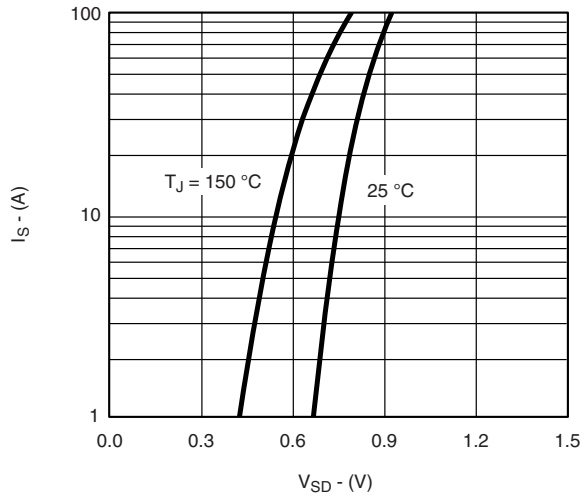
Gate Charge



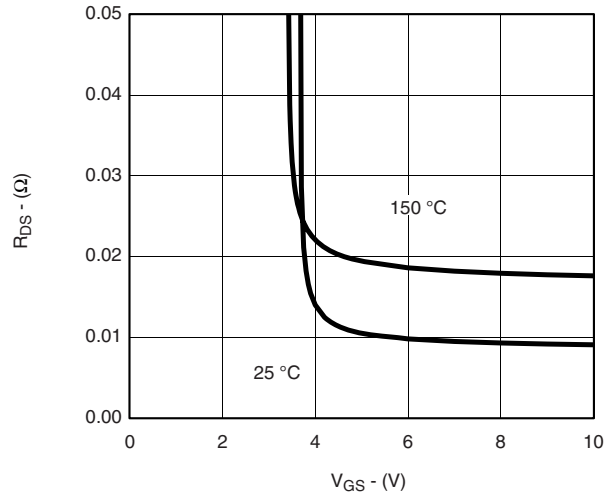
On-Resistance vs. Junction Temperature



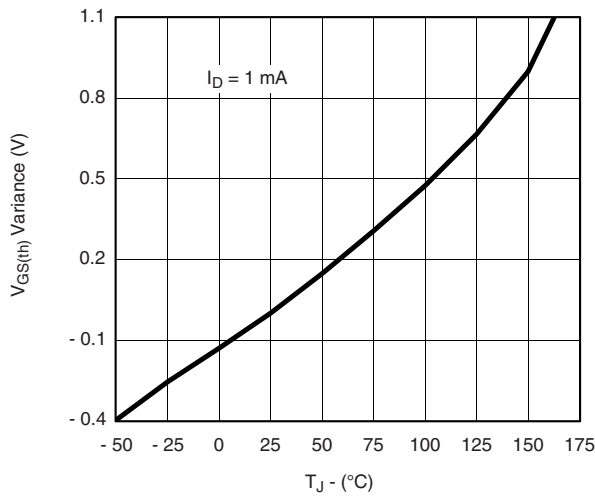
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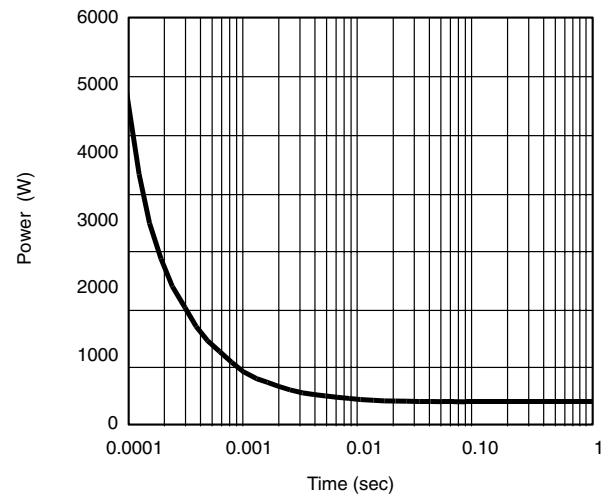
Source-Drain Diode Forward Voltage



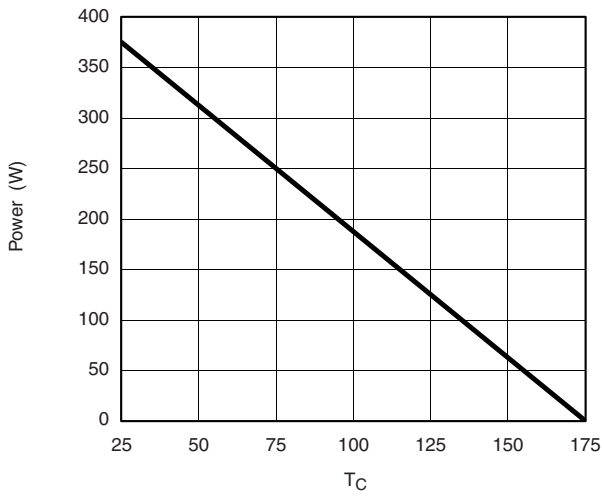
On-Resistance vs. Gate-to-Source Voltage



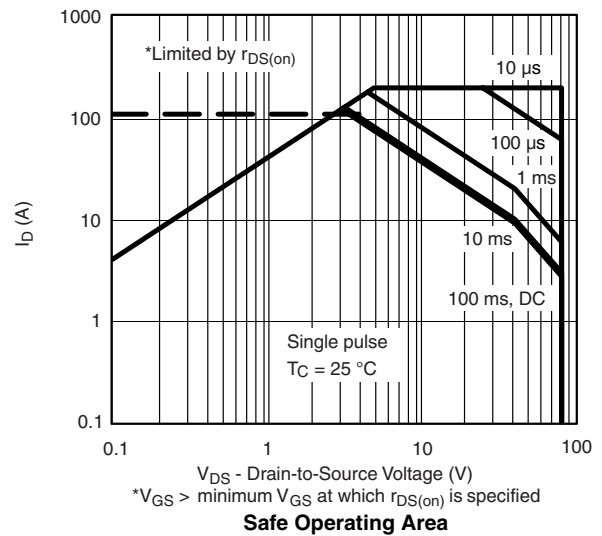
Threshold Voltage



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



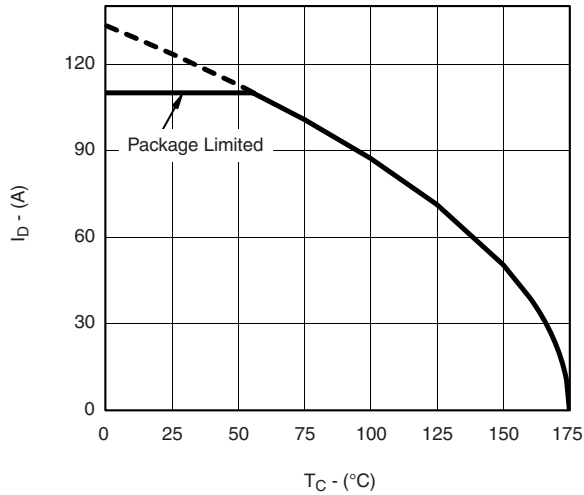
Power Derating (Junction-to-Case)



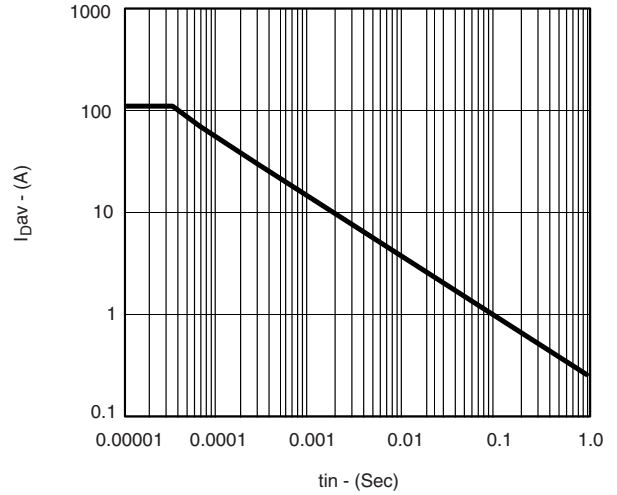
Safe Operating Area



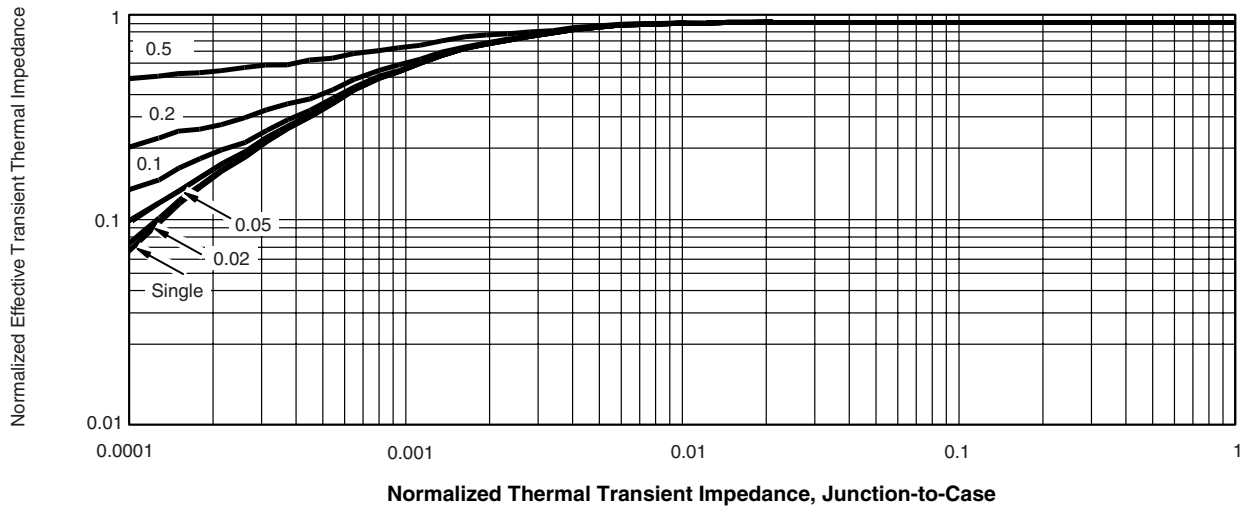
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



Max Avalanche and Drain Current vs. Case Temperature



Avalanche Current vs. Time



*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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