

P-Channel 80 V (D-S) MOSFET

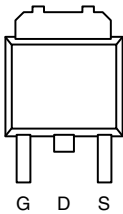
PRODUCT SUMMARY

V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A) ^b	Q_g (Typ)
- 80	0.0112 at $V_{GS} = - 10$ V	- 110	85 nC
	0.0145 at $V_{GS} = - 4.5$ V	- 109	

FEATURES

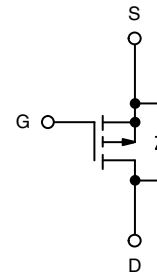
- TrenchFET[®] Power MOSFET
- Material categorization:
For definitions of compliance please see www.vishay.com/doc?99912


RoHS
COMPLIANT

TO-263


Top View

Drain Connected to Tab

Ordering Information: SUM110P08-11L-E3 (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 ($T_J = 175$ °C)	I_D	$T_C = 25$ °C	- 110 ^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	A	
Continuous Source-Drain Diode Current	I_S	$T_C = 25$ °C		- 110
		$T_A = 25$ °C		- 9 ^{b, c}
Avalanche Current	I_{AS}	- 75	mJ	
Single-Pulse Avalanche Energy	E_{AS}	281		
Maximum Power Dissipation	P_D	$T_C = 25$ °C	375	
		$T_C = 125$ °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:

a. Package limited.

b. Surface mounted on 1" x 1" FR4 board.

 c. $t = 10$ s.

d. Maximum under steady state conditions is 40 °C/W.

SPECIFICATIONS ($T_A = 25\text{ }^\circ\text{C}$, 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	$\Delta V_{DS}/T_J$	$I_D = -1\text{ }\mu\text{A}$		- 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}	$V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$			± 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	$R_{DS(on)}$	$V_{GS} = -10\text{ V}, I_D = -20\text{ A}$		0.0093	0.0112	Ω
		$V_{GS} = -4.5\text{ V}, I_D = -15\text{ A}$		0.0120	0.0145	
Forward Transconductance ^a	g_{fs}	$V_{DS} = -15\text{ V}, I_D = -20\text{ A}$		85		S
Dynamic^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		Ω
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = -40\text{ V}, R_L = 0.36\text{ }\Omega$ $I_D \approx -110\text{ A}, V_{GEN} = -10\text{ V}, R_g = 1\text{ }\Omega$		20	30	ns
Rise Time	t_r			330	500	
Turn-Off Delay Time	$t_{d(off)}$			135	205	
Fall Time	t_f			550	825	
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		

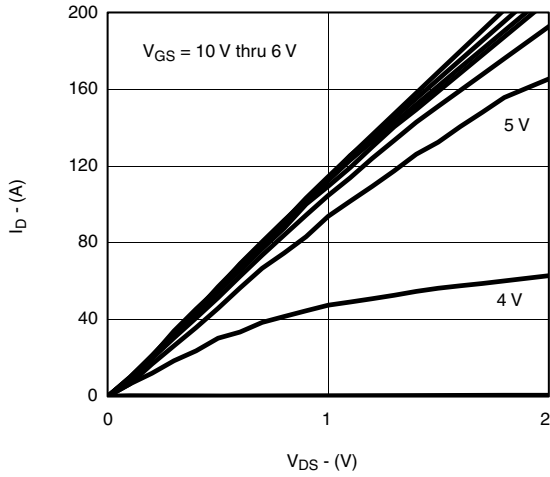
Notes:

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

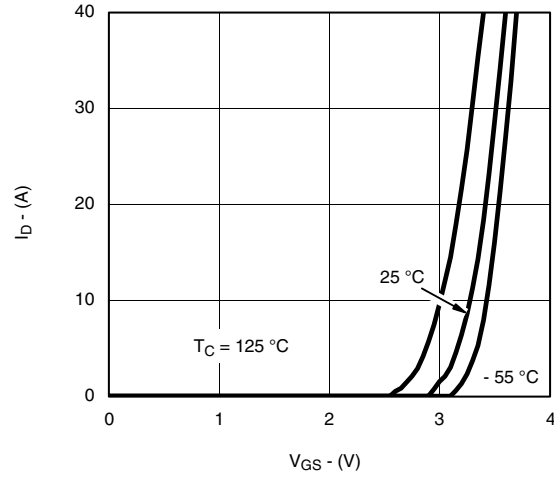
Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure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



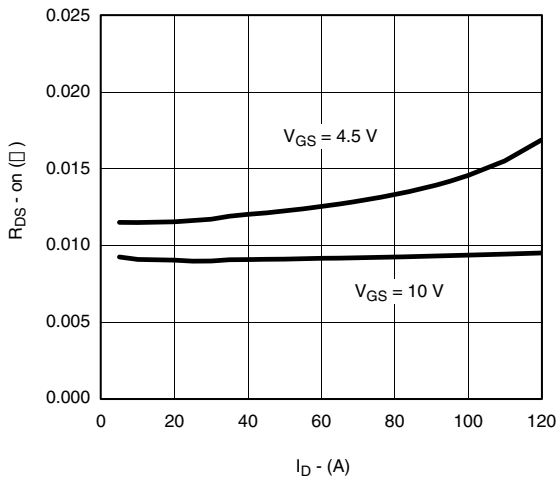
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



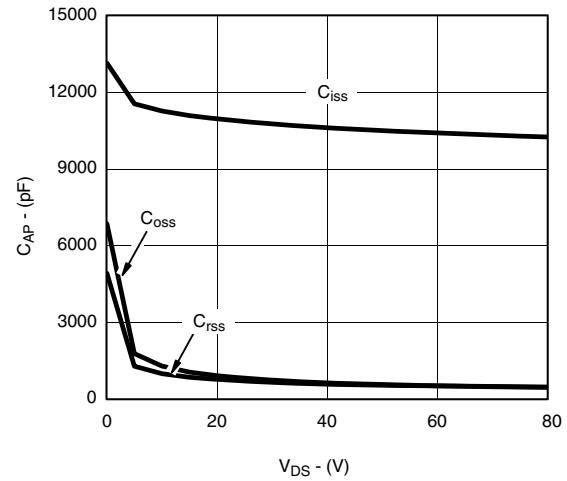
Output Characteristics



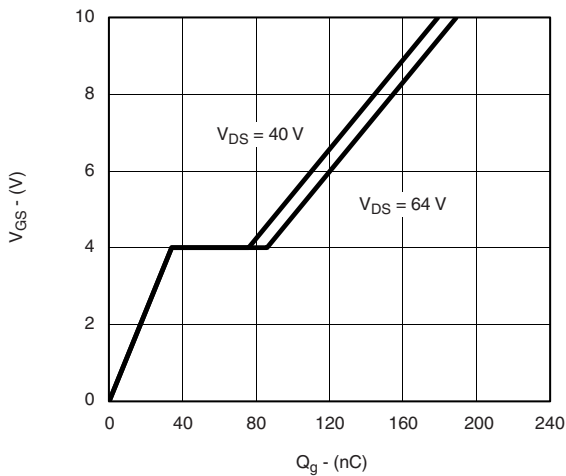
Transfer Characteristics



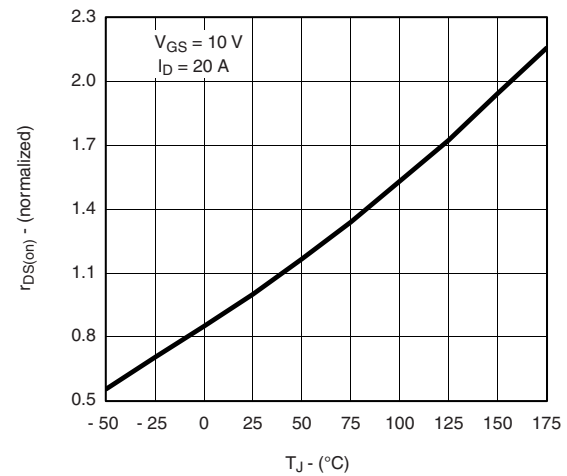
On-Resistance vs. Drain Current



Capacitance



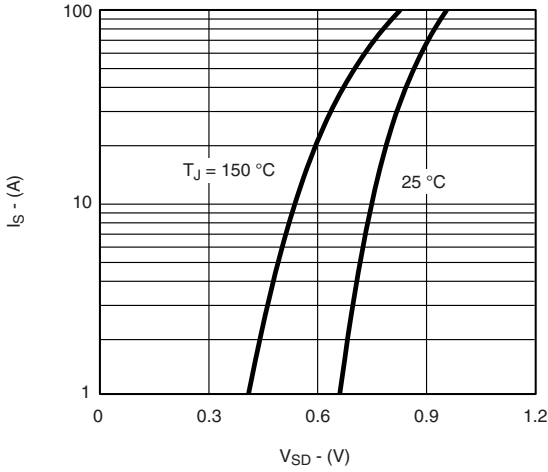
Gate Charge



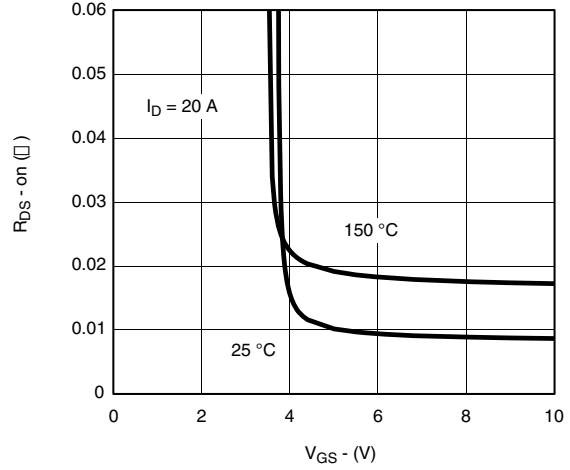
On-Resistance vs. Junction Temperature



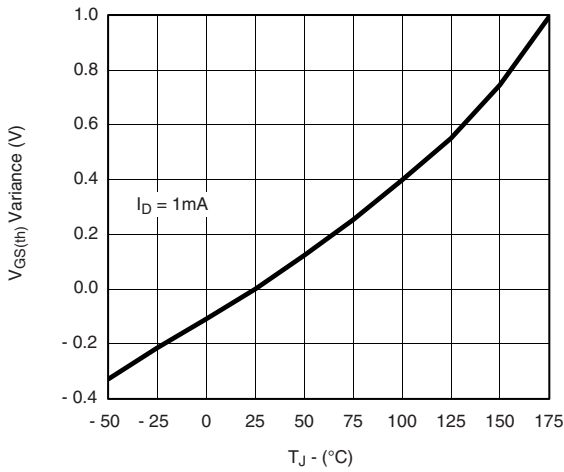
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



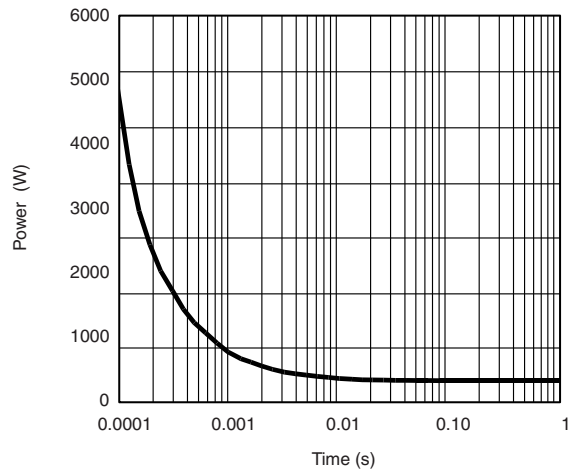
Source-Drain Diode Forward Voltage



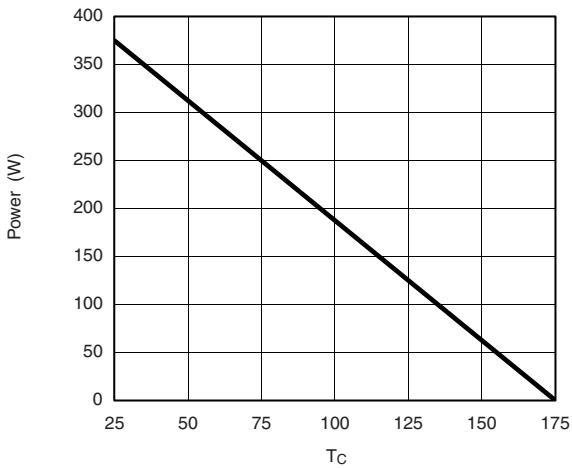
On-Resistance vs. Gate-to-Source Voltage



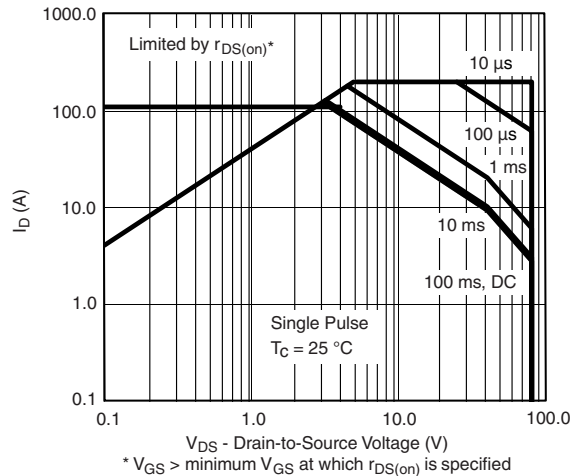
Threshold Voltage



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



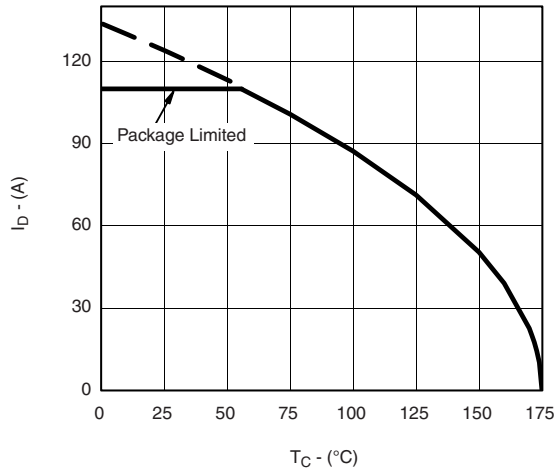
Power Derating, Junction-to-Case



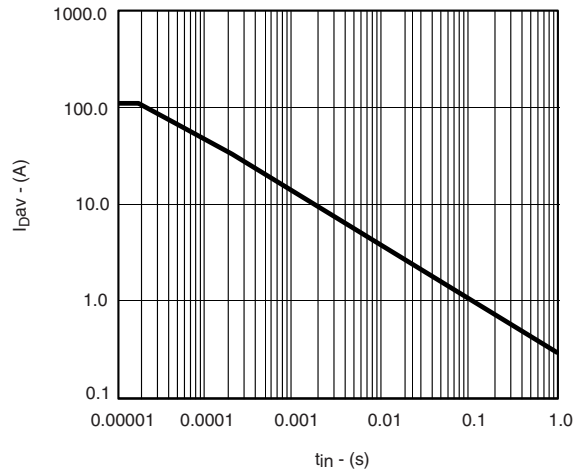
Safe Operating Area



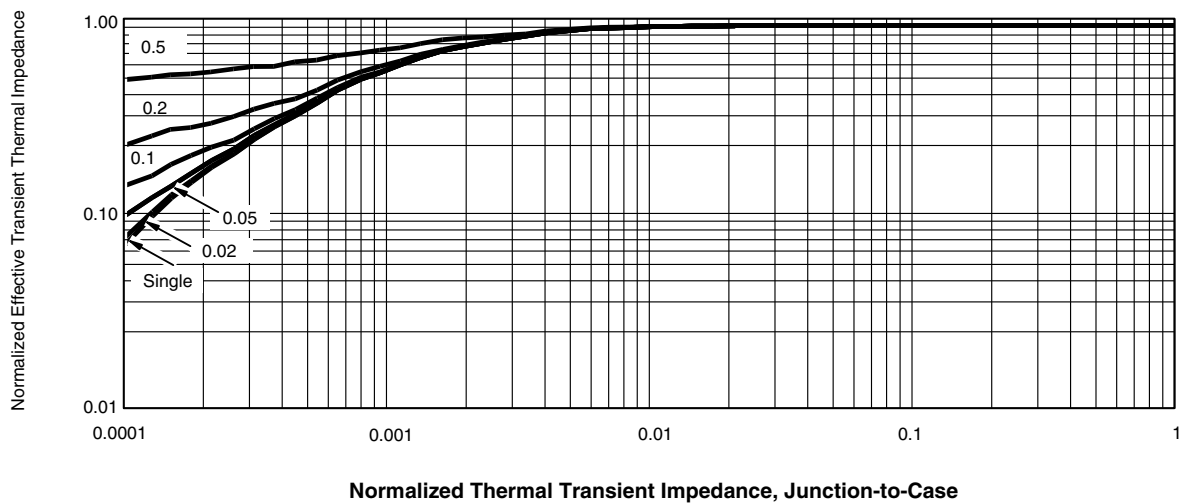
TYPICAL CHARACTERISTICS (25 °C, unless otherwise noted)



Max. Avalanche and Drain Current vs. Case Temperature



Avalanche Current vs. Time



Normalized Thermal Transient Impedance, Junction-to-Case

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TO-263 (D²PAK): 3-LEAD



DIM.	INCHES		MILLIMETERS		
	MIN.	MAX.	MIN.	MAX.	
A	0.160	0.190	4.064	4.826	
b	0.020	0.039	0.508	0.990	
b1	0.020	0.035	0.508	0.889	
b2	0.045	0.055	1.143	1.397	
c*	Thin lead	0.013	0.018	0.330	0.457
	Thick lead	0.023	0.028	0.584	0.711
c1	Thin lead	0.013	0.017	0.330	0.431
	Thick lead	0.023	0.027	0.584	0.685
c2	0.045	0.055	1.143	1.397	
D	0.340	0.380	8.636	9.652	
D1	0.220	0.240	5.588	6.096	
D2	0.038	0.042	0.965	1.067	
D3	0.045	0.055	1.143	1.397	
D4	0.044	0.052	1.118	1.321	
E	0.380	0.410	9.652	10.414	
E1	0.245	-	6.223	-	
E2	0.355	0.375	9.017	9.525	
E3	0.072	0.078	1.829	1.981	
e	0.100 BSC		2.54 BSC		
K	0.045	0.055	1.143	1.397	
L	0.575	0.625	14.605	15.875	
L1	0.090	0.110	2.286	2.794	
L2	0.040	0.055	1.016	1.397	
L3	0.050	0.070	1.270	1.778	
L4	0.010 BSC		0.254 BSC		
M	-	0.002	-	0.050	
ECN: T13-0707-Rev. K, 30-Sep-13					
DWG: 5843					

Notes

- Plane B includes maximum features of heat sink tab and plastic.
- No more than 25 % of L1 can fall above seating plane by max. 8 mils.
- Pin-to-pin coplanarity max. 4 mils.
- *: Thin lead is for SUB, SYB.
Thick lead is for SUM, SYM, SQM.
- Use inches as the primary measurement.
- This feature is for thick lead.

RECOMMENDED MINIMUM PADS FOR D²PAK: 3-Lead



Recommended Minimum Pads
Dimensions in Inches/(mm)

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