



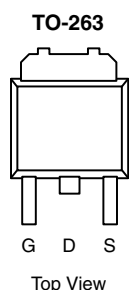
## P-Channel 80-V (D-S) MOSFET

## PRODUCT SUMMARY

$V_{DS}$ (V)	$r_{DS(on)}$ ( $\Omega$ )	$I_D$ (A) <sup>b</sup>	$Q_g$ (Typ)
- 80	0.0111 at $V_{GS} = - 10$ V	- 110	113 nC

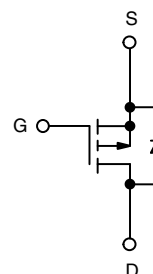
## FEATURES

- TrenchFET<sup>®</sup> Power MOSFET

RoHS  
COMPLIANT

Drain Connected to Tab

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



P-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS  $T_A = 25\text{ }^\circ\text{C}$ , unless otherwise noted

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	$V_{DS}$	- 80	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	
Continuous Drain Current ( $T_J = 150\text{ }^\circ\text{C}$ )	$T_C = 25\text{ }^\circ\text{C}$	$I_D$	110 <sup>a</sup>
	$T_C = 125\text{ }^\circ\text{C}$		71
	$T_A = 25\text{ }^\circ\text{C}$		23.5 <sup>b, c</sup>
	$T_A = 125\text{ }^\circ\text{C}$		13.6 <sup>b, c</sup>
Pulsed Drain Current	$I_{DM}$	- 120	A
Continuous Source-Drain Diode Current	$T_C = 25\text{ }^\circ\text{C}$	$I_S$	110 <sup>a</sup>
	$T_A = 25\text{ }^\circ\text{C}$		- 9 <sup>b, c</sup>
Avalanche Current	$L = 0.1\text{ mH}$	$I_{AS}$	- 75
Single-Pulse Avalanche Energy		$E_{AS}$	281
Maximum Power Dissipation	$T_C = 25\text{ }^\circ\text{C}$	$P_D$	375
	$T_C = 125\text{ }^\circ\text{C}$		125
	$T_A = 25\text{ }^\circ\text{C}$		13.6 <sup>b, c</sup>
	$T_A = 125\text{ }^\circ\text{C}$		4.5 <sup>b, c</sup>
Operating Junction and Storage Temperature Range	$T_J, T_{stg}$	- 55 to 175	$^\circ\text{C}$

## THERMAL RESISTANCE RATINGS

Parameter	Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient <sup>b, d</sup>	$R_{thJA}$	8	11	$^\circ\text{C/W}$
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.  $t = 10$  sec.d. Maximum under Steady State conditions is  $^\circ\text{C/W}$ .



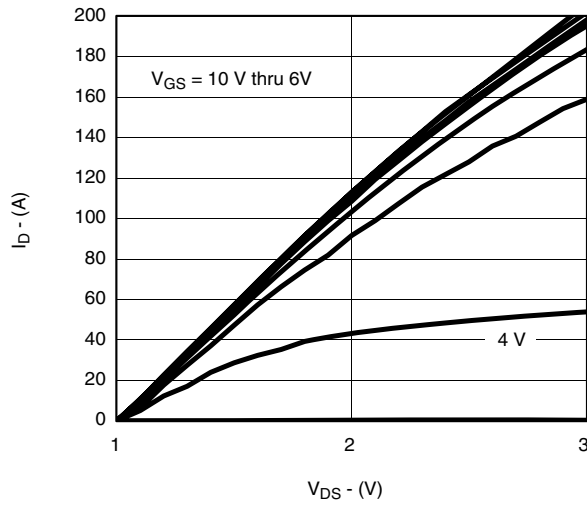
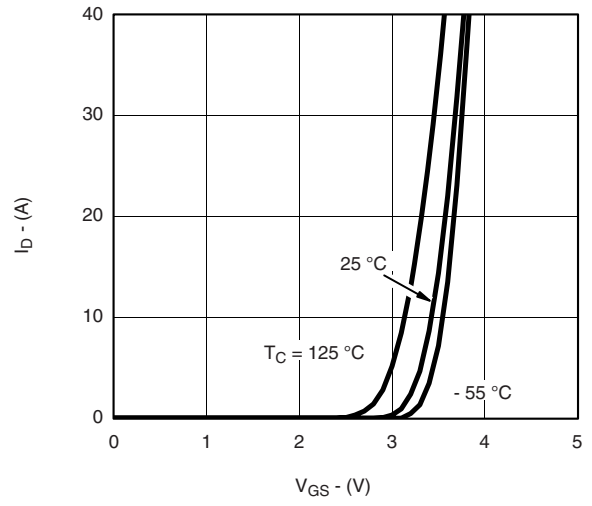
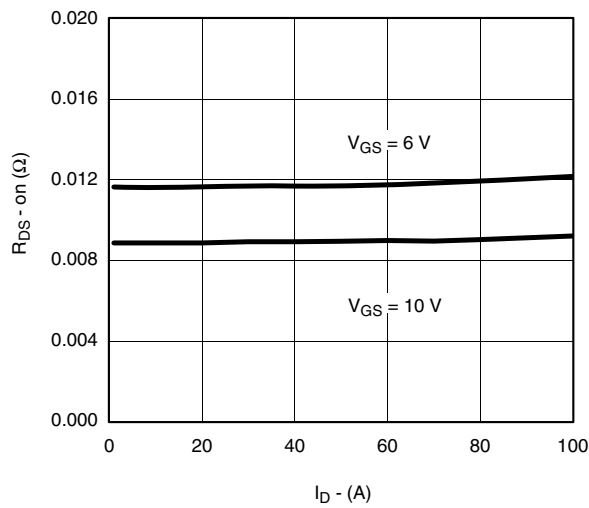
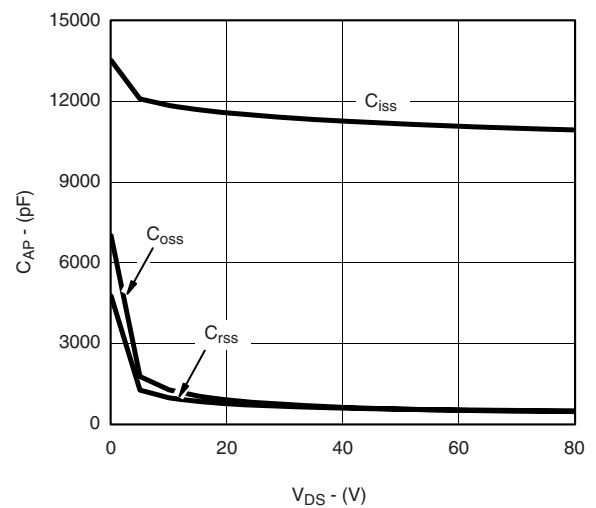
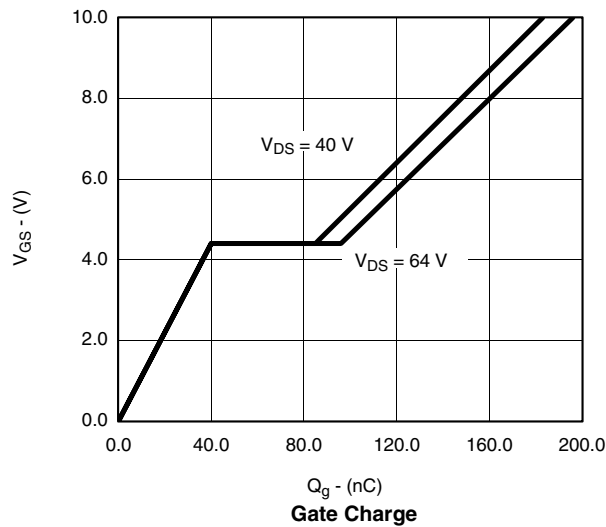
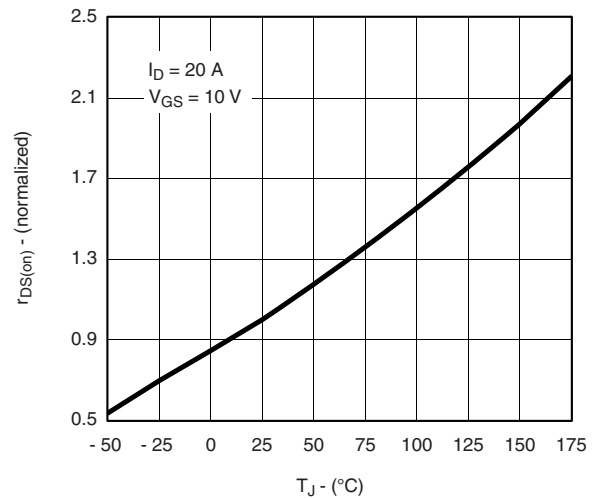
SPECIFICATIONS T <sub>J</sub> = 25 °C, unless otherwise noted						
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	V <sub>DS</sub>	V <sub>GS</sub> = 0 V, I <sub>D</sub> = - 250 μA	- 80			V
V <sub>DS</sub> Temperature Coefficient	ΔV <sub>DS</sub> /T <sub>J</sub>	I <sub>D</sub> = - 250 μA		- 85		mV/°C
V <sub>GS(th)</sub> Temperature Coefficient	ΔV <sub>GS(th)</sub> /T <sub>J</sub>			7.0		
Gate-Source Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = - 250 μA	- 2		- 4	V
Gate-Source Leakage	I <sub>GSS</sub>	V <sub>DS</sub> = 0 V, V <sub>GS</sub> = ± 20 V			± 100	nA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = - 80 V, V <sub>GS</sub> = 0 V			- 1	μA
		V <sub>DS</sub> = - 80 V, V <sub>GS</sub> = 0 V, T <sub>J</sub> = 175 °C			- 500	
On-State Drain Current <sup>a</sup>	I <sub>D(on)</sub>	V <sub>DS</sub> ≥ 10 V, V <sub>GS</sub> = - 10 V	120			A
Drain-Source On-State Resistance <sup>a</sup>	r <sub>DS(on)</sub>	V <sub>GS</sub> = - 10 V, I <sub>D</sub> = - 20 A		0.092	0.0111	Ω
Forward Transconductance <sup>a</sup>	g <sub>fs</sub>	V <sub>DS</sub> = - 15 V, I <sub>D</sub> = - 20 A		80		S
Dynamic <sup>b</sup>						
Input Capacitance	C <sub>iss</sub>	V <sub>DS</sub> = - 40 V, V <sub>GS</sub> = 0 V, f = 1 MHz		11500		pF
Output Capacitance	C <sub>oss</sub>			790		
Reverse Transfer Capacitance	C <sub>rss</sub>			700		
Total Gate Charge	Q <sub>g</sub>	V <sub>DS</sub> = - 40 V, V <sub>GS</sub> = - 10 V, I <sub>D</sub> = - 110 A		185	280	nC
Gate-Source Charge	Q <sub>gs</sub>			40		
Gate-Drain Charge	Q <sub>gd</sub>			45		
Gate Resistance	R <sub>g</sub>	f = 1 MHz		3.6		Ω
Turn-On Delay Time	t <sub>d(on)</sub>	V <sub>DD</sub> = - 40 V, R <sub>L</sub> = 0.36 Ω I <sub>D</sub> ≅ - 110 A, V <sub>GEN</sub> = - 10 V, R <sub>g</sub> = 1 Ω		25	40	ns
Rise Time	t <sub>r</sub>			410	620	
Turn-Off Delay Time	t <sub>d(off)</sub>			145	220	
Fall Time	t <sub>f</sub>			470	710	
Drain-Source Body Diode Characteristics						
Continuous Source-Drain Diode Current	I <sub>S</sub>	T <sub>C</sub> = 25 °C			- 110	A
Pulse Diode Forward Current <sup>a</sup>	I <sub>SM</sub>				- 120	
Body Diode Voltage	V <sub>SD</sub>	I <sub>S</sub> = - 20 A		- 0.8	- 1.5	V
Body Diode Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> = - 20 A, di/dt = 100 A/μs, T <sub>J</sub> = 25 °C		65	100	ns
Body Diode Reverse Recovery Charge	Q <sub>rr</sub>			135	205	nC
Reverse Recovery Fall Time	t <sub>a</sub>			43		ns
Reverse Recovery Rise Time	t <sub>b</sub>			22		

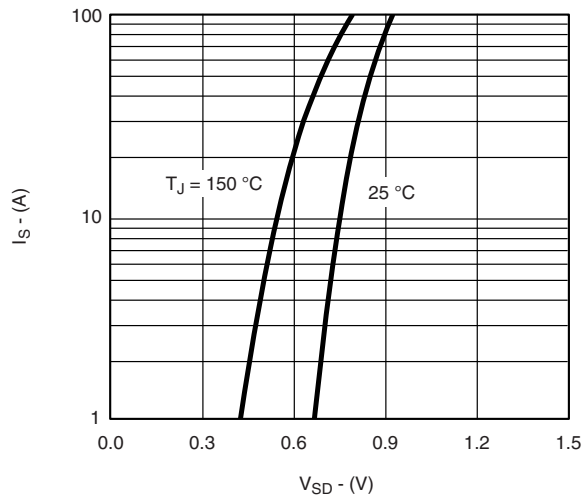
Notes:

a. Pulse test; pulse width  $\leq 300\text{ }\mu\text{s}$ , duty cycle  $\leq 2\%$ .

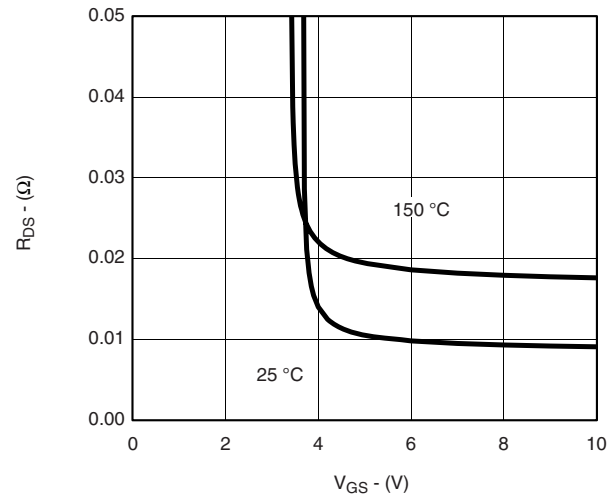
b. Guaranteed by design, not subject to production testing.

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.

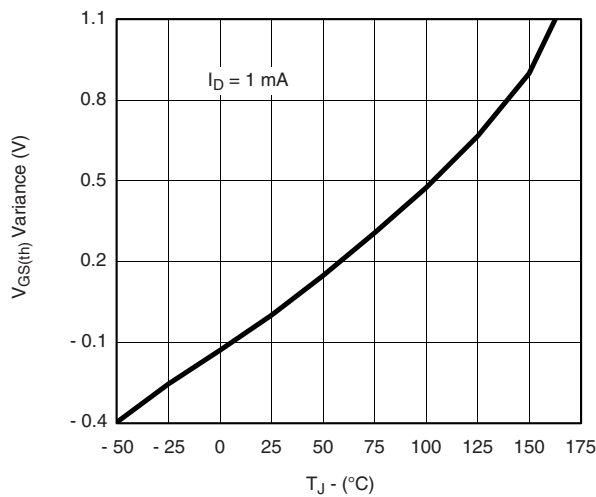
**TYPICAL CHARACTERISTICS** 25 °C, unless otherwise noted**Output Characteristics****Transfer Characteristics****On-Resistance vs. Drain Current****Capacitance****Gate Charge****On-Resistance vs. Junction Temperature**

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

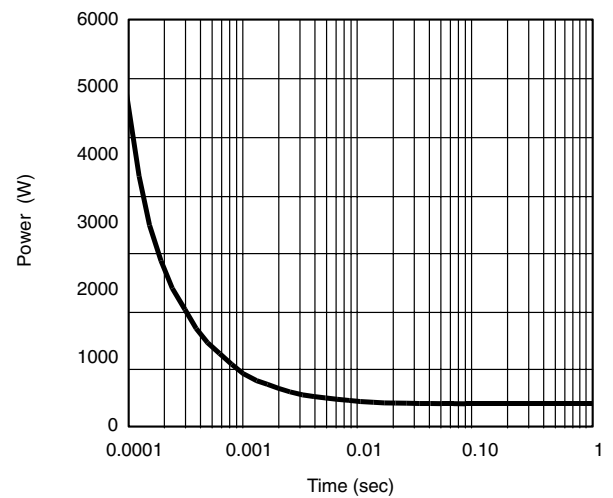
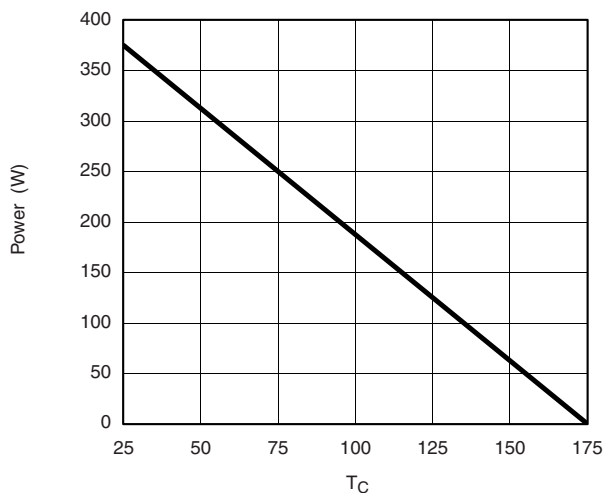
Source-Drain Diode Forward Voltage



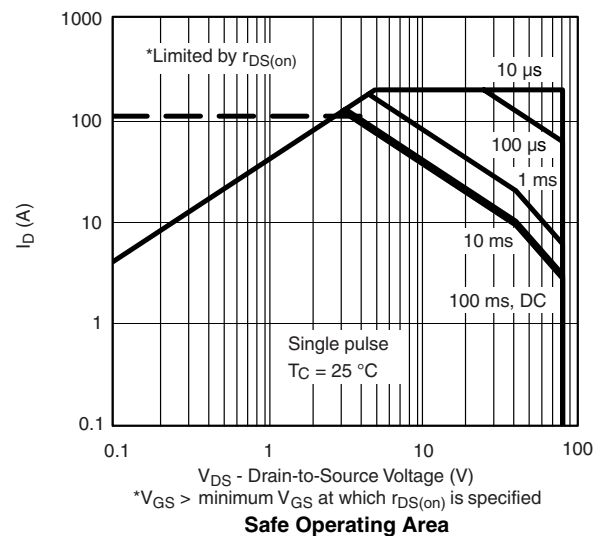
On-Resistance vs. Gate-to-Source Voltage



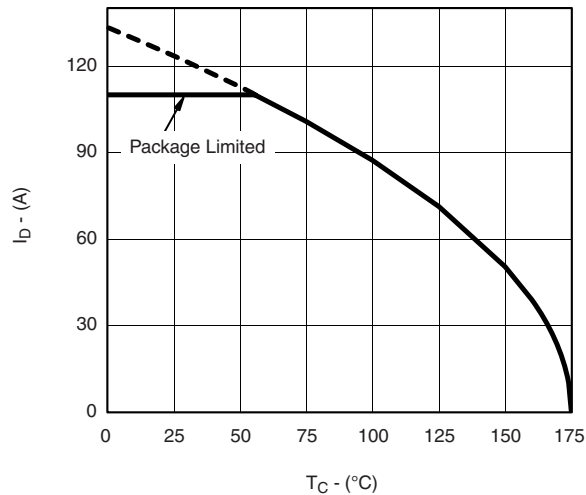
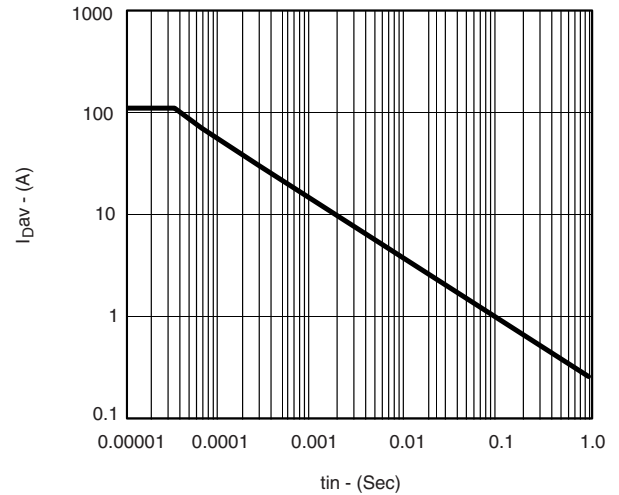
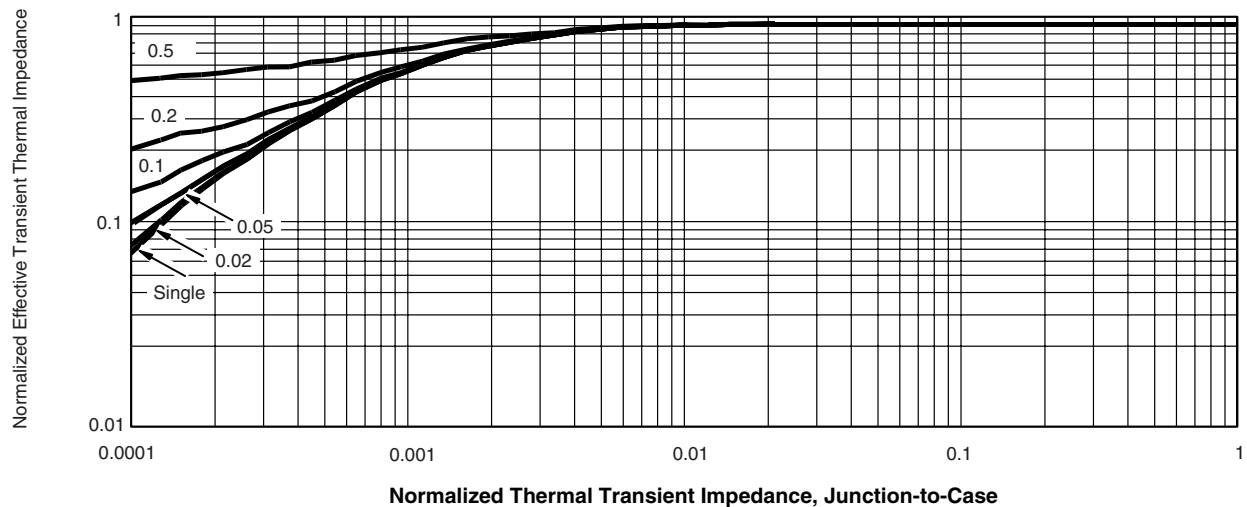
Threshold Voltage

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  $T_{J(max)} = 175$  °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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