



P-Channel 60-V (D-S) 175 °C MOSFET

PRODUCT SUMMARY		
V _{DS} (V)	r _{DS(on)} (Ω)	I _D (A) ^d
- 60	0.008 at V _{GS} = - 10 V	- 110
	0.0105 at V _{GS} = - 4.5 V	

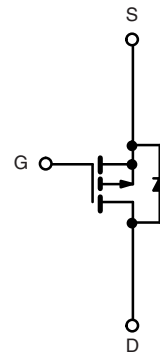
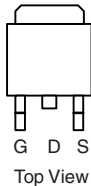
FEATURES

- TrenchFET[®] Power MOSFET
- Package with Low Thermal Resistance
- 100 % R_g Tested



RoHS* COMPLIANT

TO-263



P-Channel MOSFET

Ordering Information: SUM110P06-08L
 SUM110P06-08L-E3 (Lead (Pb)-free)

ABSOLUTE MAXIMUM RATINGS T _C = 25 °C, unless otherwise noted				
Parameter	Symbol	Limit	Unit	
Drain-Source Voltage	V _{DS}	- 60	V	
Gate-Source Voltage	V _{GS}	± 20		
Continuous Drain Current ^d (T _J = 175 °C)	I _D	T _C = 25 °C	- 110	A
		T _C = 125 °C	- 75	
Pulsed Drain Current	I _{DM}	- 200		
Avalanche Current	I _{AS}	- 85		
Single Pulse Avalanche Energy ^d	E _{AS}	211	mJ	
Maximum Power Dissipation	P _D	T _C = 25 °C	272 ^c	W
		T _A = 25 °C ^b	3.75 ^b	
Operating Junction and Storage Temperature Range	T _J , T _{stg}	- 55 to 175	°C	

THERMAL RESISTANCE RATINGS				
Parameter		Symbol	Limit	Unit
Junction-to-Ambient	PCB Mount ^d	R _{thJA}	40	°C/W
Junction-to-Case		R _{thJC}	0.55	

Notes:

- a. Duty cycle ≤ 1 %.
- b. When Mounted on 1" square PCB (FR-4 material).
- c. See SOA curve for voltage derating.
- d. Limited by Package.

* Pb containing terminations are not RoHS compliant, exemptions may apply.

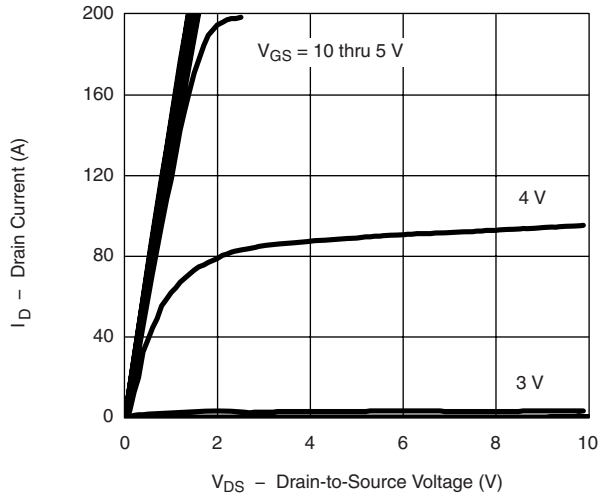
SPECIFICATIONS $T_J = 25\text{ }^\circ\text{C}$, unless otherwise noted							
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit	
Static							
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0\text{ V}, I_D = -250\text{ }\mu\text{A}$	- 60			V	
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\text{ }\mu\text{A}$	- 1		- 3		
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$			± 100	nA	
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -60\text{ V}, V_{GS} = 0\text{ V}$			- 1	μA	
		$V_{DS} = -60\text{ V}, V_{GS} = 0\text{ V}, T_J = 125\text{ }^\circ\text{C}$			- 50		
		$V_{DS} = -60\text{ V}, V_{GS} = 0\text{ V}, T_J = 175\text{ }^\circ\text{C}$			- 250		
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} = -5\text{ V}, V_{GS} = -10\text{ V}$	- 120			A	
Drain-Source On-State Resistance ^a	$r_{DS(on)}$	$V_{GS} = -10\text{ V}, I_D = -30\text{ A}$		0.0065	0.008	Ω	
		$V_{GS} = -10\text{ V}, I_D = -30\text{ A}, T_J = 125\text{ }^\circ\text{C}$			0.0129		
		$V_{GS} = -10\text{ V}, I_D = -30\text{ A}, T_J = 175\text{ }^\circ\text{C}$			0.016		
		$V_{GS} = -4.5\text{ V}, I_D = -20\text{ A}$		0.0085	0.0105		
Forward Transconductance ^a	g_{fs}	$V_{DS} = -15\text{ V}, I_D = -50\text{ A}$	20			S	
Dynamic^b							
Input Capacitance	C_{iss}	$V_{GS} = 0\text{ V}, V_{DS} = -25\text{ V}, f = 1\text{ MHz}$		9200		pF	
Output Capacitance	C_{oss}			975			
Reverse Transfer Capacitance	C_{rss}			760			
Total Gate Charge ^c	Q_g	$V_{DS} = -30\text{ V}, V_{GS} = -10\text{ V}, I_D = -110\text{ A}$		160	240	nC	
Gate-Source Charge ^c	Q_{gs}			40			
Gate-Drain Charge ^c	Q_{gd}			36			
Gate Resistance	R_g	$f = 1\text{ MHz}$	1.5	3	4.5	Ω	
Turn-On Delay Time ^c	$t_{d(on)}$	$V_{DD} = -30\text{ V}, R_L = 0.27\text{ }\Omega$ $I_D \cong -110\text{ A}, V_{GEN} = -10\text{ V}, R_G = 2.5\text{ }\Omega$		20	30	ns	
Rise Time ^c	t_r			190	285		
Turn-Off Delay Time ^c	$t_{d(off)}$			140	210		
Fall Time ^c	t_f			300	450		
Source-Drain Diode Ratings and Characteristics $T_C = 25\text{ }^\circ\text{C}^b$							
Continuous Current	I_S				- 110	A	
Pulsed Current	I_{SM}				- 200		
Forward Voltage ^a	V_{SD}	$I_F = -50\text{ A}, V_{GS} = 0\text{ V}$		- 1.0	- 1.5	V	
Reverse Recovery Time	t_{rr}	$I_F = -50\text{ A}, di/dt = 100\text{ A}/\mu\text{s}$		60	90	ns	
Peak Reverse Recovery Charge	$I_{RM(REC)}$				- 3	- 4.5	A
Reverse Recovery Charge	Q_{rr}				0.09	0.2	μC

Notes:

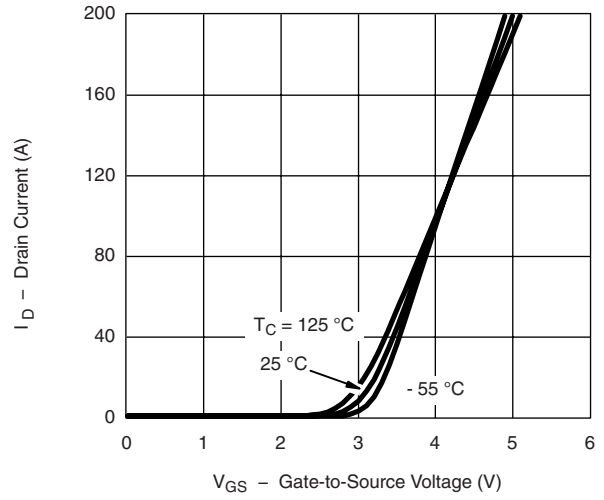
- Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.
- Guaranteed by design, not subject to production testing.
- Independent of operating temperature.

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.

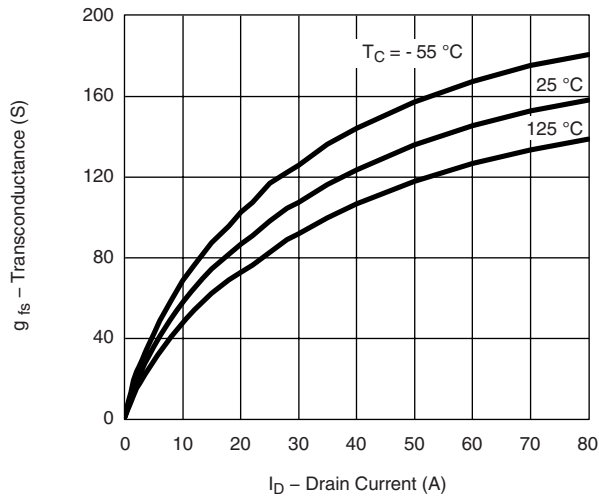
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



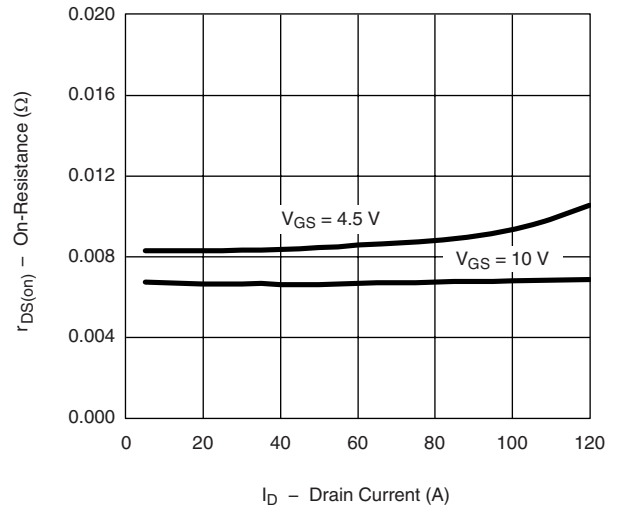
Output Characteristics



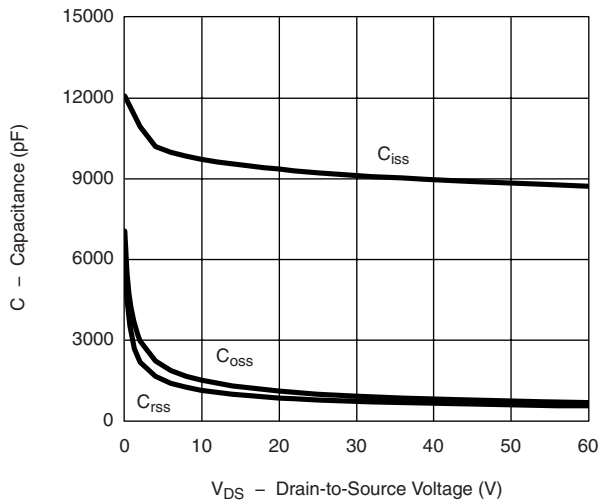
Transfer Characteristics



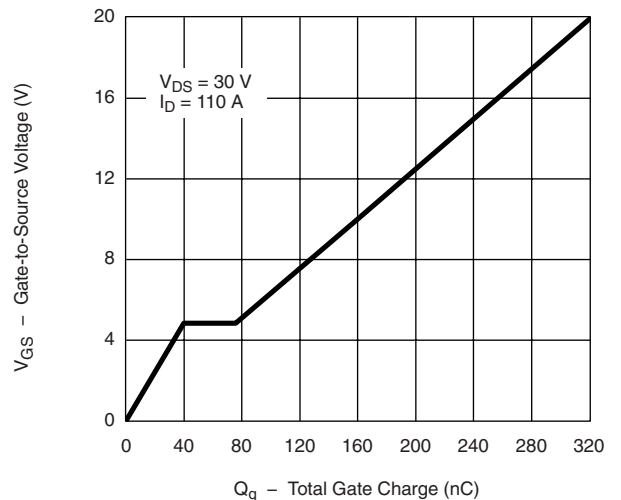
Transconductance



On-Resistance vs. Drain Current

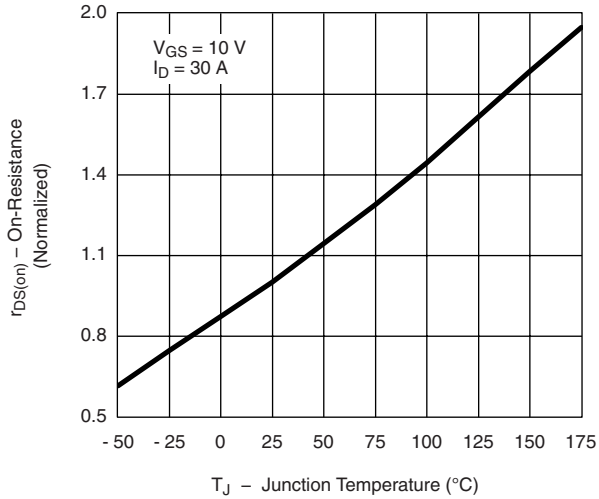


Capacitance

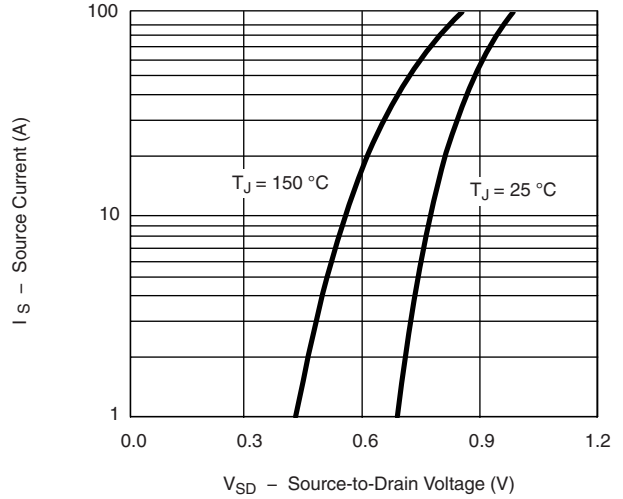


Gate Charge

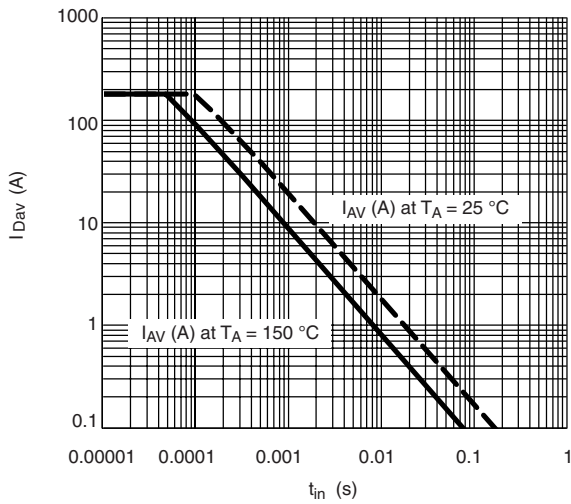
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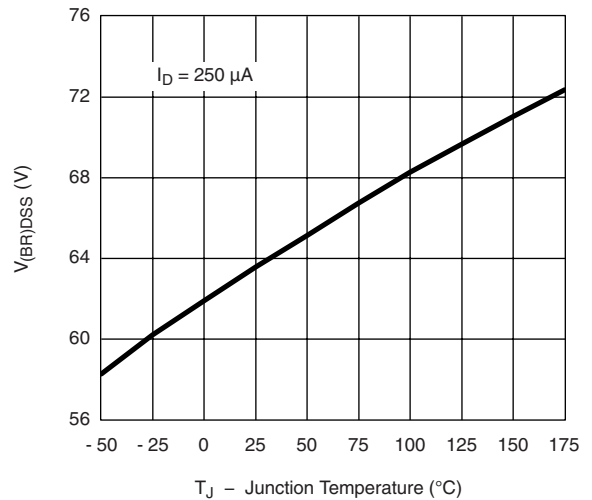
On-Resistance vs. Junction Temperature



Source-Drain Diode Forward Voltage

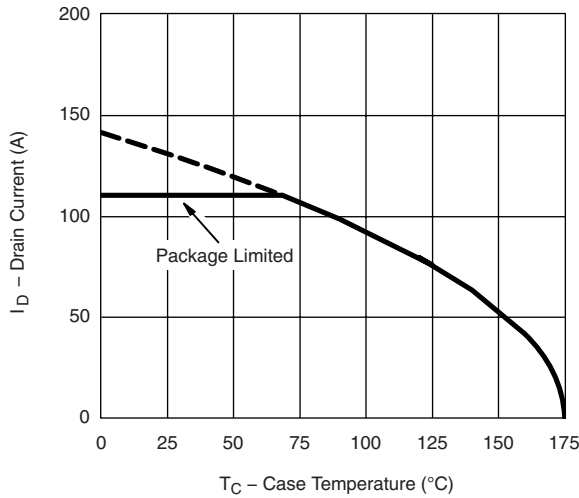


Avalanche Current vs. Time

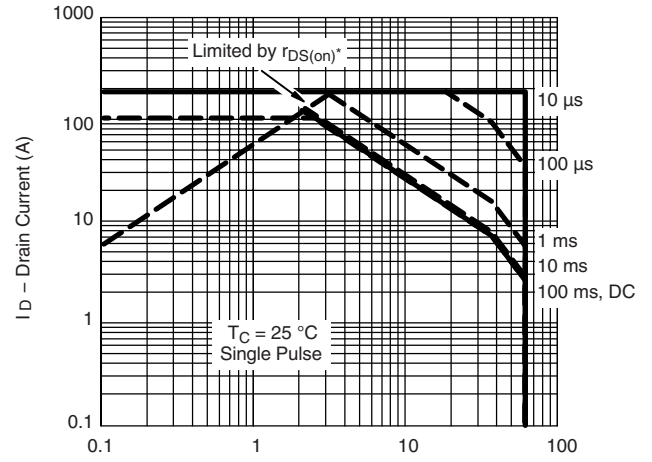


Drain Source Breakdown vs. Junction Temperature

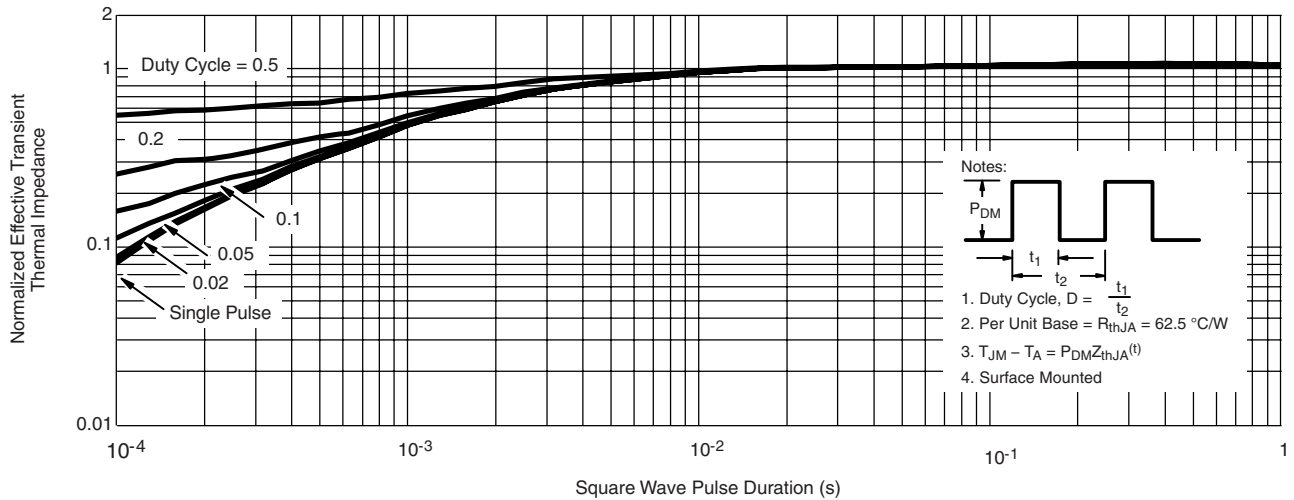
THERMAL RATINGS



Maximum Avalanche and Drain Current vs. Case Temperature



Safe Operating Area
 $V_{GS} >$ minimum V_{GS} at which $r_{DS(on)}$ is specified



Normalized Thermal Transient Impedance, Junction-to-Case

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