



P-Channel 60-V (D-S) 175°C MOSFET

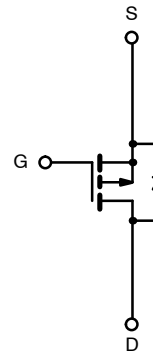
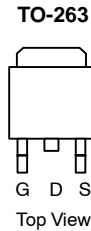
PRODUCT SUMMARY		
V _{DS} (V)	r _{DS(on)} (Ω)	I _D (A) ^d
-60	0.008 @ V _{GS} = -10 V	-110
	0.0105 @ V _{GS} = -4.5 V	-110

FEATURES

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

APPLICATIONS

- Automotive Such As
 - High-Side Switch
 - Motor Drives
 - 12-V Boardnet



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}	-65	mJ	
Single Pulse Avalanche Energy ^a	E _{AS}	211		
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 ^b	R _{thJA}	40	°C/W
Junction-to-Case	R _{thJC}	0.55	

Notes:

- Duty cycle ≤ 1%.
- When mounted on 1" square PCB (FR-4 material).
- See SOA curve for voltage derating.
- Limited by package.

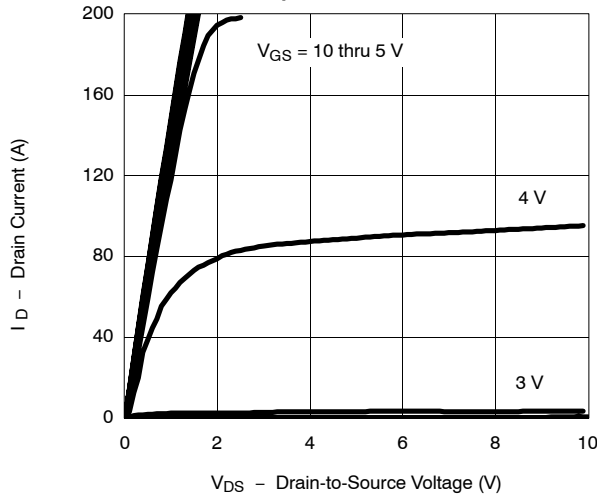
SPECIFICATIONS ($T_J = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0\text{ V}, I_D = -250\ \mu\text{A}$	-60			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = -250\ \mu\text{A}$	-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
		$V_{DS} = -60\text{ V}, V_{GS} = 0\text{ V}, T_J = 125^\circ\text{C}$			-50	
		$V_{DS} = -60\text{ V}, V_{GS} = 0\text{ V}, T_J = 175^\circ\text{C}$			-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
		$V_{GS} = -10\text{ V}, I_D = -30\text{ A}, T_J = 125^\circ\text{C}$			0.0129	
		$V_{GS} = -10\text{ V}, I_D = -30\text{ A}, T_J = 175^\circ\text{C}$			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	$f = 1.0\text{ MHz}$	1.5	3	4.5	Ω
Turn-On Delay Time ^c	$t_{d(on)}$	$V_{DD} = -30\text{ V}, R_L = 0.27\ \Omega$ $I_D \approx -110\text{ A}, V_{GEN} = -10\text{ V}, R_g = 2.5\ \Omega$		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 ($T_C = 25^\circ\text{C}$)^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 Current	$I_{RM(REC)}$			-3	-4.5	A
Reverse Recovery Charge	Q_{rr}			0.09	0.2	μC

Notes:

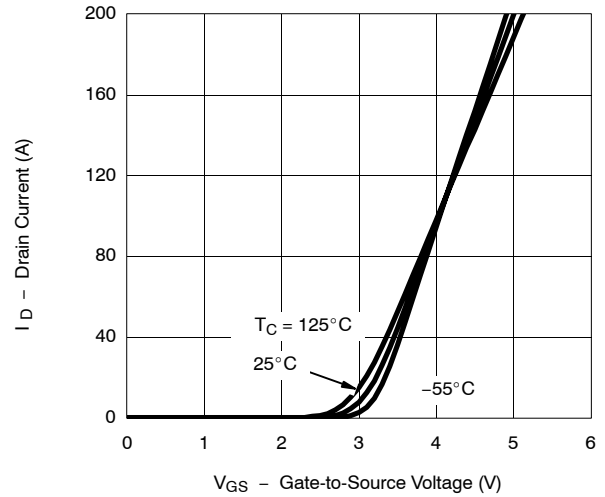
- Pulse test; pulse width $\leq 300\ \mu\text{s}$, duty cycle $\leq 2\%$.
- Guaranteed by design, not subject to production testing.
- Independent of operating temperature.

TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

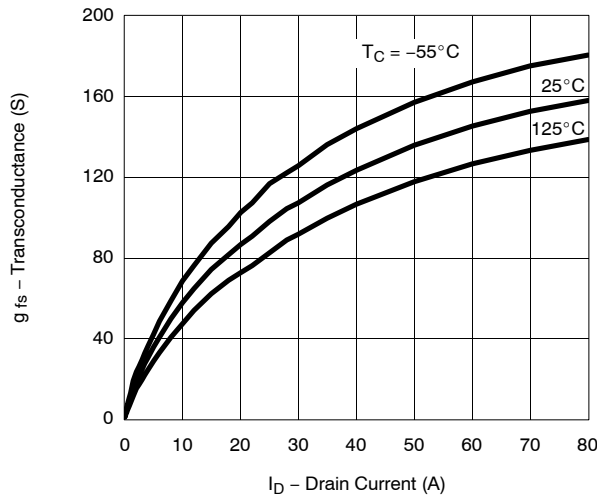
Output Characteristics



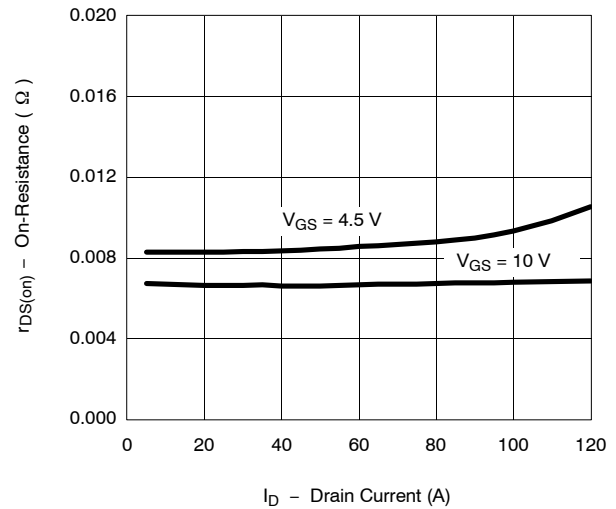
Transfer Characteristics



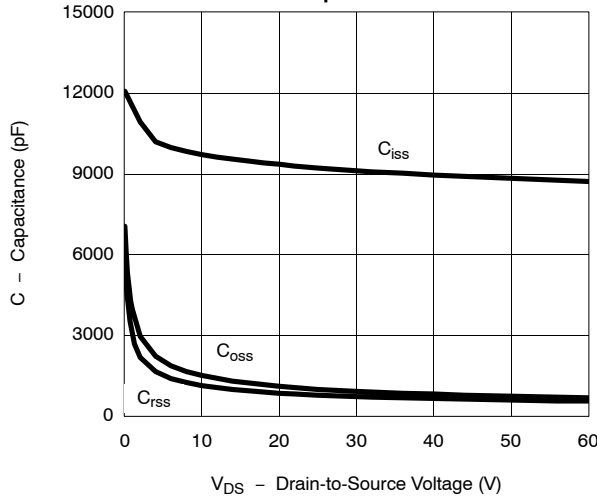
Transconductance



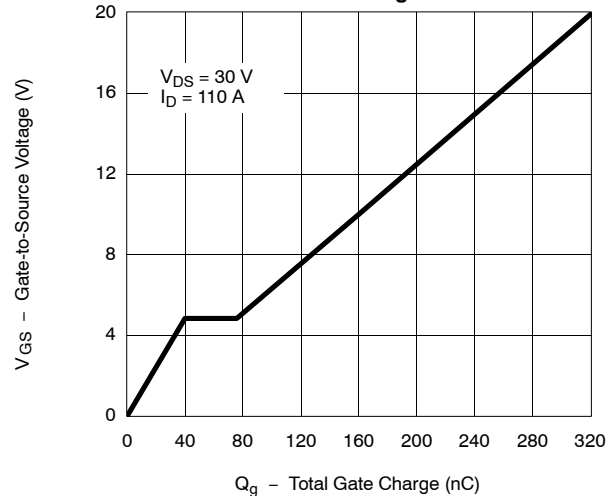
On-Resistance vs. Drain Current



Capacitance

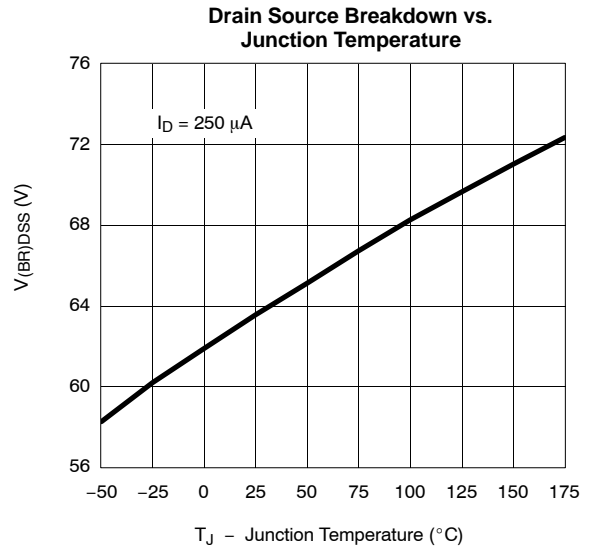
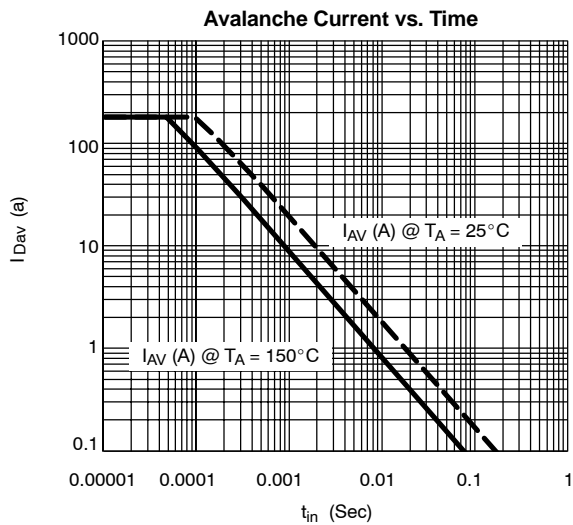
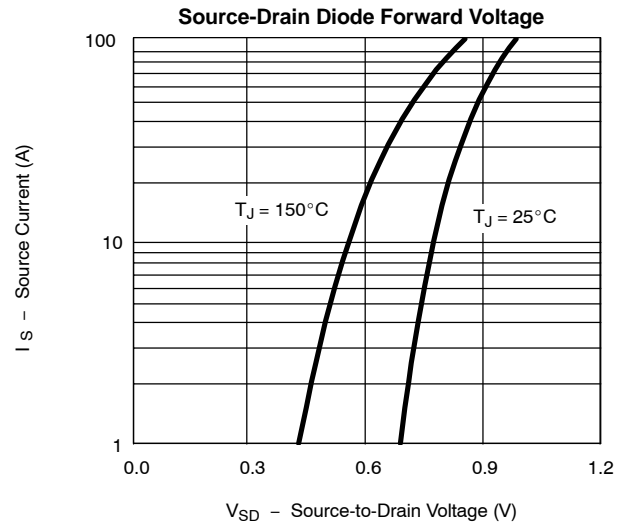
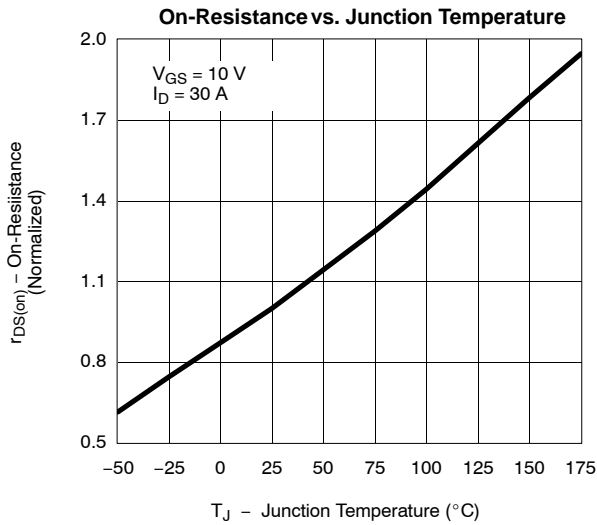


Gate Charge





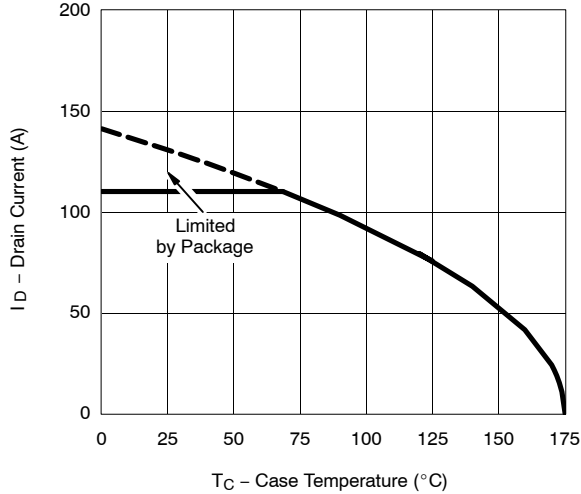
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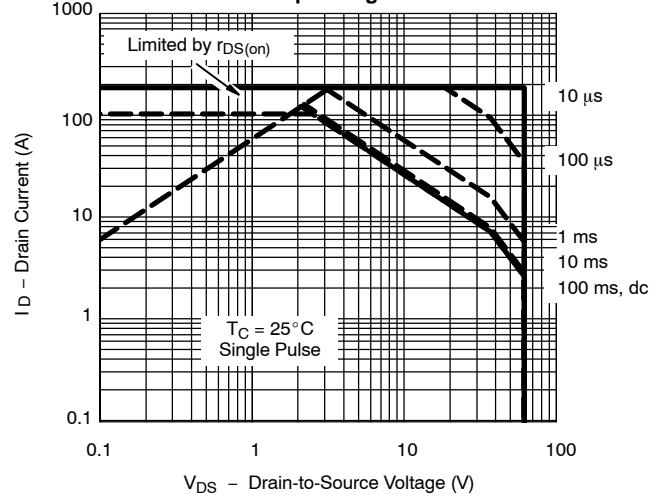


THERMAL RATINGS

Maximum Drain Current vs. Case Temperature



Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Case

