



P-Channel 60-V (D-S) 175°C MOSFET

PRODUCT SUMMARY			
V _{DS} (V)	r _{DS(on)} (Ω)	I _D (A) ^d	Q _g (Typ)
-60	0.019 @ V _{GS} = -10 V	-55	76
	0.025 @ V _{GS} = -4.5 V	-48	

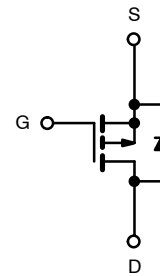
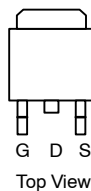
FEATURES

- TrenchFET® Power MOSFET

APPLICATIONS

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

TO-263



P-Channel MOSFET

Ordering Information: SUM55P06-19L
SUM55P06-19L—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	-55
		T _C = 125°C	-31
Pulsed Drain Current	I _{DM}	-150	A
Avalanche Current	I _{AS}	-45	mJ
Single Pulse Avalanche Energy ^a	E _{AS}	101	
Power Dissipation	P _D	T _C = 25°C	125°
		T _A = 25°C ^b	3.75
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}	1.2	

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.

SPECIFICATIONS (T _J = 25 °C UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} = 0 V, I _D = -250 μA	-60			V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = -250 μA	-1		-3	
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ±20 V			±100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = -60 V, V _{GS} = 0 V			-1	μA
		V _{DS} = -60 V, V _{GS} = 0 V, T _J = 125 °C			-50	
		V _{DS} = -60 V, V _{GS} = 0 V, T _J = 175 °C			-250	
On-State Drain Current ^a	I _{D(on)}	V _{DS} = -5 V, V _{GS} = -10 V	-120			A
Drain-Source On-State Resistance ^a	r _{DS(on)}	V _{GS} = -10 V, I _D = -30 A		0.015	0.019	Ω
		V _{GS} = -10 V, I _D = -30 A, T _J = 125 °C			0.033	
		V _{GS} = -10 V, I _D = -30 A, T _J = 175 °C			0.041	
		V _{GS} = -4.5 V, I _D = -20 A		0.020	0.025	
Forward Transconductance ^a	g _{fs}	V _{DS} = -15 V, I _D = -50 A	20			S
Dynamic^b						
Input Capacitance	C _{iss}	V _{GS} = 0 V, V _{DS} = -25 V, f = 1 MHz		3500		pF
Output Capacitance	C _{oss}			390		
Reverse Transfer Capacitance	C _{rss}			290		
Total Gate Charge ^c	Q _g	V _{DS} = -30 V, V _{GS} = -10 V, I _D = -55 A		76	115	nC
Gate-Source Charge ^c	Q _{gs}			16		
Gate-Drain Charge ^c	Q _{gd}			19		
Gate Resistance	R _g	f = 1.0 MHz		5.2		Ω
Turn-On Delay Time ^c	t _{d(on)}	V _{DD} = -30 V, R _L = 0.54 Ω I _D = -55 A, V _{GEN} = -10 V, R _g = 2.5 Ω		12	20	ns
Rise Time ^c	t _r			15	25	
Turn-Off Delay Time ^c	t _{d(off)}			80	120	
Fall Time ^c	t _f			230	350	
Source-Drain Diode Ratings and Characteristics (T_C = 25 °C)^b						
Continuous Current	I _s				-110	A
Pulsed Current	I _{SM}				-240	
Forward Voltage ^a	V _{SD}	I _F = -50 A, V _{GS} = 0 V		-1.0	-1.5	V
Reverse Recovery Time	t _{rr}	I _F = -50 A, di/dt = 100 A/μs		45	68	ns
Peak Reverse Recovery Current	I _{RM(REC)}			-2.6	4.0	A
Reverse Recovery Charge	Q _{rr}				0.059	0.136

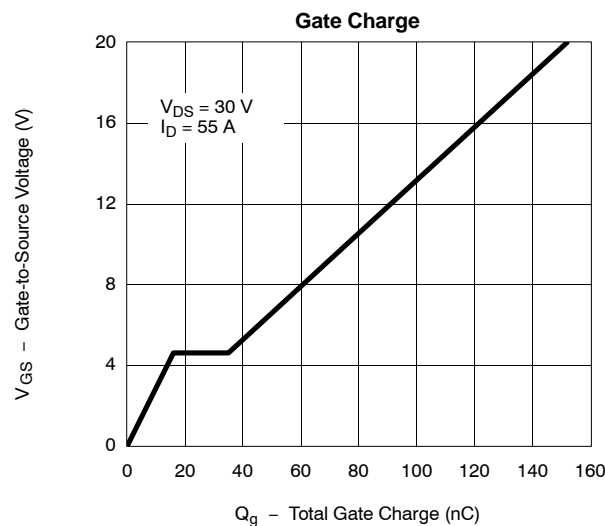
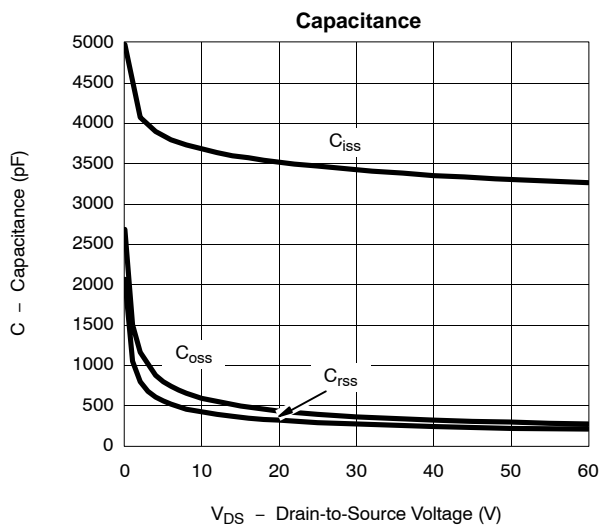
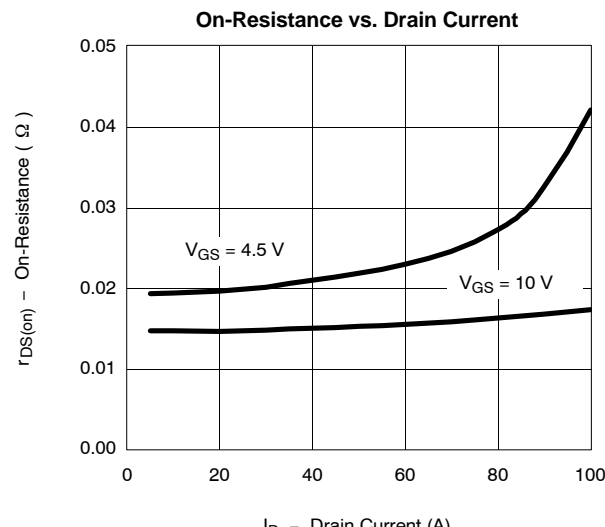
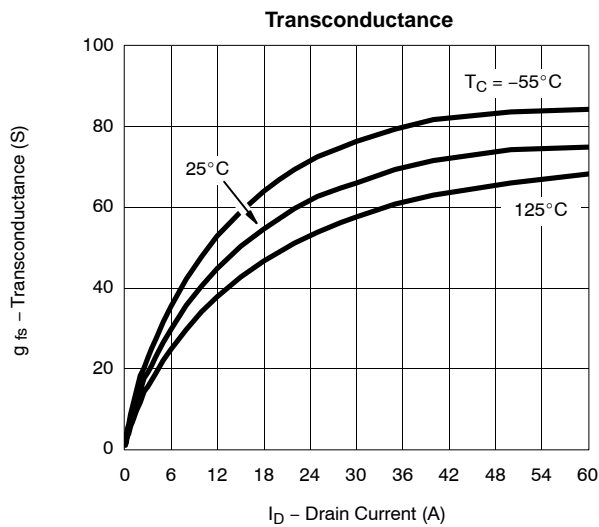
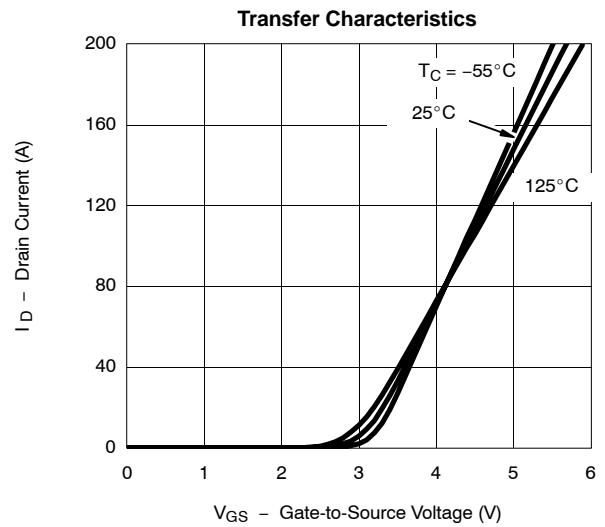
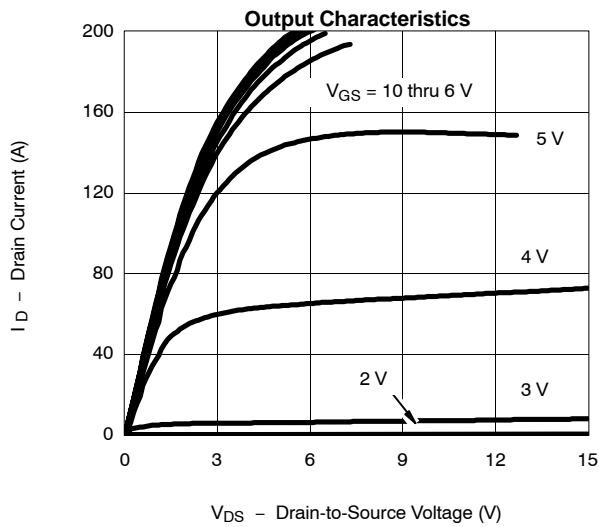
Notes:

- Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 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.

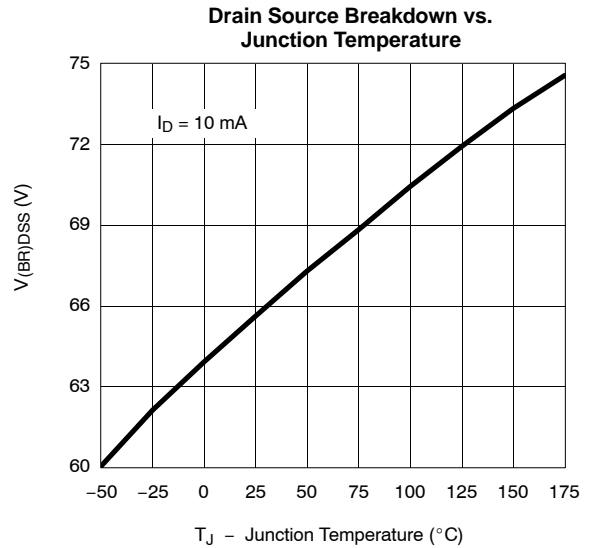
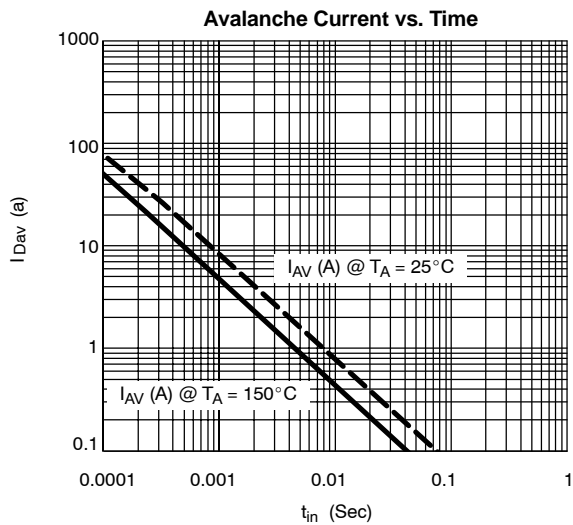
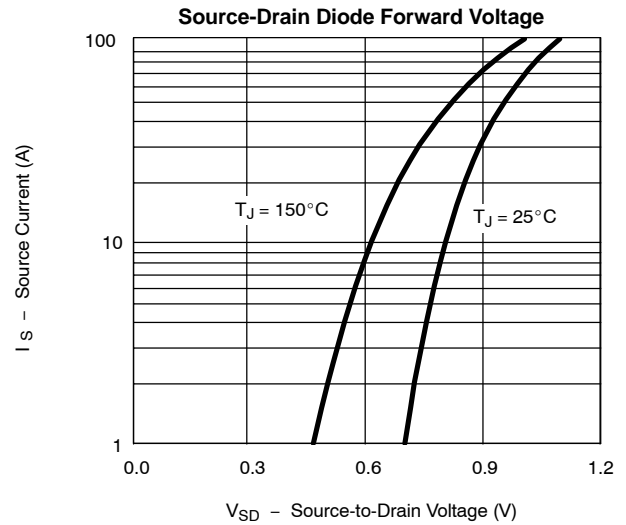
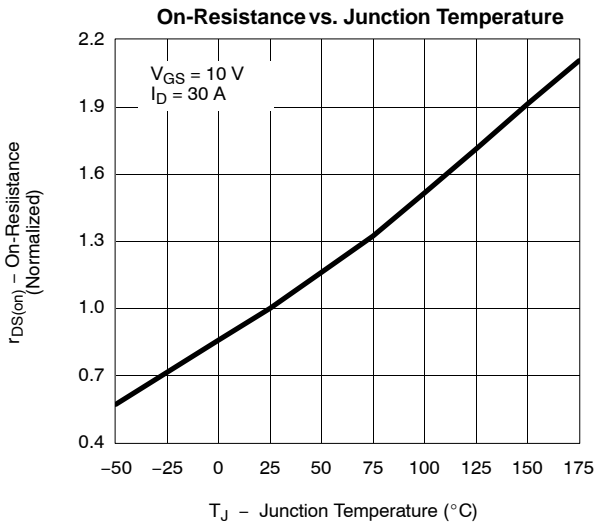


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)





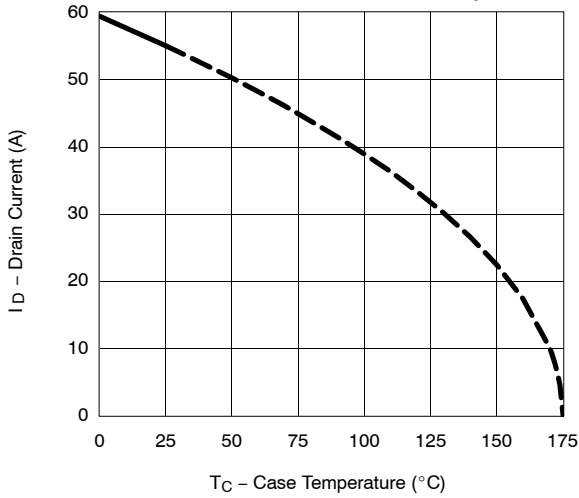
TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)



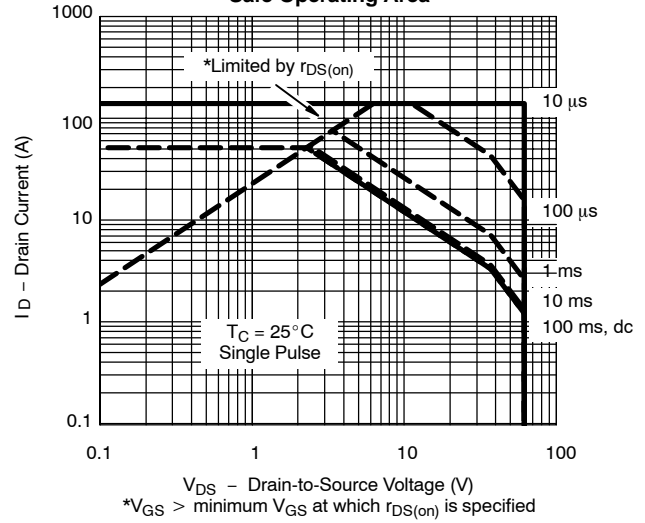


THERMAL RATINGS

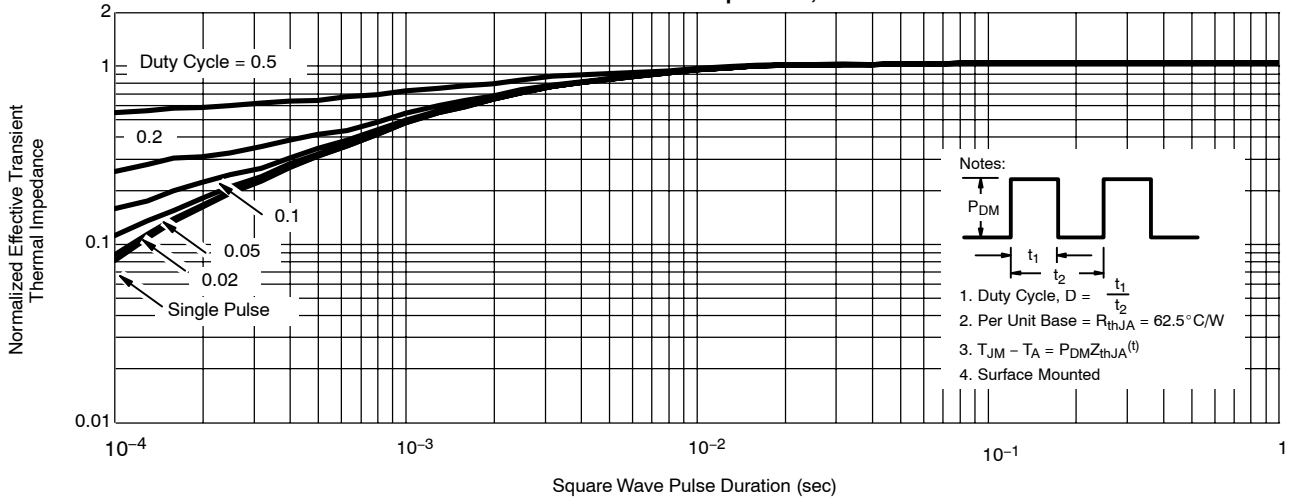
Maximum Drain Current vs. Case Temperature



Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Case



Vishay Siliconix maintains worldwide manufacturing capability. Products may be manufactured at one of several qualified locations. Reliability data for Silicon Technology and Package Reliability represent a composite of all qualified locations. For related documents such as package/tape drawings, part marking, and reliability data, see <http://www.vishay.com/ppg?73059>.