



N-Channel 55-V (D-S), 175°C MOSFET, Logic Level

PRODUCT SUMMARY		
$V_{(BR)DSS}$ (V)	$r_{DS(on)}$ (Ω)	I_D (A)
55	0.019 @ $V_{GS} = 10$ V	40
	0.025 @ $V_{GS} = 4.5$ V	35

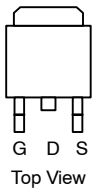
FEATURES

- TrenchFET® Power MOSFET
- 175°C Junction Temperature

APPLICATIONS

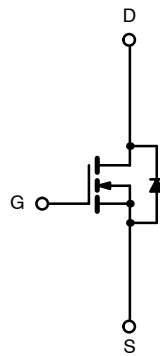
- Automotive
 - Full Injection Systems
 - Wipers
 - Door Modules

TO-263



DRAIN connected to TAB

Ordering Information: SUM40N05-19L



N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS ($T_C = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)				
Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	55	V
Gate-Source Voltage		V_{GS}	± 20	
Continuous Drain Current ($T_J = 175^\circ\text{C}$)	$T_C = 25^\circ\text{C}$	I_D	40	A
	$T_C = 100^\circ\text{C}$		28	
Pulsed Drain Current		I_{DM}	80	
Avalanche Current, Single Pulse		I_{AS}	30	
Avalanche Energy, Single Pulse	$L = 0.1$ mH	E_{AS}	45	mJ
Power Dissipation	$T_C = 25^\circ\text{C}$	P_D	65 ^a	W
	$T_A = 25^\circ\text{C}$		3.1 ^b	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55 to 175	$^\circ\text{C}$

THERMAL RESISTANCE RATINGS				
Parameter		Symbol	Limit	Unit
Junction-to-Ambient (PCB Mount) ^b		R_{thJA}	40	$^\circ\text{C}/\text{W}$
Junction-to-Case		R_{thJC}	2.3	

Notes:

- See SOA curve for voltage derating.
- Surface Mounted on FR4 Board, $t \leq 10$ sec.

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	55			V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _{DS} = 250 μA	1.0	2.0	3.0	
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ±20 V			±100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 55 V, V _{GS} = 0 V			1	μA
		V _{DS} = 55 V, V _{GS} = 0 V, T _J = 125 °C			50	
		V _{DS} = 55 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	40			A
Drain-Source On-State Resistance ^a	r _{DS(on)}	V _{GS} = 10 V, I _D = 20 A		0.0155	0.019	Ω
		V _{GS} = 10 V, I _D = 20 A, T _J = 125 °C			0.033	
		V _{GS} = 10 V, I _D = 20 A, T _J = 175 °C			0.040	
		V _{GS} = 4.5 V, I _D = 15 A		0.020	0.025	
Forward Transconductance ^a	g _{fs}	V _{DS} = 15 V, I _D = 20 A		50		S
Dynamic^b						
Input Capacitance	C _{iss}	V _{GS} = 0 V, V _{DS} = 25 V, f = 1 MHz		885		pF
Output Capacitance	C _{oss}			185		
Reversen Transfer Capacitance	C _{rss}			80		
Total Gate Charge ^c	Q _g	V _{DS} = 25 V, V _{GS} = 10 V, I _D = 35 A		10.5	13	nC
Gate-Source Charge ^c	Q _{gs}			4		
Gate-Drain Charge ^c	Q _{gd}			4.8		
Gate Resistance	R _g	f = 1.0 MHz		5.0		Ω
Turn-On Delay Time ^c	t _{d(on)}	V _{DD} = 25 V, R _L = 0.3 Ω I _D = 35 A, V _{GEN} = 10 V, R _G = 2.5 Ω		5	8	ns
Rise Time ^c	t _r			18	30	
Turn-Off Delay Time ^c	t _{d(off)}			20	30	
Fall Time ^c	t _f			100	150	
Source-Drain Diode Ratings and Characteristics (T_C = 25 °C)^b						
Continuous Current	I _S				35	A
Pulsed Current	I _{SM}				80	
Forward Voltage ^a	V _{SD}	I _F = 35 A, V _{GS} = 0 V		1.0	1.5	V
Reverse Recovery Time	t _{rr}	I _F = 35 A, di/dt = 100 A/μs		25	40	ns
Peak Reverse Recovery Current	I _{RM(REC)}			1.5	2.5	A
Reverse Recovery Charge	Q _{rr}			0.019	0.05	μC

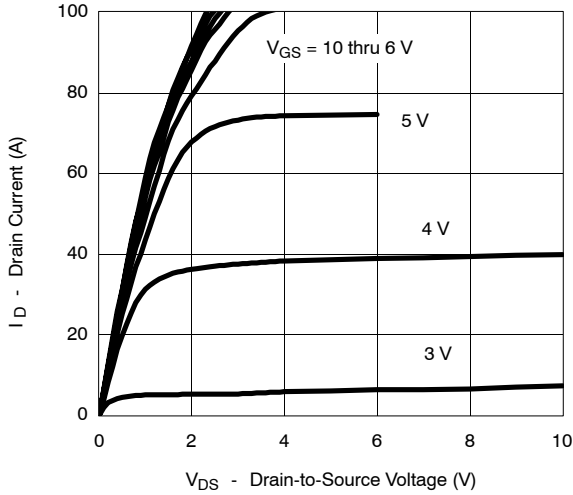
Notes:

- a. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.
- b. Guaranteed by design, not subject to production testing.
- c. Independent of operating temperature.

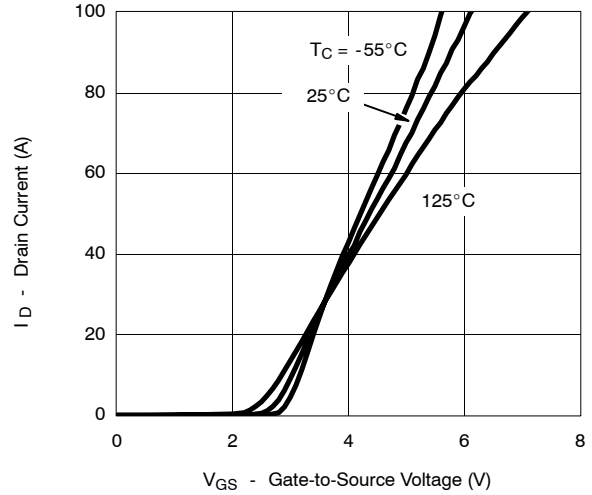


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

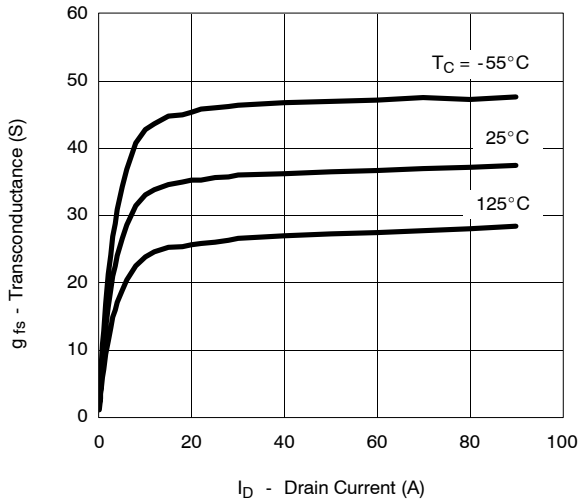
Output Characteristics



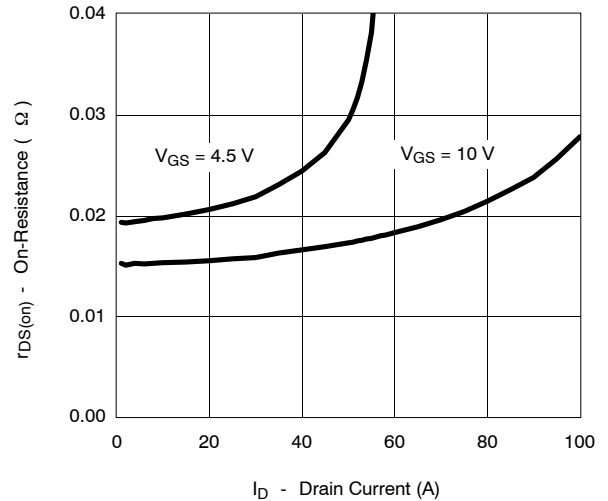
Transfer Characteristics



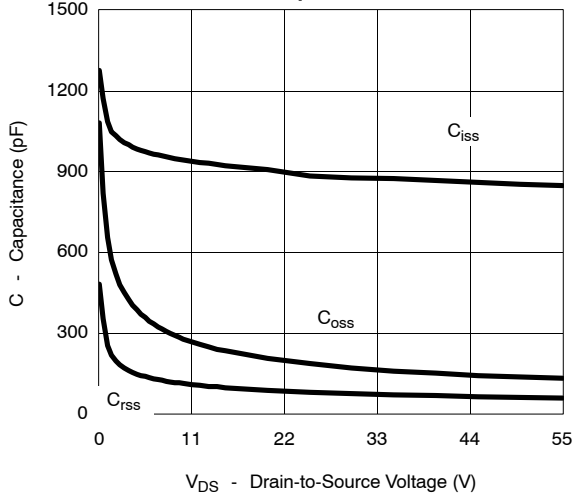
Transconductance



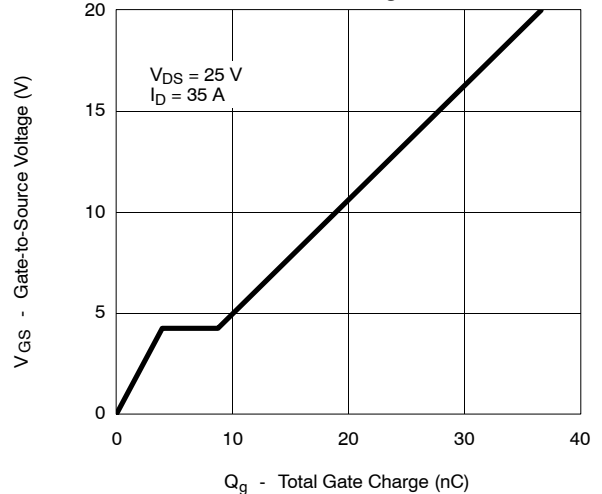
On-Resistance vs. Drain Current



Capacitance

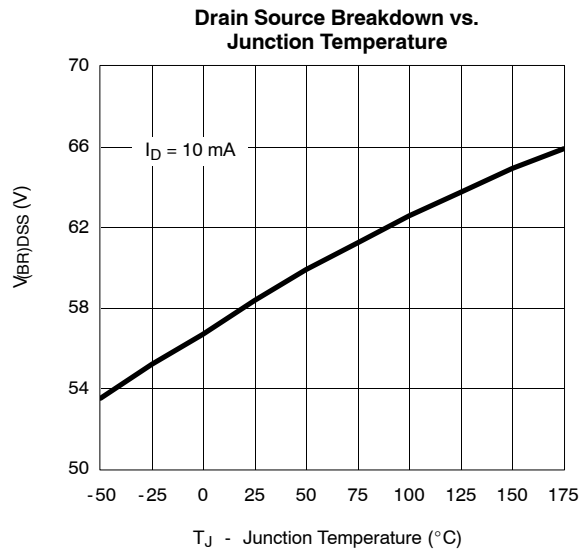
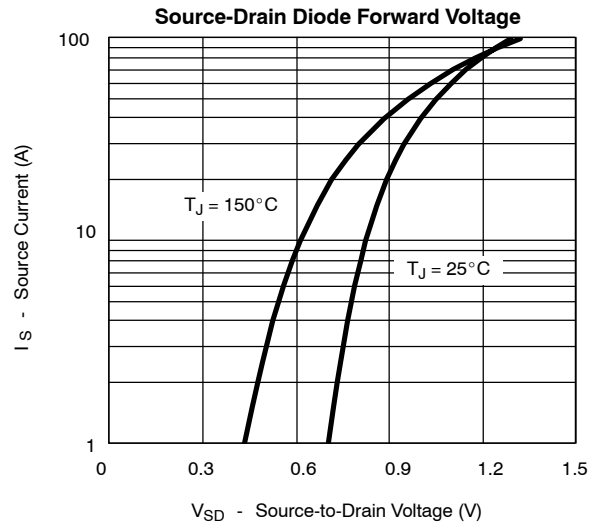
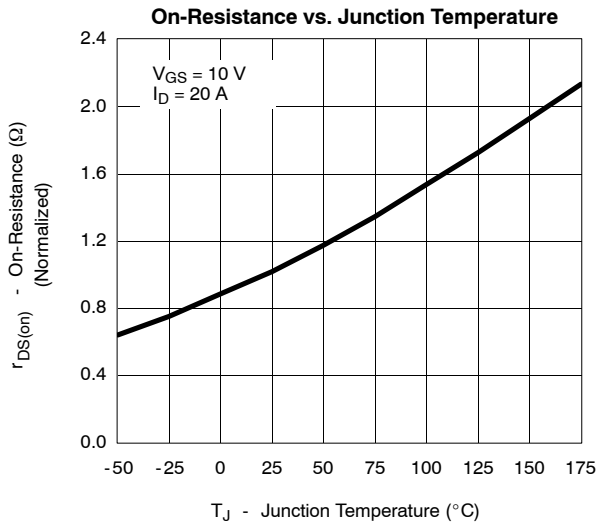


Gate Charge





TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)





THERMAL RATINGS

