



New Product

SUM70N04-07L
Vishay Siliconix

N-Channel 40-V (D-S) 175°C MOSFET

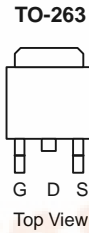
PRODUCT SUMMARY		
V _{(BR)DSS} (V)	r _{DS(on)} (Ω)	I _D (A)
40	0.0074 @ V _{GS} = 10 V	70 ^a
	0.011 @ V _{GS} = 4.5 V	67

FEATURES

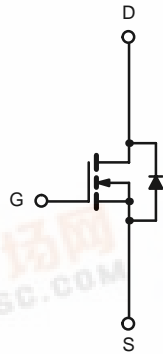
- TrenchFET® Power MOSFET
- 175°C Junction Temperature
- Low Threshold

APPLICATIONS

- Motor Control
- Automotive
 - 12-V Boardnet



Ordering Information: SUM70N04-07L



ABSOLUTE MAXIMUM RATINGS (T _C = 25°C UNLESS OTHERWISE NOTED)			
Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V _{DS}	40	V
Gate-Source Voltage	V _{GS}	±20	
Continuous Drain Current (T _J = 175°C)	I _D	T _C = 25°C	70 ^a
		T _C = 125°C	47
Pulsed Drain Current	I _{DM}	120	A
Avalanche Current	I _{AR}	40	
Repetitive Avalanche Energy ^b	E _{AR}	80	mJ
Maximum Power Dissipation ^b	P _D	T _C = 25°C	100 ^c
		T _A = 25°C ^d	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	R _{thJA}	40	°C/W
Junction-to-Case	R _{thJC}	1.4	

Notes

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



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 _{DS} = 0 V, I _D = 250 μA	40			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} = 32 V, V _{GS} = 0 V			1	μA
		V _{DS} = 32 V, V _{GS} = 0 V, T _J = 125 °C			50	
		V _{DS} = 32 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	100			A
Drain-Source On-State Resistance ^a	r _{DS(on)}	V _{GS} = 10 V, I _D = 30 A		0.006	0.0074	Ω
		V _{GS} = 4.5 V, I _D = 10 A		0.0085	0.011	
		V _{GS} = 10 V, I _D = 30 A, T _J = 125 °C			0.012	
		V _{GS} = 10 V, I _D = 30 A, T _J = 175 °C			0.015	
Forward Transconductance ^a	g _{fs}	V _{DS} = 15 V, I _D = 30 A	20			S
Dynamic^b						
Input Capacitance	C _{iss}	V _{GS} = 0 V, V _{DS} = 25 V, f = 1 MHz		2800		pF
Output Capacitance	C _{oss}			320		
Reverse Transfer Capacitance	C _{rss}			190		
Total Gate Charge ^c	Q _g	V _{DS} = 20 V, V _{GS} = 10 V, I _D = 50 A		50	75	nC
Gate-Source Charge ^c	Q _{gs}			10		
Gate-Drain Charge ^c	Q _{gd}			10		
Gate Resistance	R _G			2.0		Ω
Turn-On Delay Time ^c	t _{d(on)}	V _{DD} = 20 V, R _L = 0.4 Ω I _D ≅ 50 A, V _{GEN} = 10 V, R _G = 2.5 Ω		11	20	ns
Rise Time ^c	t _r			20	30	
Turn-Off Delay Time ^c	t _{d(off)}			40	60	
Fall Time ^c	t _f			15	25	
Source-Drain Diode Ratings and Characteristics (T_C = 25 °C)^b						
Continuous Current	I _S				66	A
Pulsed Current	I _{SM}				100	
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		30	50	ns
Peak Reverse Recovery Current	I _{RM(REC)}			1.6	2.4	A
Reverse Recovery Charge	Q _{rr}			0.024	0.06	μC

Notes

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

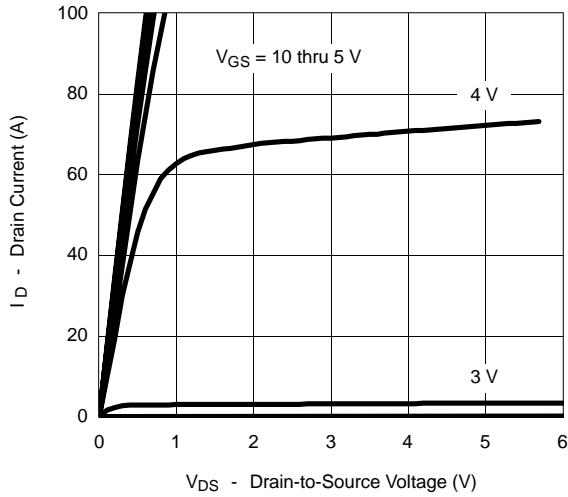


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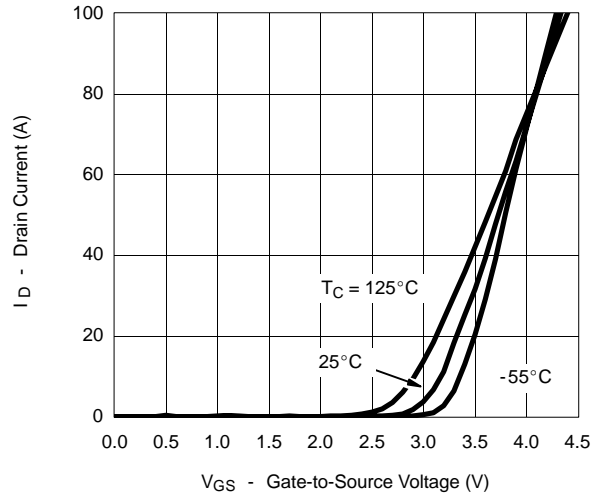
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TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

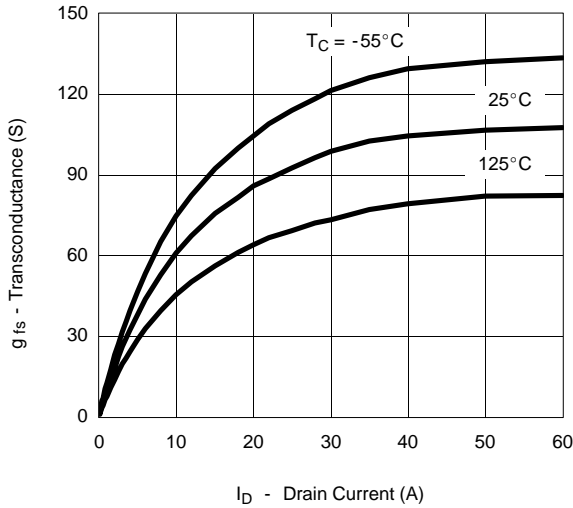
Output Characteristics



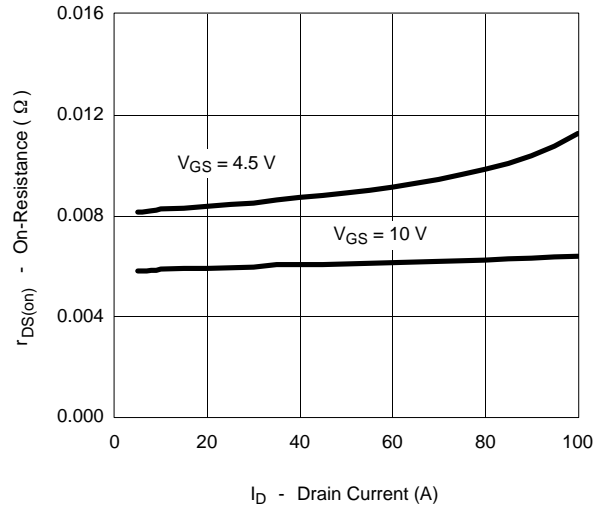
Transfer Characteristics



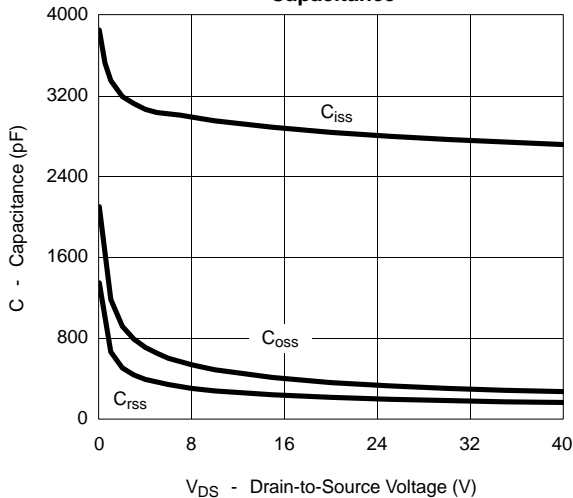
Transconductance



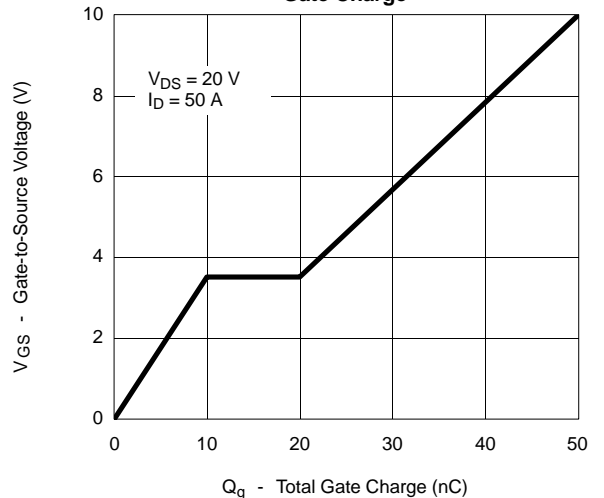
On-Resistance vs. Drain Current



Capacitance

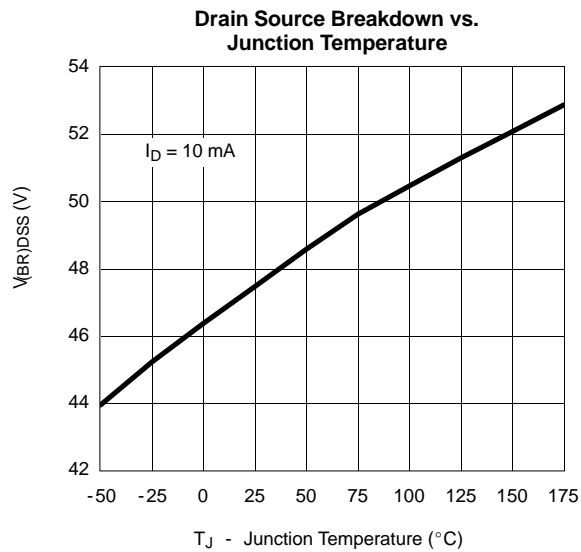
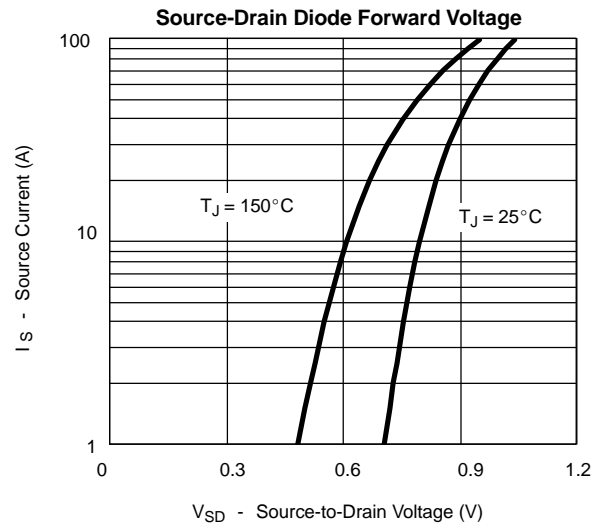
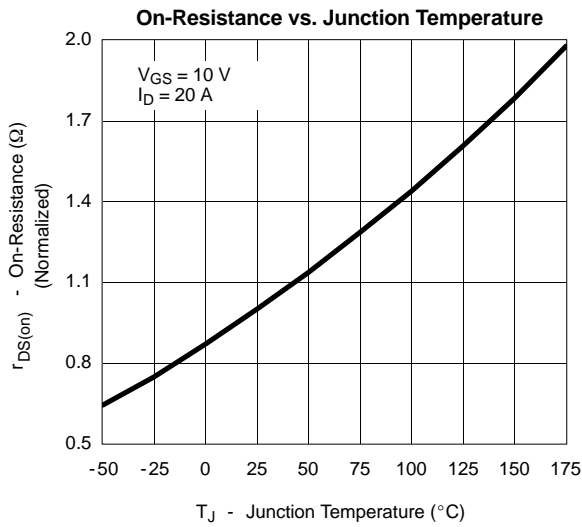


Gate Charge





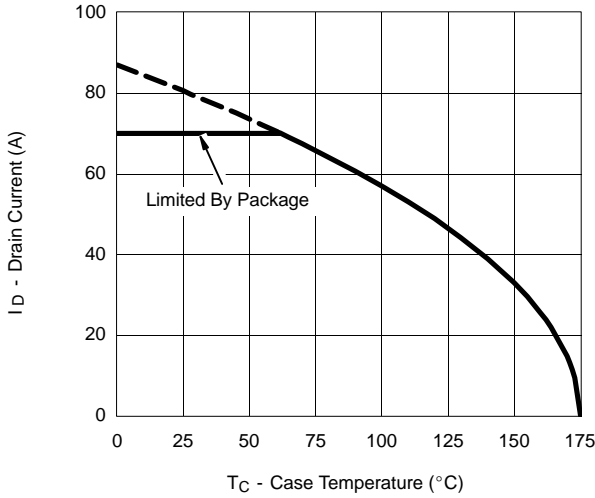
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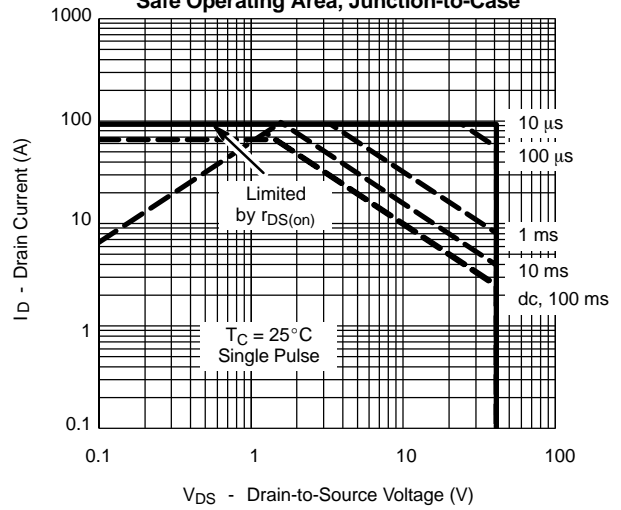


THERMAL RATINGS

Maximum Avalanche and Drain Current vs. Case Temperature



Safe Operating Area, Junction-to-Case



Normalized Thermal Transient Impedance, Junction-to-Case

