



N-Channel 40-V (D-S), 175°C MOSFET

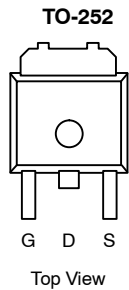
PRODUCT SUMMARY		
$V_{(BR)DSS}$ (V)	$r_{DS(on)}$ (Ω)	I_D (A) ^c
40	0.0074 @ $V_{GS} = 10$ V	65
	0.011 @ $V_{GS} = 4.5$ V	54

FEATURES

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

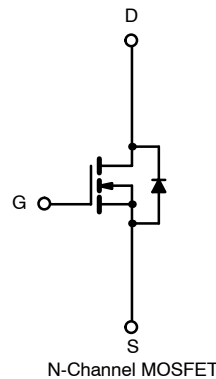
APPLICATIONS

- Motor Control
- Automotive
 - 12-V Boardnet



Drain Connected to Tab

Ordering Information: SUD50N04-07L



ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)			
Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	40	V
Gate-Source Voltage	V_{GS}	± 20	
Continuous Drain Current ($T_J = 175^\circ\text{C}$)	I_D	$T_C = 25^\circ\text{C}$	65 ^c
		$T_C = 100^\circ\text{C}$	46 ^c
Pulsed Drain Current	I_{DM}	100	A
Avalanche Current	I_{AR}	40	
Repetitive Avalanche Energy ^a	E_{AR}	80	
Power Dissipation	P_D	65	W
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55 to 175	$^\circ\text{C}$

THERMAL RESISTANCE RATINGS				
Parameter	Symbol	Typical	Maximum	Unit
Junction-to-Ambient ^b	R_{thJA}	$t \leq 10$ sec	18	22
		Steady State	40	50
Junction-to-Case	R_{thJC}	1.9	2.3	$^\circ\text{C/W}$

Notes:

- Duty cycle $\leq 1\%$.
- Surface mounted on 1" FR4 board.
- Based on maximum allowable Junction Temperature. Package limitation current is 50 A.

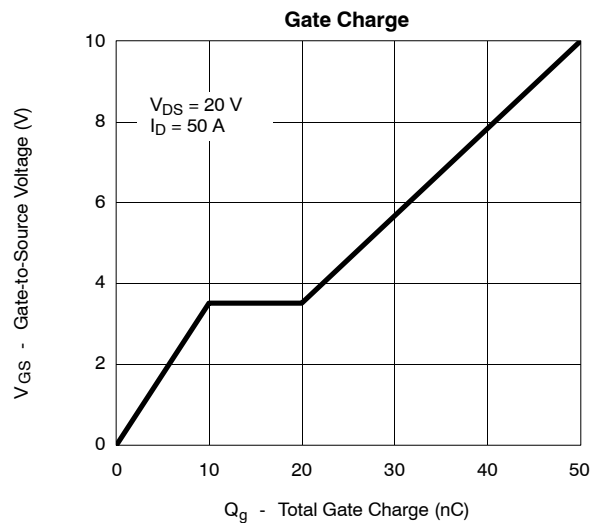
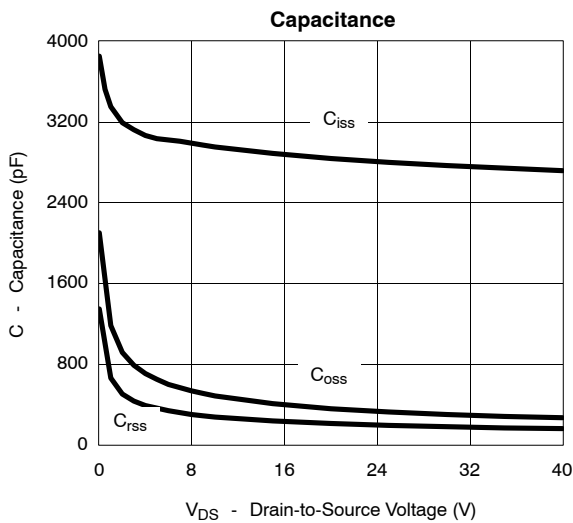
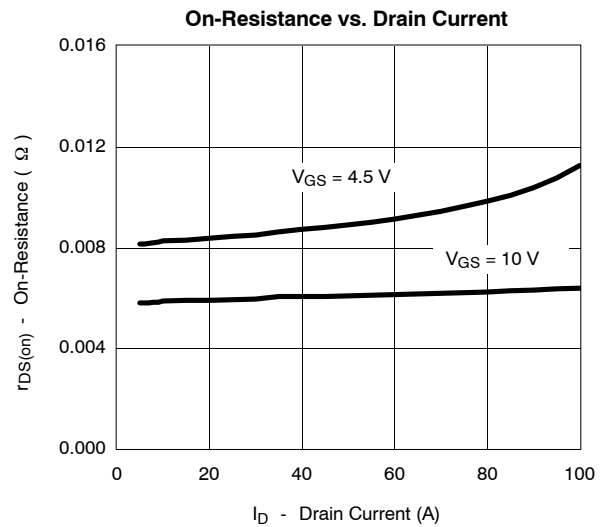
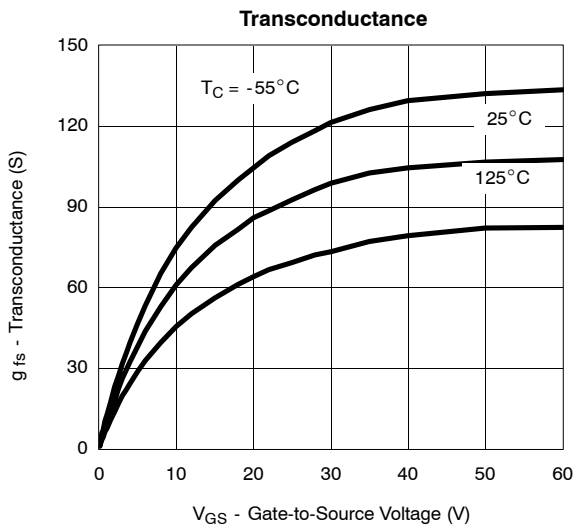
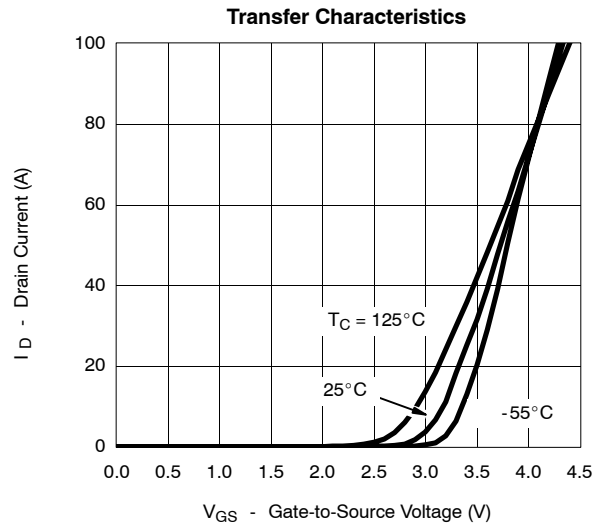
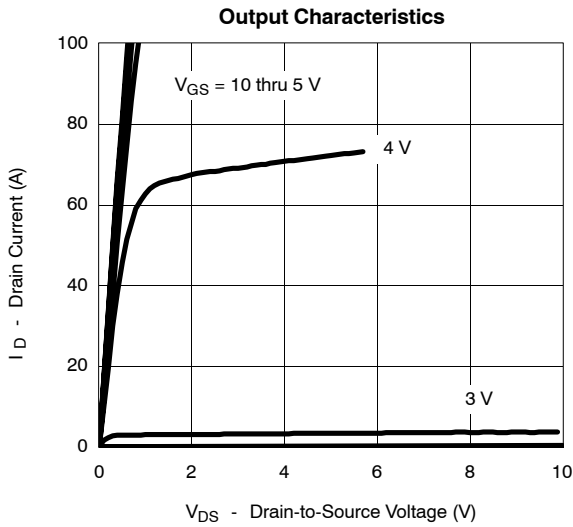
SPECIFICATIONS (T _J = 25 °C UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} = 0 V, I _D = 250 μA	40			V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _{DS} = 250 μA	1		3	
Gate-Body Leakage	I _{GSS}	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			150	
On-State Drain Current ^a	I _{D(on)}	V _{DS} = 5 V, V _{GS} = 10 V	65			A
Drain-Source On-State Resistance ^a	r _{DS(on)}	V _{GS} = 10 V, I _D = 20 A		0.006	0.0074	Ω
		V _{GS} = 10 V, I _D = 20 A, T _J = 125 °C			0.012	
		V _{GS} = 10 V, I _D = 20 A, T _J = 175 °C			0.015	
		V _{GS} = 4.5 V, I _D = 10 A		0.0085	0.011	
Forward Transconductance ^a	g _{fs}	V _{DS} = 15 V, I _D = 15 A	20	57		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 Ciode Ratings and Characteristics (T_C = 25 °C)^b						
Continuous Current	I _s				43	A
Pulsed Current	I _{SM}				100	
Forward Voltage ^a	V _{SD}	I _F = 30 A, V _{GS} = 0 V		0.90	1.50	V
Reverse Recovery Time	t _{rr}	I _F = 30 A, di/dt = 100 A/μs		30	45	ns

Notes:

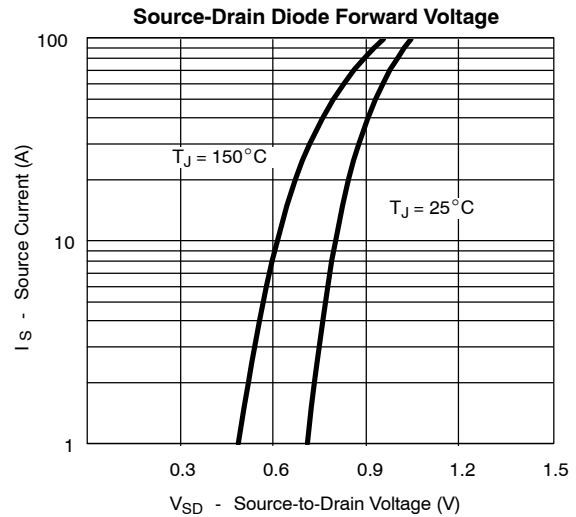
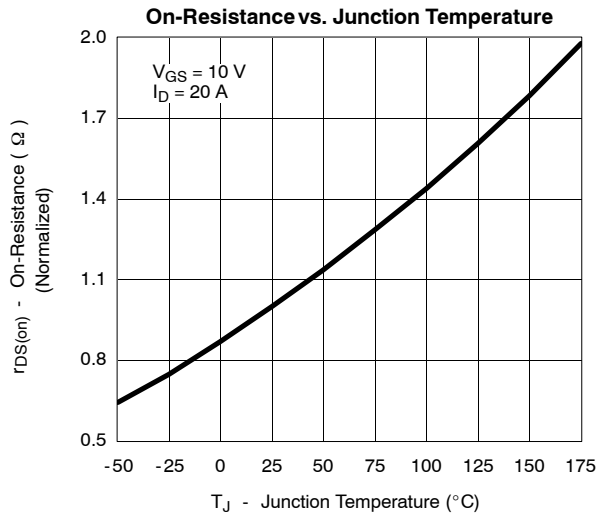
- Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.
- Guaranteed by design, not subject to production testing.
- Independent of operating temperature.



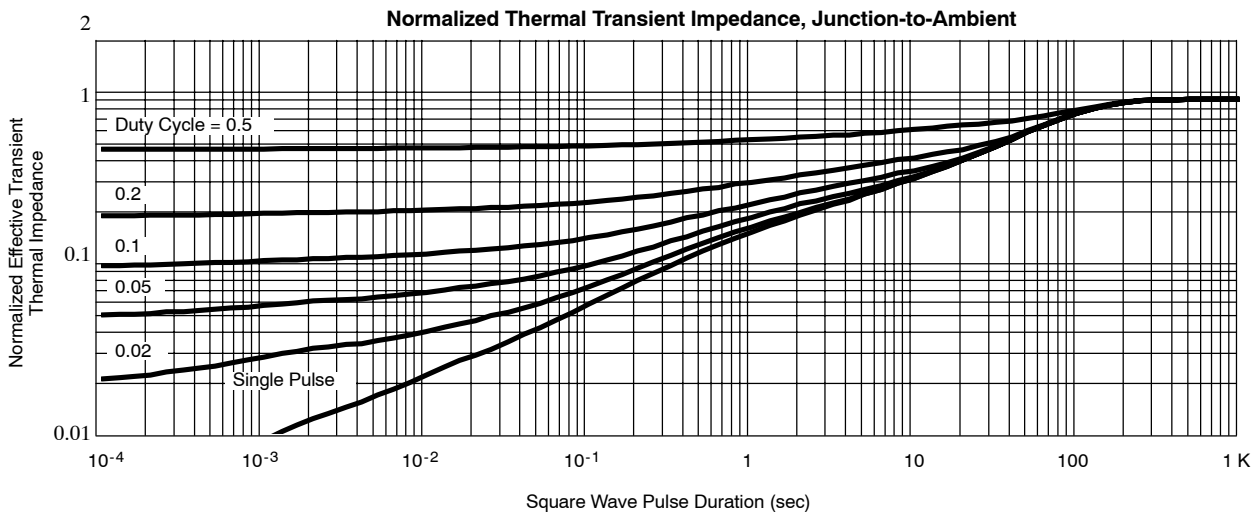
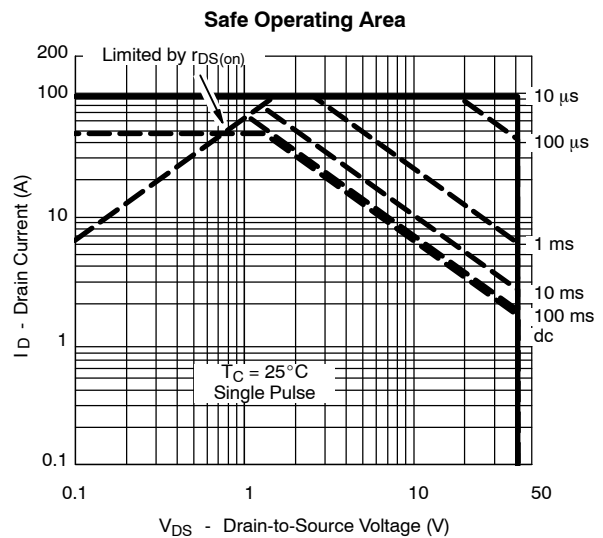
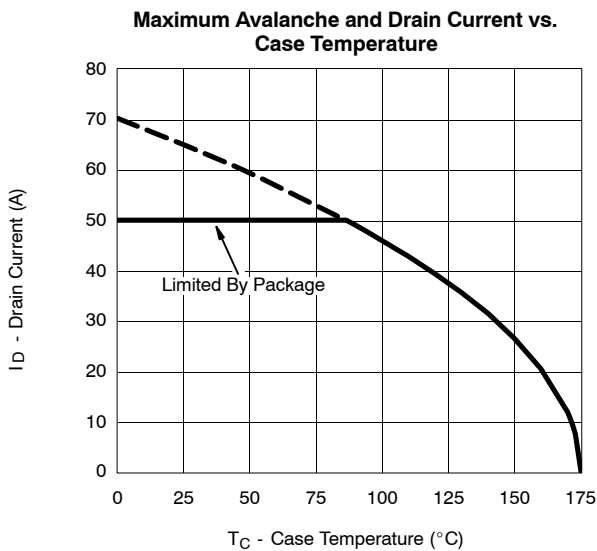
TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)



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THERMAL RATINGS





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