



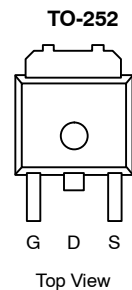
N-Channel 40-V (D-S), 175°C MOSFET

PRODUCT SUMMARY		
$V_{(BR)DSS}$ (V)	$r_{DS(on)}$ (Ω)	I_D (A)
40	0.010 @ $V_{GS} = 10$ V	30 ^a
	0.014 @ $V_{GS} = 4.5$ V	30 ^a

FEATURES

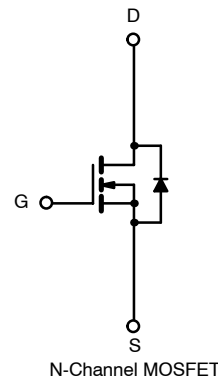
- TrenchFET® Power MOSFET
- 175°C Maximum Junction Temperature
- 100% R_g Tested

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Drain Connected to Tab

Order Number:
SUD30N04-10



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	$T_C = 25^\circ\text{C}$	30 ^a
		$T_C = 100^\circ\text{C}$	30 ^a
Pulsed Drain Current	I_{DM}	120	A
Avalanche Current	I_{AR}	50	
Repetitive Avalanche Energy ^b	E_{AR}	125	mJ
Power Dissipation	P_D	97 ^c	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	R_{thJA}	45	55	$^\circ\text{C/W}$	
		Free Air	110		125
Junction-to-Case	R_{thJC}	1.5	1.8		

Notes:

- Package limited.
- Duty cycle $\leq 1\%$.
- See SOA curve for voltage derating.
- Surface mounted on 1" FR4 board.

SPECIFICATIONS (T_J = 25 °C UNLESS OTHERWISE NOTED)

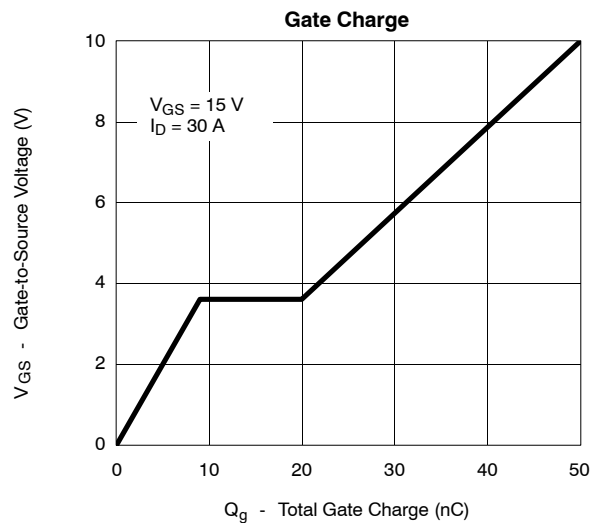
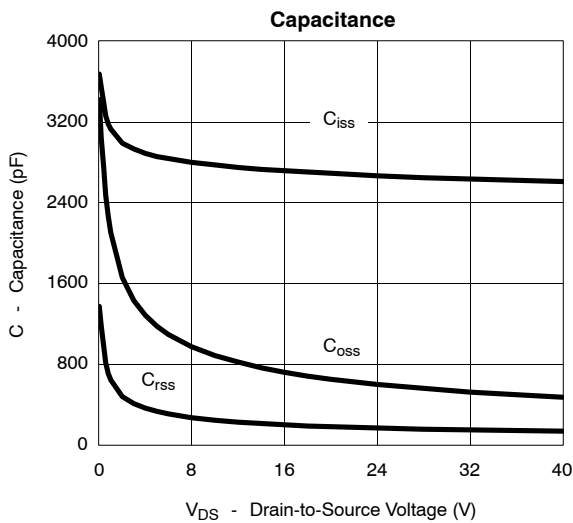
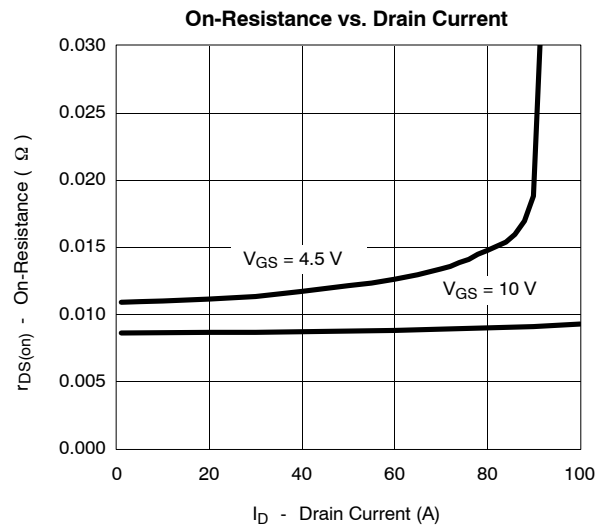
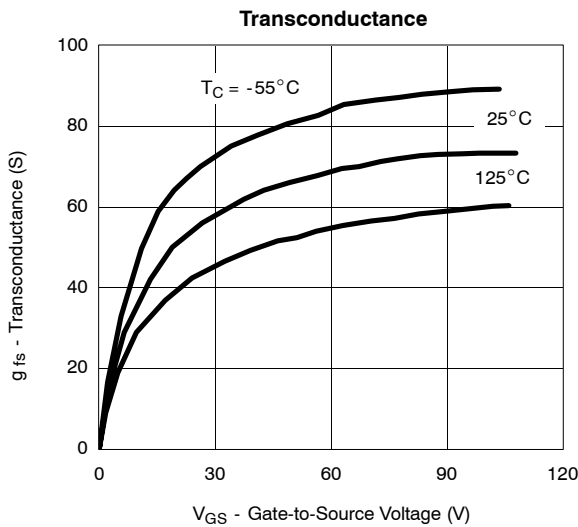
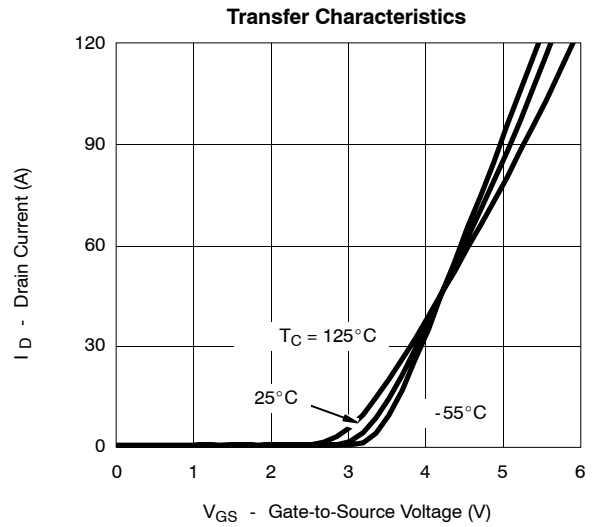
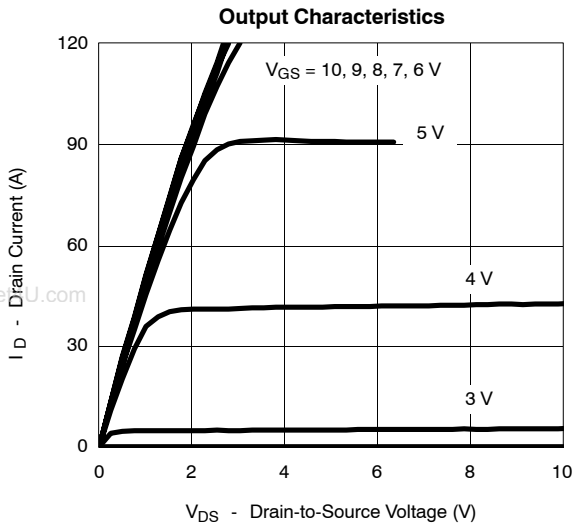
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} = 0 V, I _D = 250 μA	40			V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _{DS} = 250 μA	1		3	
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ±20 V			±100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 40 V, V _{GS} = 0 V			1	μA
		V _{DS} = 40 V, V _{GS} = 0 V, T _J = 125 °C			50	
		V _{DS} = 40 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	30			A
Drain-Source On-State Resistance ^a	r _{DS(on)}	V _{GS} = 10 V, I _D = 30 A		0.085	0.010	Ω
		V _{GS} = 10 V, I _D = 30 A, T _J = 125 °C		0.014	0.017	
		V _{GS} = 10 V, I _D = 30 A, T _J = 175 °C		0.0185	0.022	
		V _{GS} = 4.5 V, I _D = 10 A		0.0115	0.014	
		V _{GS} = 4.5 V, I _D = 10 A, T _J = 125 °C		0.0195	0.024	
V _{GS} = 4.5 V, I _D = 10 A, T _J = 175 °C		0.025	0.031			
Forward Transconductance ^a	g _{fs}	V _{DS} = 15 V, I _D = 30 A	20	57		S
Dynamic^b						
Input Capacitance	C _{iss}	V _{GS} = 0 V, V _{DS} = 25 V, f = 1 MHz		2700		pF
Output Capacitance	C _{oss}			600		
Reverse Transfer Capacitance	C _{rss}			160		
Total Gate Charge ^c	Q _g	V _{DS} = 15 V, V _{GS} = 10 V, I _D = 30 A		50	100	nC
Gate-Source Charge ^c	Q _{gs}			9		
Gate-Drain Charge ^c	Q _{gd}			11		
Gate Resistance	R _g		1		3.6	Ω
Turn-On Delay Time ^c	t _{d(on)}	V _{DD} = 15 V, R _L = 0.5 Ω I _D ≈ 30 A, V _{GEN} = 10 V, R _G = 2.5 Ω		14	30	ns
Rise Time ^c	t _r			13	30	
Turn-Off Delay Time ^c	t _{d(off)}			45	90	
Fall Time ^c	t _f			25	50	
Source-Drain Ciode Ratings and Characteristics (T_C = 25 °C)^b						
Continuous Current	I _S				30	A
Pulsed Current	I _{SM}				120	
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		50	100	ns

Notes:

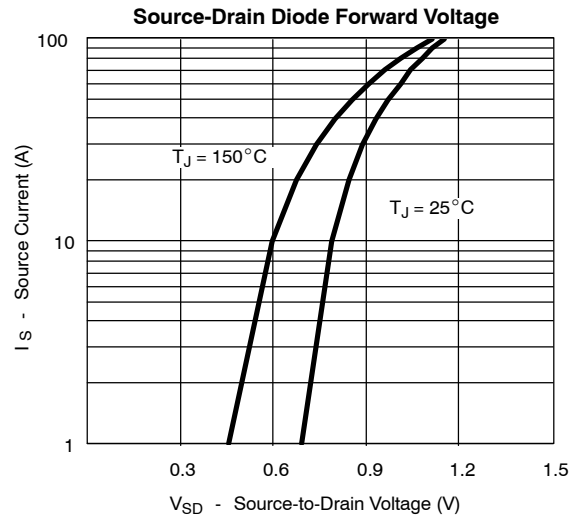
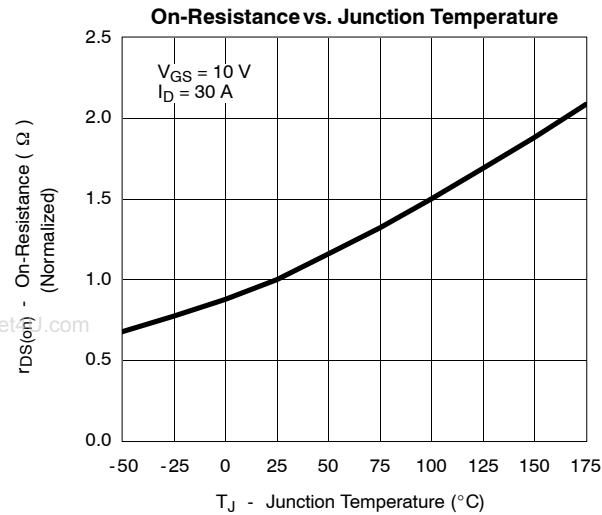
- Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.
- Guaranteed by design, not subject to production testing.
- Independent of operating temperature.



TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)



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THERMAL RATINGS

