

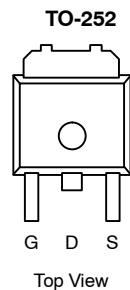


N-Channel 40-V (D-S), 175°C MOSFET

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

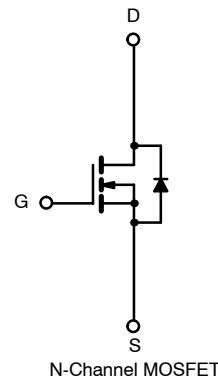
FEATURES

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



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	$^\circ\text{C}/\text{W}$	
		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.

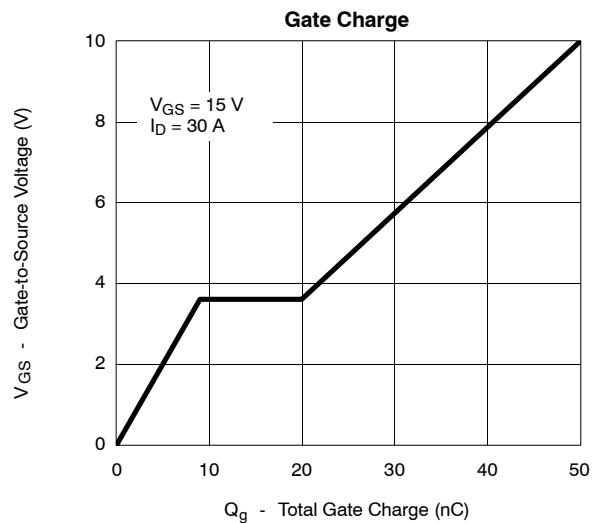
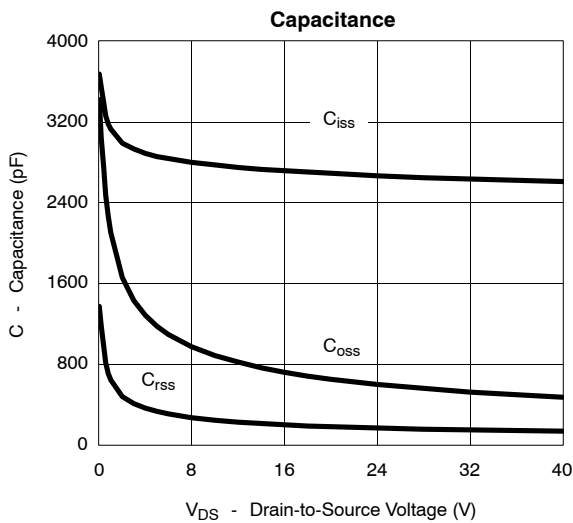
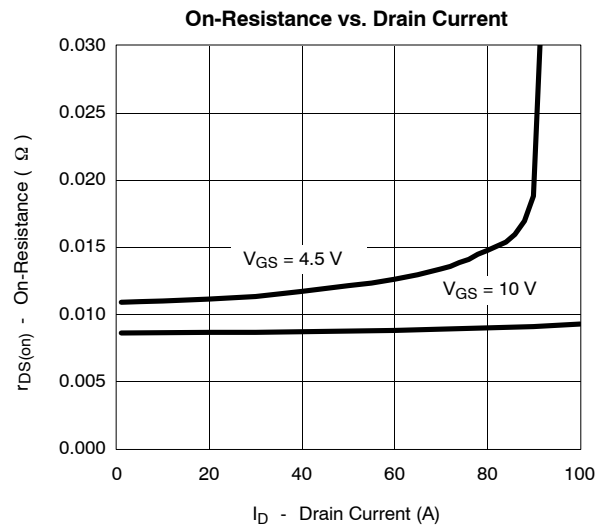
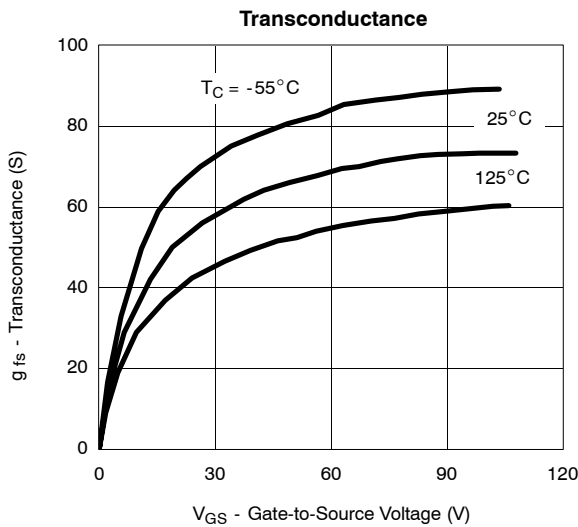
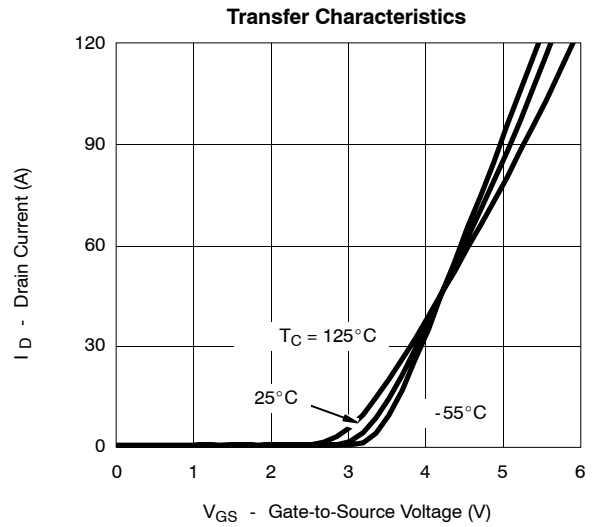
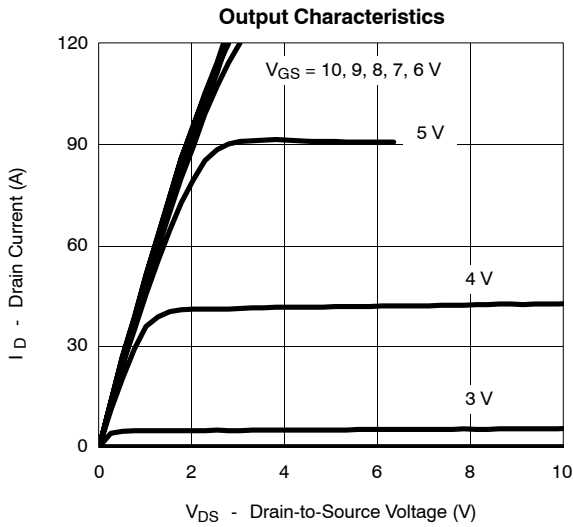
SPECIFICATIONS ($T_J = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0\text{ V}, I_D = 250\ \mu\text{A}$	40			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_{DS} = 250\ \mu\text{A}$	1		3	
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 40\text{ V}, V_{GS} = 0\text{ V}$			1	μA
		$V_{DS} = 40\text{ V}, V_{GS} = 0\text{ V}, T_J = 125^\circ\text{C}$			50	
		$V_{DS} = 40\text{ V}, V_{GS} = 0\text{ V}, T_J = 175^\circ\text{C}$			150	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} = 5\text{ V}, V_{GS} = 10\text{ V}$	30			A
Drain-Source On-State Resistance ^a	$r_{DS(on)}$	$V_{GS} = 10\text{ V}, I_D = 30\text{ A}$		0.085	0.010	Ω
		$V_{GS} = 10\text{ V}, I_D = 30\text{ A}, T_J = 125^\circ\text{C}$		0.014	0.017	
		$V_{GS} = 10\text{ V}, I_D = 30\text{ A}, T_J = 175^\circ\text{C}$		0.0185	0.022	
		$V_{GS} = 4.5\text{ V}, I_D = 10\text{ A}$		0.0115	0.014	
		$V_{GS} = 4.5\text{ V}, I_D = 10\text{ A}, T_J = 125^\circ\text{C}$		0.0195	0.024	
$V_{GS} = 4.5\text{ V}, I_D = 10\text{ A}, T_J = 175^\circ\text{C}$		0.025	0.031			
Forward Transconductance ^a	g_{fs}	$V_{DS} = 15\text{ V}, I_D = 30\text{ A}$	20	57		S
Dynamic^b						
Input Capacitance	C_{iss}	$V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$		2700		pF
Output Capacitance	C_{oss}			600		
Reverse Transfer Capacitance	C_{rss}			160		
Total Gate Charge ^c	Q_g	$V_{DS} = 15\text{ V}, V_{GS} = 10\text{ V}, I_D = 30\text{ A}$		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	$t_{d(on)}$	$V_{DD} = 15\text{ V}, R_L = 0.5\ \Omega$ $I_D \approx 30\text{ A}, V_{GEN} = 10\text{ V}, R_G = 2.5\ \Omega$		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 ($T_C = 25^\circ\text{C}$)^b						
Continuous Current	I_S				30	A
Pulsed Current	I_{SM}				120	
Forward Voltage ^a	V_{SD}	$I_F = 30\text{ A}, V_{GS} = 0\text{ V}$		0.90	1.50	V
Reverse Recovery Time	t_{rr}	$I_F = 30\text{ A}, di/dt = 100\text{ A}/\mu\text{s}$		50	100	ns

Notes:

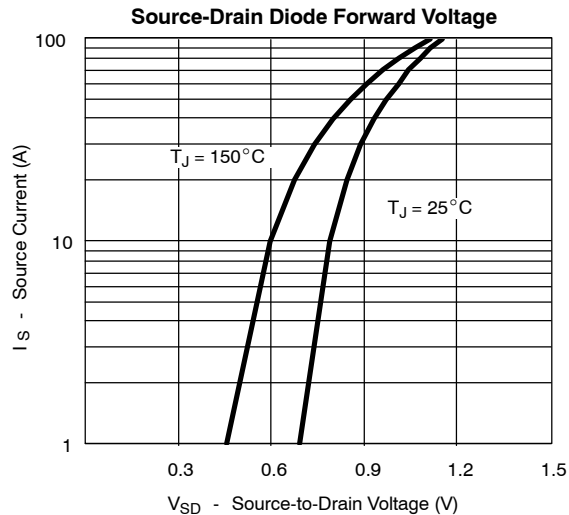
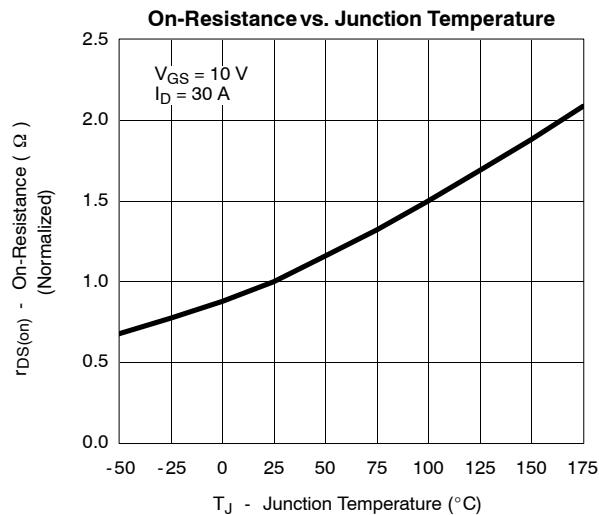
- Pulse test; pulse width $\leq 300\ \mu\text{s}$, duty cycle $\leq 2\%$.
- Guaranteed by design, not subject to production testing.
- Independent of operating temperature.



TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)



TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)



THERMAL RATINGS

