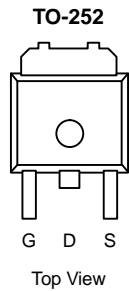




N-Channel 40-V (D-S) 175°C MOSFET

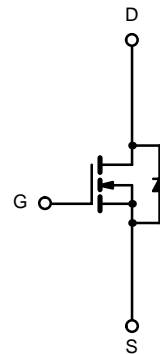
PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
40	0.025 @ $V_{GS} = 10$ V	25
	0.040 @ $V_{GS} = 4.5$ V	20

175°C Rated
Maximum Junction Temperature
TrenchFET®
Power MOSFETS



Order Number:
SUD25N04-25

Drain Connected to Tab



N-Channel MOSFET

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 ($T_J = 175^\circ\text{C}$) ^b	$T_C = 25^\circ\text{C}$	I_D	25	A
	$T_C = 125^\circ\text{C}$		15	
Pulsed Drain Current		I_{DM}	50	
Continuous Source Current (Diode Conduction) ^b		I_S	50	
Avalanche Current		I_{AR}	25	mJ
Repetitive Avalanche Energy (Duty Cycle $\leq 1\%$)	$L = 0.1$ mH	E_{AR}	31	
Maximum Power Dissipation	$T_C = 25^\circ\text{C}$	P_D	33 ^b	W
	$T_A = 25^\circ\text{C}$		3 ^b	
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	$t \leq 10$ sec	R_{thJA}	20	25	$^\circ\text{C/W}$
	Steady State		40	50	
Junction-to-Case		R_{thJC}	3.7	4.5	

Notes

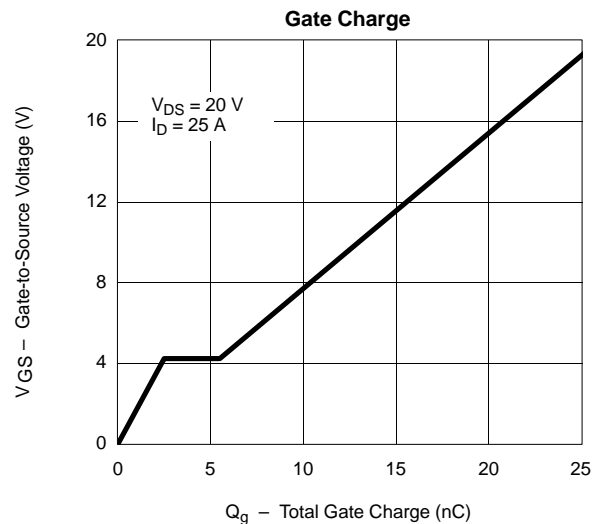
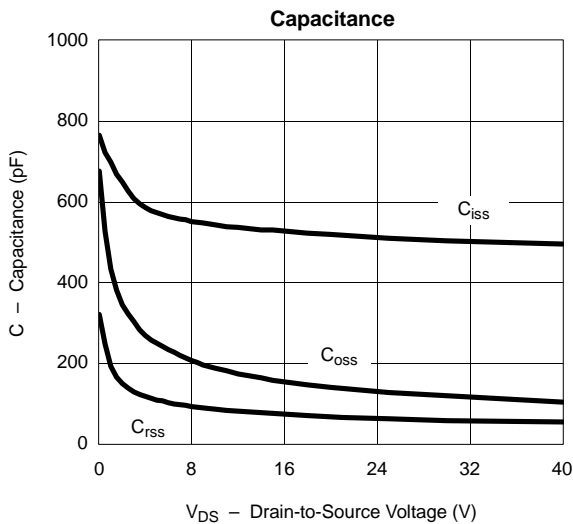
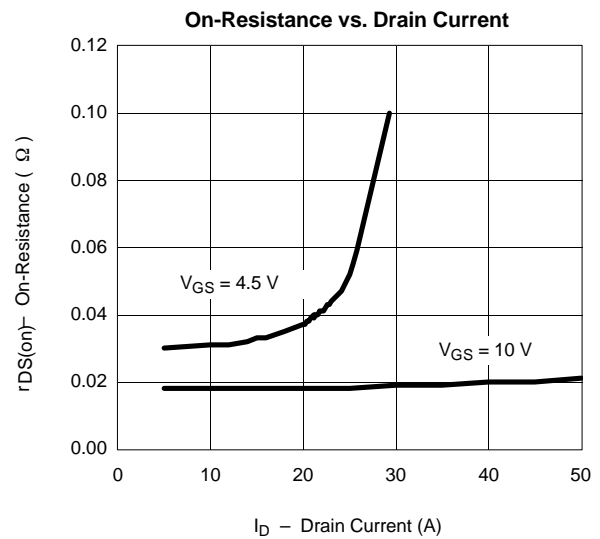
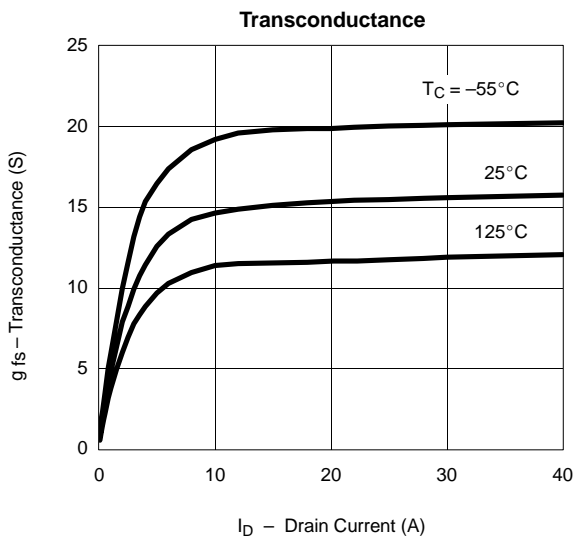
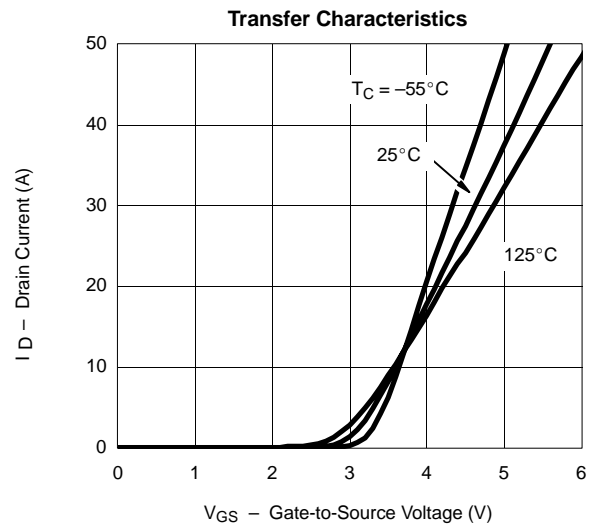
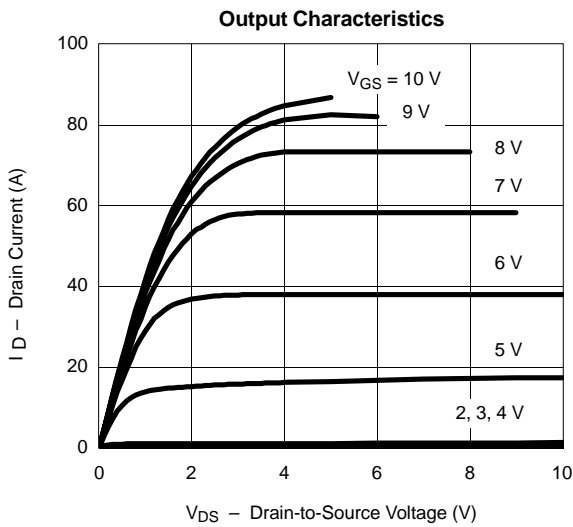
- a. Surface Mounted on 1" x 1" FR4 Board.
- b. See SOA curve for voltage derating.

SPECIFICATIONS ($T_J = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Condition	Min	Typ ^a	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	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\ \mu\text{A}$	1.0	2.0	3.0	
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 ^b	$I_{D(on)}$	$V_{DS} = 5\text{ V}, V_{GS} = 10\text{ V}$	50			A
Drain-Source On-State Resistance ^b	$r_{DS(on)}$	$V_{GS} = 10\text{ V}, I_D = 25\text{ A}$		0.02	0.025	Ω
		$V_{GS} = 10\text{ V}, I_D = 25\text{ A}, T_J = 125^\circ\text{C}$			0.040	
		$V_{GS} = 10\text{ V}, I_D = 25\text{ A}, T_J = 175^\circ\text{C}$			0.053	
		$V_{GS} = 4.5\text{ V}, I_D = 10\text{ A}$		0.031	0.040	
Forward Transconductance ^b	g_{fs}	$V_{DS} = 15\text{ V}, I_D = 25\text{ A}$		15		S
Dynamic^a						
Input Capacitance	C_{iss}	$V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, F = 1\text{ MHz}$		510		pF
Output Capacitance	C_{oss}			125		
Reverse Transfer Capacitance	C_{rss}			65		
Total Gate Charge ^c	Q_g	$V_{DS} = 20\text{ V}, V_{GS} = 10\text{ V}, I_D = 25\text{ A}$		13	20	nC
Gate-Source Charge ^c	Q_{gs}			2.5		
Gate-Drain Charge ^c	Q_{gd}			3		
Turn-On Delay Time ^c	$t_{d(on)}$	$V_{DD} = 20\text{ V}, R_L = 0.8\ \Omega$ $I_D = 25\text{ A}, V_{GEN} = 10\text{ V}, R_G = 2.5\ \Omega$		5	10	ns
Rise Time ^c	t_r			47	70	
Turn-Off Delay Time ^c	$t_{d(off)}$			15	30	
Fall Time ^c	t_f			5	10	
Source-Drain Diode Ratings and Characteristic ($T_C = 25^\circ\text{C}$)						
Pulsed Current	I_{SM}				50	A
Diode Forward Voltage ^b	V_{SD}	$I_F = 25\text{ A}, V_{GS} = 0\text{ V}$		1.1	1.3	V
Source-Drain Reverse Recovery Time	t_{rr}	$I_F = 25\text{ A}, di/dt = 100\text{ A}/\mu\text{s}$		17	30	ns

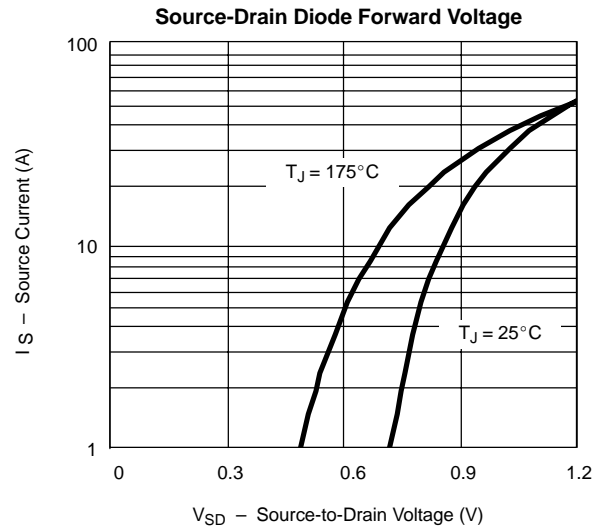
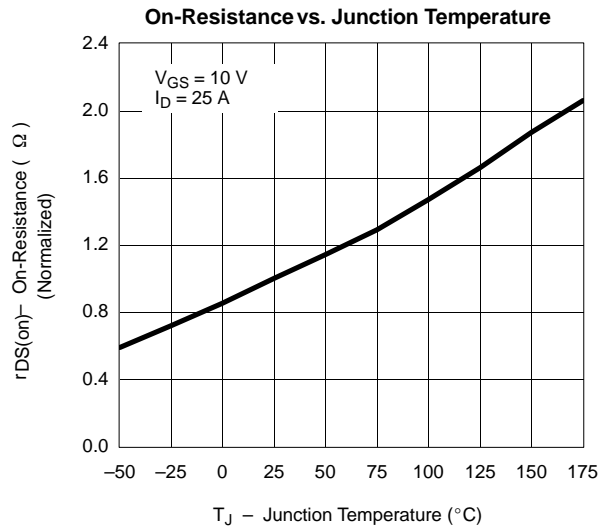
Notes

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

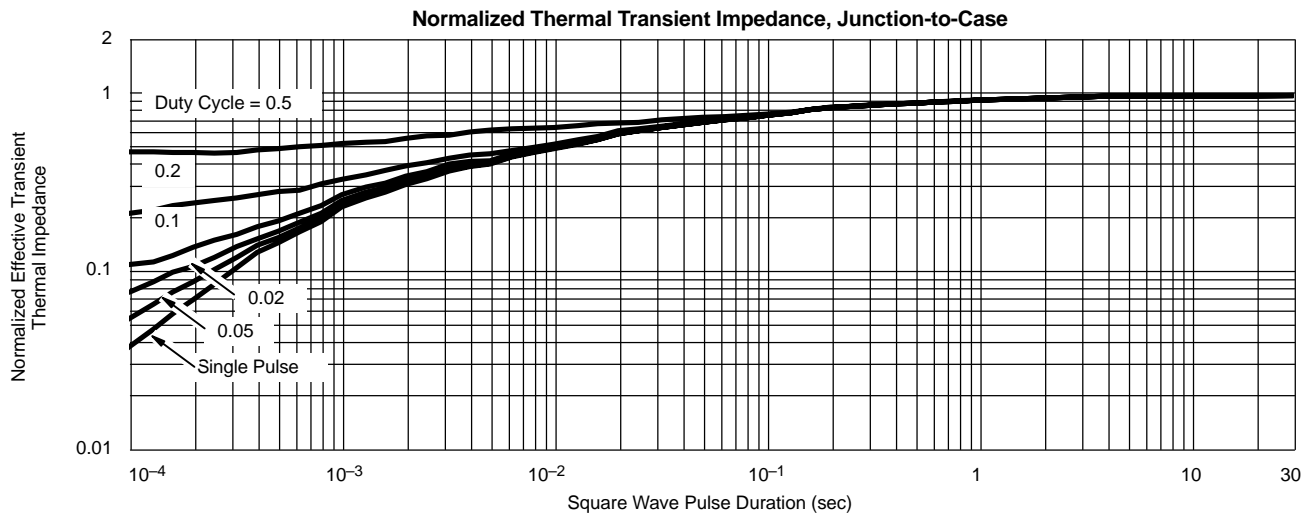
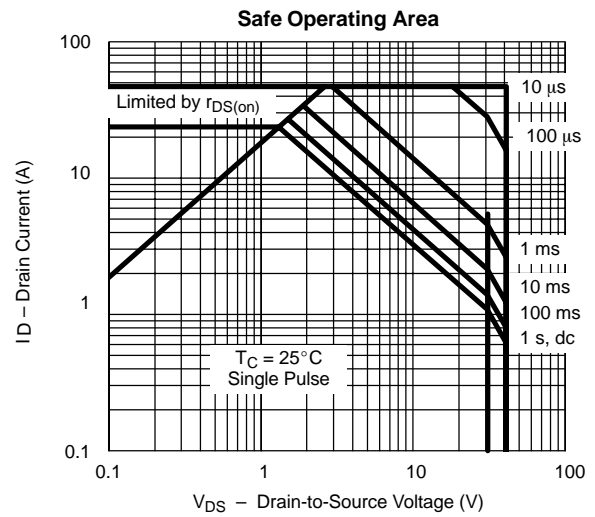
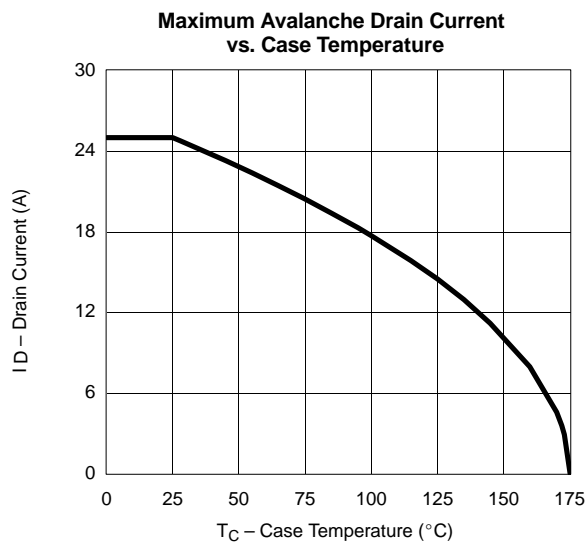
TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)



TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)



THERMAL RATINGS





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