



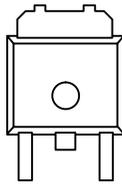
## N-Channel 80-V (D-S) 175°C MOSFET

PRODUCT SUMMARY		
$V_{DS}$ (V)	$r_{DS(on)}$ ( $\Omega$ )	$I_D$ (A)
80	0.016 @ $V_{GS} = 10$ V	40

### FEATURES

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

TO-252



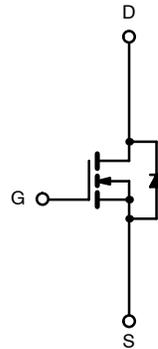
G D S

Top View

Ordering Information:

SUD40N08-16  
SUD40N08-16—E3 (Lead Free)

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	$V_{DS}$	80	V	
Gate-Source Voltage	$V_{GS}$	$\pm 20$		
Continuous Drain Current ( $T_J = 175^\circ\text{C}$ ) <sup>b</sup>	$I_D$	$T_C = 25^\circ\text{C}$	40	
		$T_C = 125^\circ\text{C}$	30	
Pulsed Drain Current	$I_{DM}$	60	A	
Continuous Source Current (Diode Conduction)	$I_S$	40		
Avalanche Current	$I_{AR}$	40		
Repetitive Avalanche Energy (Duty Cycle $\leq 1\%$ )	$L = 0.1$ mH	$E_{AR}$	80	mJ
Maximum Power Dissipation	$P_D$	$T_C = 25^\circ\text{C}$	136 <sup>b</sup>	W
		$T_A = 25^\circ\text{C}$	3 <sup>a</sup>	
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 <sup>a</sup>	$R_{thJA}$	$t \leq 10$ sec	15	$^\circ\text{C}/\text{W}$
		Steady State	40	
Junction-to-Case	$R_{thJC}$	0.85	1.1	

Notes

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

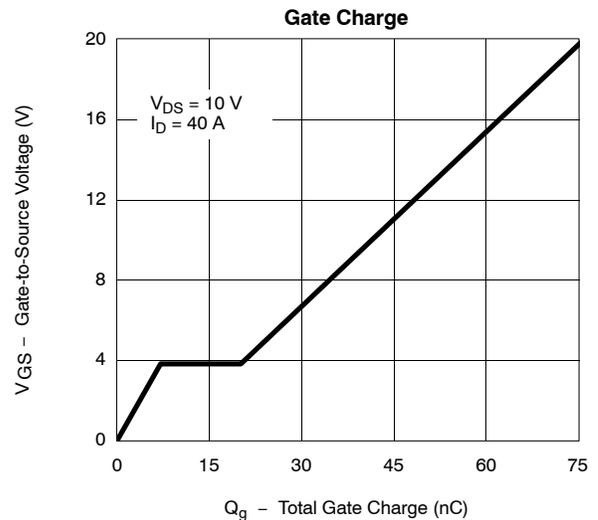
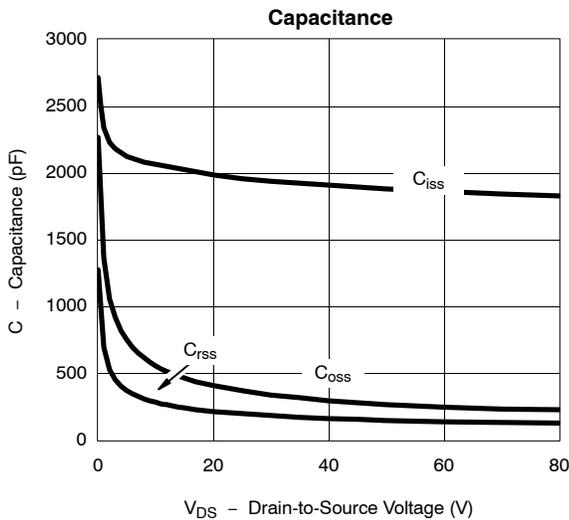
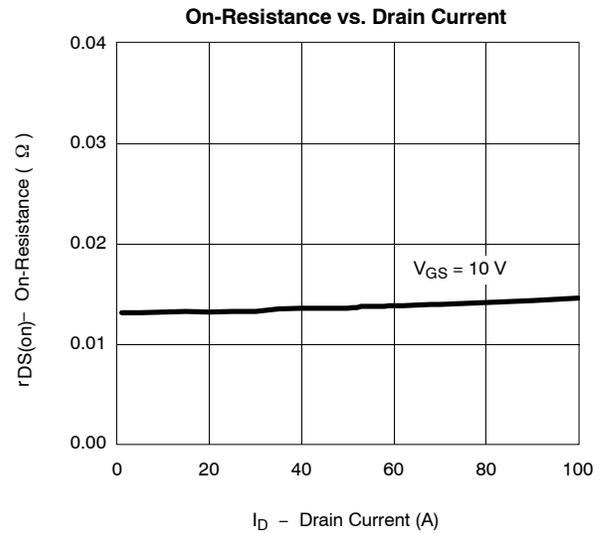
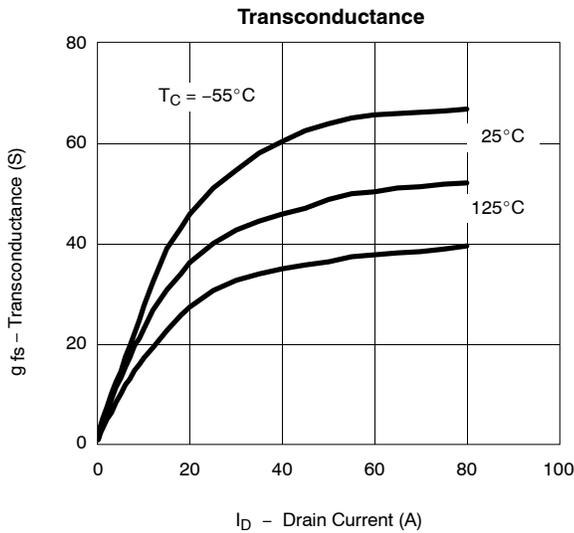
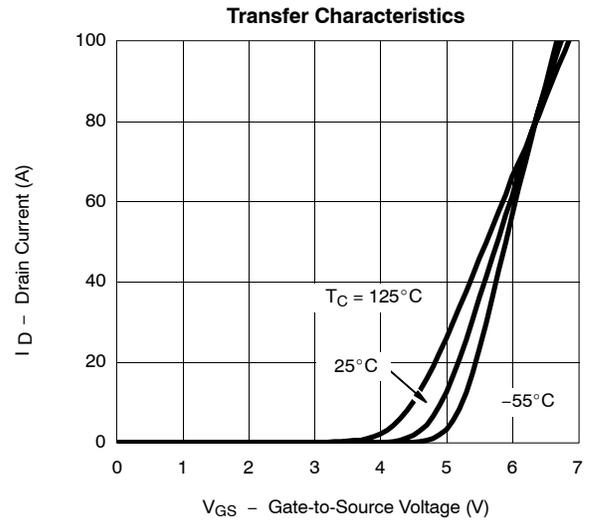
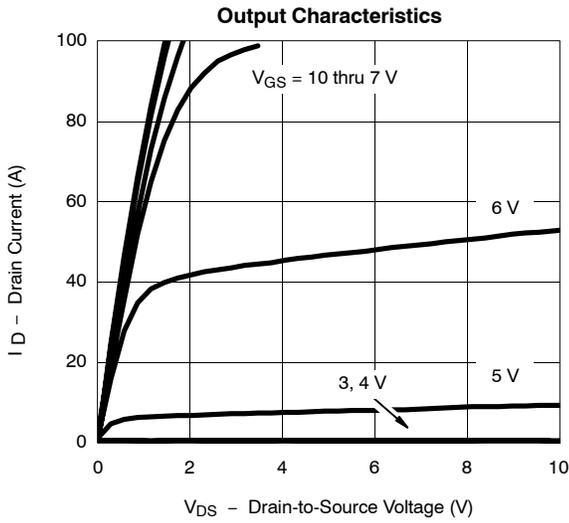
SPECIFICATIONS ( $T_J = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Condition	Min	Typ <sup>a</sup>	Max	Unit
<b>Static</b>						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0\text{ V}, I_D = 250\ \mu\text{A}$	80			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\ \mu\text{A}$	2.0		4.0	
Gate-Body Leakage	$I_{GSS}$	$V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$			$\pm 100$	nA
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 80\text{ V}, V_{GS} = 0\text{ V}$			1	$\mu\text{A}$
		$V_{DS} = 80\text{ V}, V_{GS} = 0\text{ V}, T_J = 125^\circ\text{C}$			50	
		$V_{DS} = 80\text{ V}, V_{GS} = 0\text{ V}, T_J = 175^\circ\text{C}$			250	
On-State Drain Current <sup>b</sup>	$I_{D(on)}$	$V_{DS} = 5\text{ V}, V_{GS} = 10\text{ V}$	60			A
Drain-Source On-State Resistance <sup>b</sup>	$r_{DS(on)}$	$V_{GS} = 10\text{ V}, I_D = 40\text{ A}$		0.013	0.016	$\Omega$
		$V_{GS} = 10\text{ V}, I_D = 40\text{ A}, T_J = 125^\circ\text{C}$			0.027	
		$V_{GS} = 10\text{ V}, I_D = 40\text{ A}, T_J = 175^\circ\text{C}$			0.037	
Forward Transconductance <sup>b</sup>	$g_{fs}$	$V_{DS} = 15\text{ V}, I_D = 40\text{ A}$		45		S
<b>Dynamic<sup>a</sup></b>						
Input Capacitance	$C_{iss}$	$V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, F = 1\text{ MHz}$		1960		pF
Output Capacitance	$C_{oss}$			370		
Reverse Transfer Capacitance	$C_{rss}$			200		
Total Gate Charge <sup>c</sup>	$Q_g$	$V_{DS} = 40\text{ V}, V_{GS} = 10\text{ V}, I_D = 40\text{ A}$		42	60	nC
Gate-Source Charge <sup>c</sup>	$Q_{gs}$			7		
Gate-Drain Charge <sup>c</sup>	$Q_{gd}$			13		
Gate Resistance	$R_g$		0.5		2.7	$\Omega$
Turn-On Delay Time <sup>c</sup>	$t_{d(on)}$	$V_{DD} = 40\text{ V}, R_L = 1.0\ \Omega$ $I_D = 40\text{ A}, V_{GEN} = 10\text{ V}, R_g = 2.5\ \Omega$		12	20	ns
Rise Time <sup>c</sup>	$t_r$			52	80	
Turn-Off Delay Time <sup>c</sup>	$t_{d(off)}$			25	38	
Fall Time <sup>c</sup>	$t_f$			10	15	
<b>Source-Drain Diode Ratings and Characteristic (<math>T_C = 25^\circ\text{C}</math>)</b>						
Pulsed Current	$I_{SM}$				60	A
Diode Forward Voltage <sup>b</sup>	$V_{SD}$	$I_F = 40\text{ A}, V_{GS} = 0\text{ V}$		1.0	1.5	V
Source-Drain Reverse Recovery Time	$t_{rr}$	$I_F = 40\text{ A}, di/dt = 100\text{ A}/\mu\text{s}$		45	70	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.

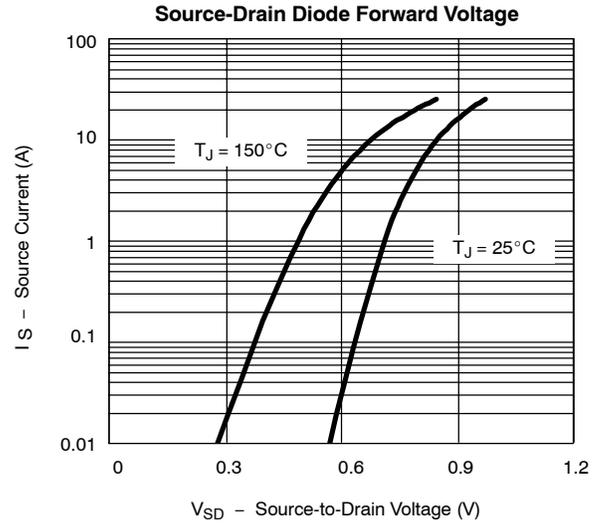
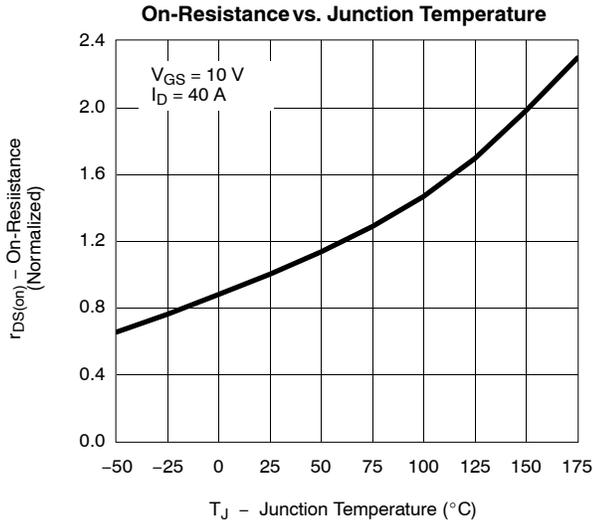


**TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)**

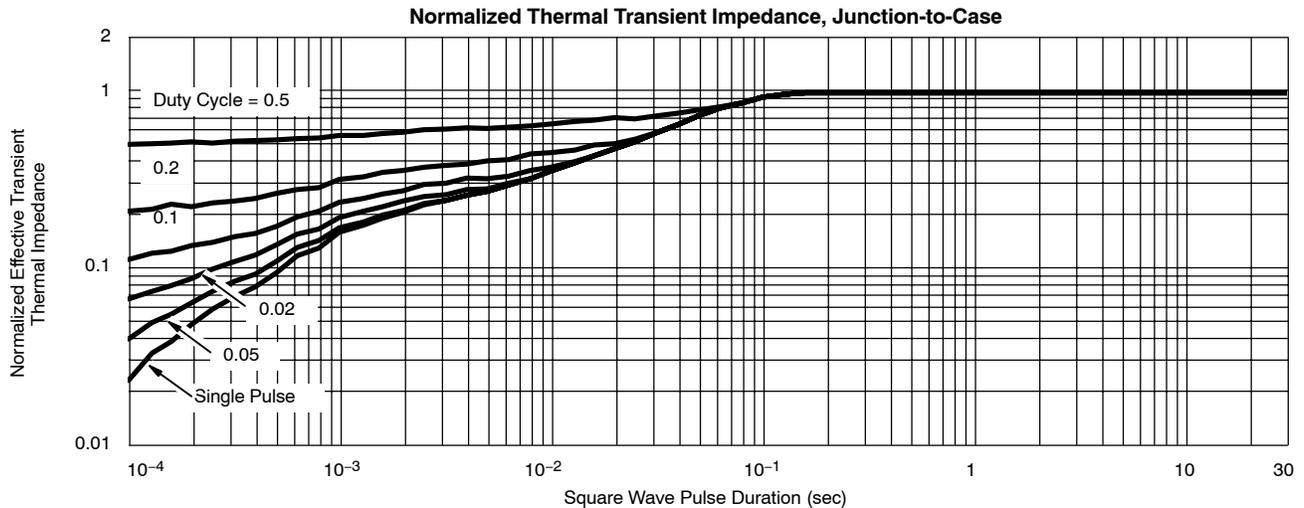
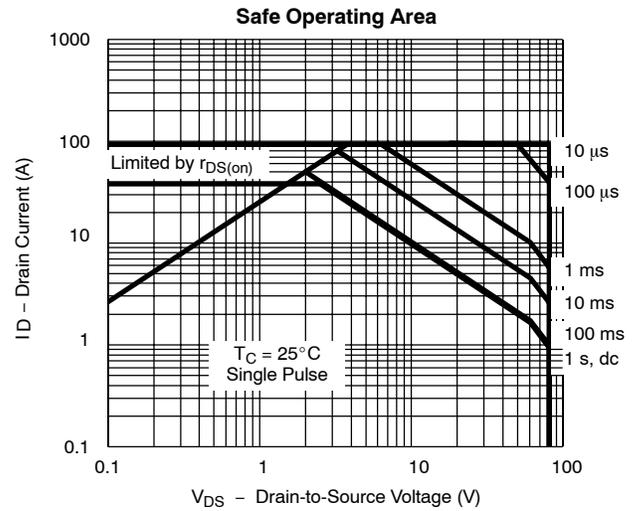
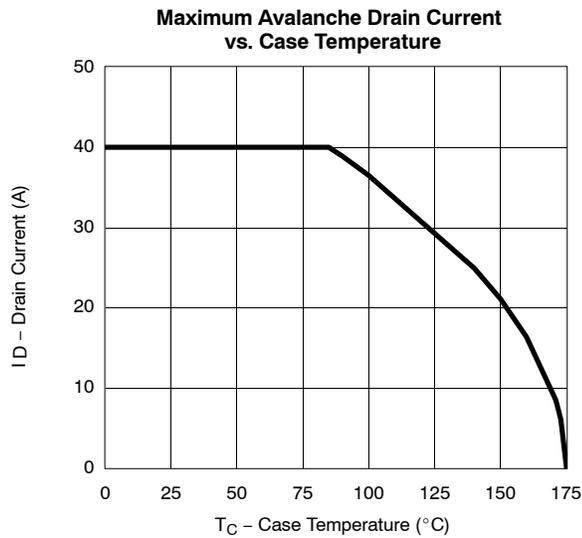




**TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)**



**THERMAL RATINGS**





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