

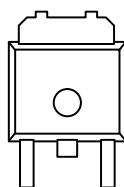


N-Channel 30-V (D-S) 175°C MOSFET

PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A) ^a
30	0.018 @ $V_{GS} = 10$ V	± 40
	0.027 @ $V_{GS} = 4.5$ V	± 34

175°C Rated
Maximum Junction Temperature
TrenchFET®
Power MOSFETs

TO-252

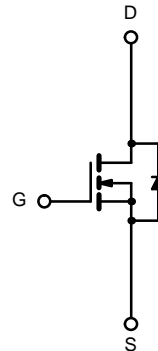


G D S

Top View

Order Number:
SUD40N03-18P

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}	30	V
Gate-Source Voltage	V_{GS}	± 20	
Continuous Drain Current ($T_J = 175^\circ\text{C}$) ^b	I_D	$T_C = 25^\circ\text{C}$	± 40
		$T_C = 100^\circ\text{C}$	± 28
Pulsed Drain Current	I_{DM}	± 100	A
Continuous Source Current (Diode Conduction) ^a	I_S	40	
Maximum Power Dissipation	P_D	$T_C = 25^\circ\text{C}$	62.5 ^c
		$T_A = 25^\circ\text{C}$	7.5 ^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	R_{thJA}	$t \leq 10$ sec	17	20	$^\circ\text{C/W}$
		Steady State	50	60	
Junction-to-Case	R_{thJC}	2	2.4		
Junction-to-Lead	R_{thJL}	4	4.8	$^\circ\text{C/W}$	

Notes

- a. Package Limited.
- b. Surface Mounted on 1" x 1" FR4 Board, $t \leq 10$ sec.
- c. 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	$V_{(BR)DSS}$	$V_{GS} = 0\text{ V}, I_D = 250\ \mu\text{A}$	30			V
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\ \mu\text{A}$	1.0			
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}	$V_{DS} = 24\text{ V}, V_{GS} = 0\text{ V}$			1	μA
		$V_{DS} = 24\text{ V}, V_{GS} = 0\text{ V}, T_J = 125^\circ\text{C}$			50	
On-State Drain Current ^b	$I_{D(on)}$	$V_{DS} = 5\text{ V}, V_{GS} = 10\text{ V}$	40			A
Drain-Source On-State Resistance ^b	$r_{DS(on)}$	$V_{GS} = 10\text{ V}, I_D = 20\text{ A}$		0.014	0.018	Ω
		$V_{GS} = 10\text{ V}, I_D = 20\text{ A}, T_J = 125^\circ\text{C}$			0.029	
		$V_{GS} = 4.5\text{ V}, I_D = 10\text{ A}$		0.021	0.027	
Forward Transconductance ^b	g_{fs}	$V_{DS} = 15\text{ V}, I_D = 20\text{ A}$	10			S
Dynamic^a						
Input Capacitance	C_{iss}	$V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, F = 1\text{ MHz}$		1300		pF
Output Capacitance	C_{oss}			340		
Reverse Transfer Capacitance	C_{rss}			95		
Total Gate Charge ^c	Q_g	$V_{DS} = 15\text{ V}, V_{GS} = 10\text{ V}, I_D = 40\text{ A}$		19	30	nC
Gate-Source Charge ^c	Q_{gs}			5		
Gate-Drain Charge ^c	Q_{gd}			3		
Turn-On Delay Time ^c	$t_{d(on)}$	$V_{DD} = 15\text{ V}, R_L = 0.37\ \Omega$ $I_D \cong 40\text{ A}, V_{GEN} = 10\text{ V}, R_G = 2.5\ \Omega$		8	12	ns
Rise Time ^c	t_r			8.5	13	
Turn-Off Delay Time ^c	$t_{d(off)}$			17	25	
Fall Time ^c	t_f			6	9	
Source-Drain Diode Ratings and Characteristic ($T_C = 25^\circ\text{C}$)						
Continuous Current	I_S				40	A
Pulsed Current	I_{SM}				80	
Diode Forward Voltage ^b	V_{SD}	$I_F = 100\text{ A}, V_{GS} = 0\text{ V}$			1.5	V
Source-Drain Reverse Recovery Time	t_{rr}	$I_F = 40\text{ A}, di/dt = 100\text{ A}/\mu\text{s}$		30	50	ns

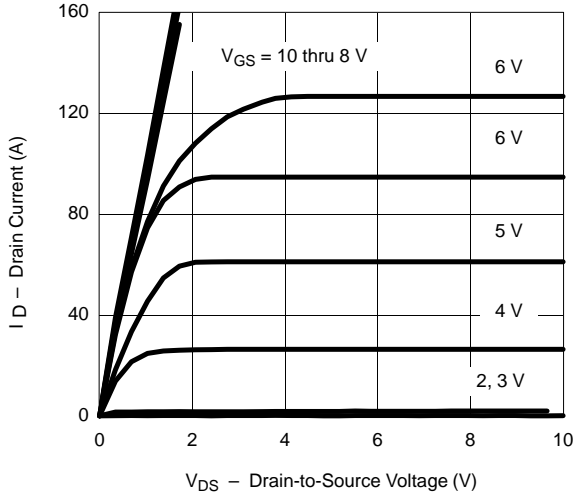
Notes

- 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.

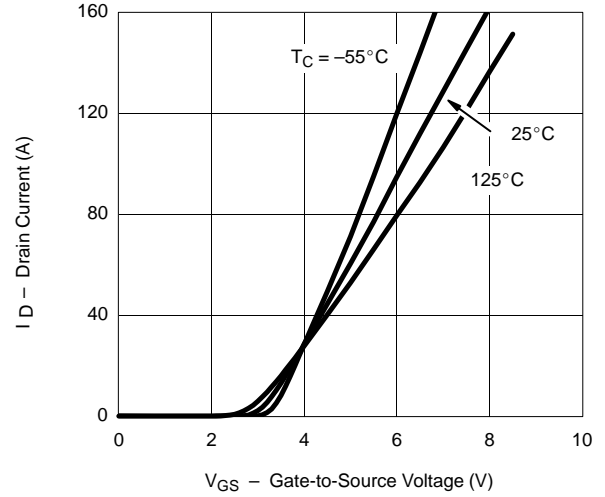


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

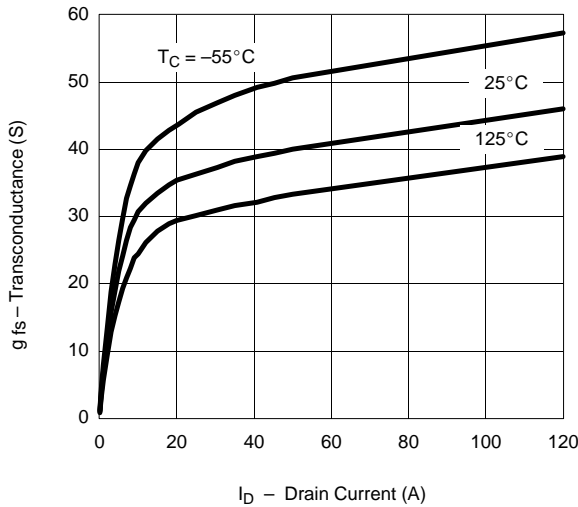
Output Characteristics



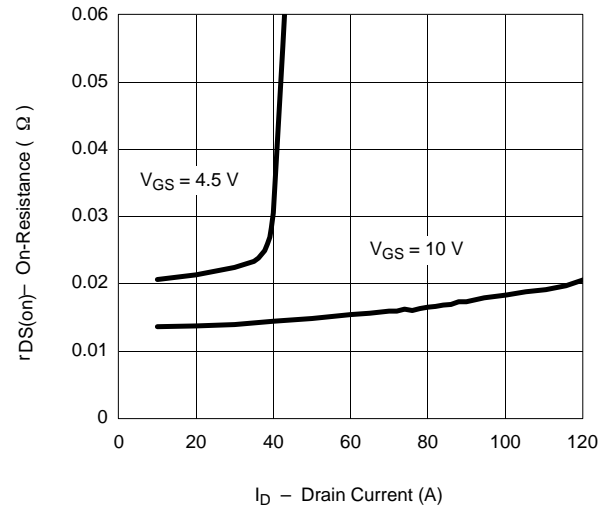
Transfer Characteristics



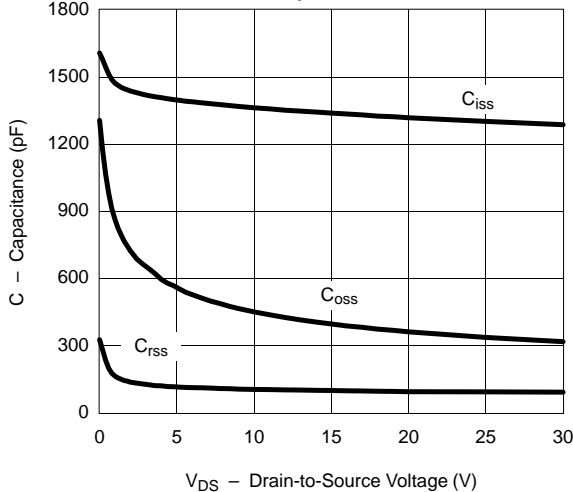
Transconductance



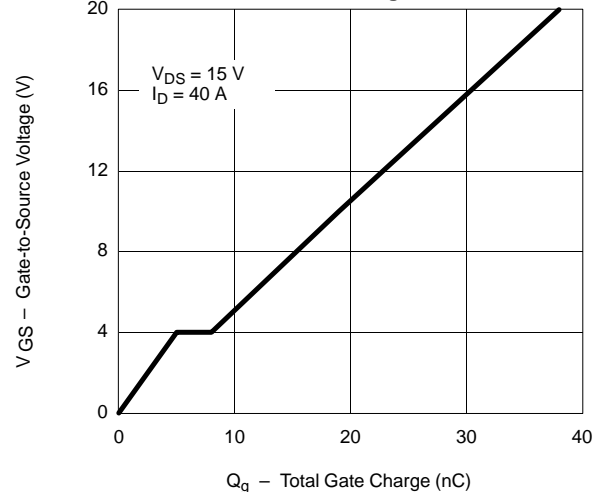
On-Resistance vs. Drain Current



Capacitance



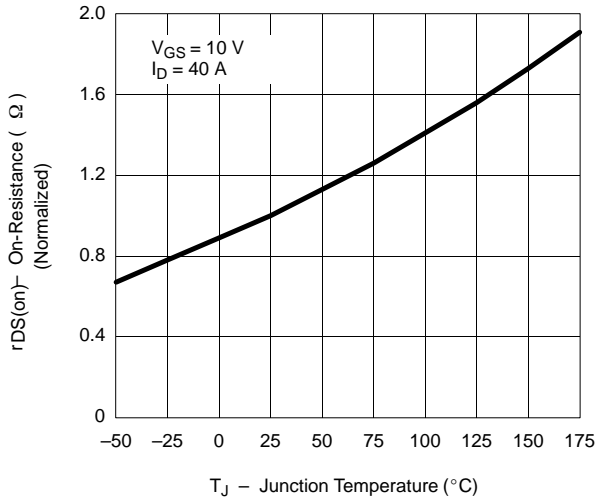
Gate Charge



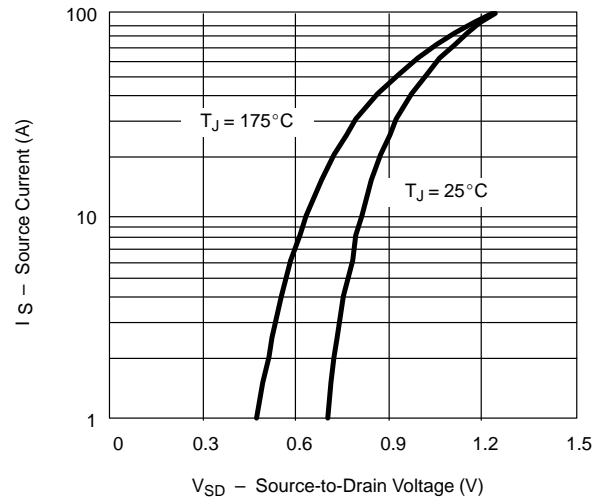


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

On-Resistance vs. Junction Temperature

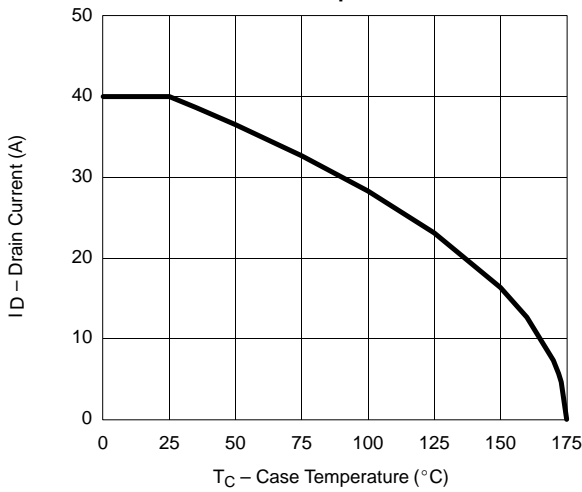


Source-Drain Diode Forward Voltage

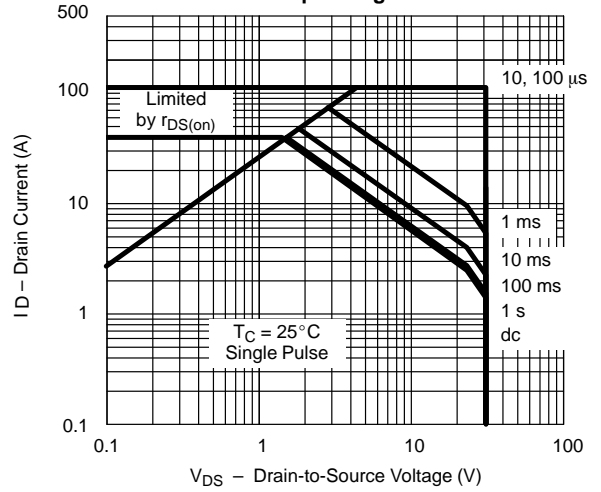


THERMAL RATINGS

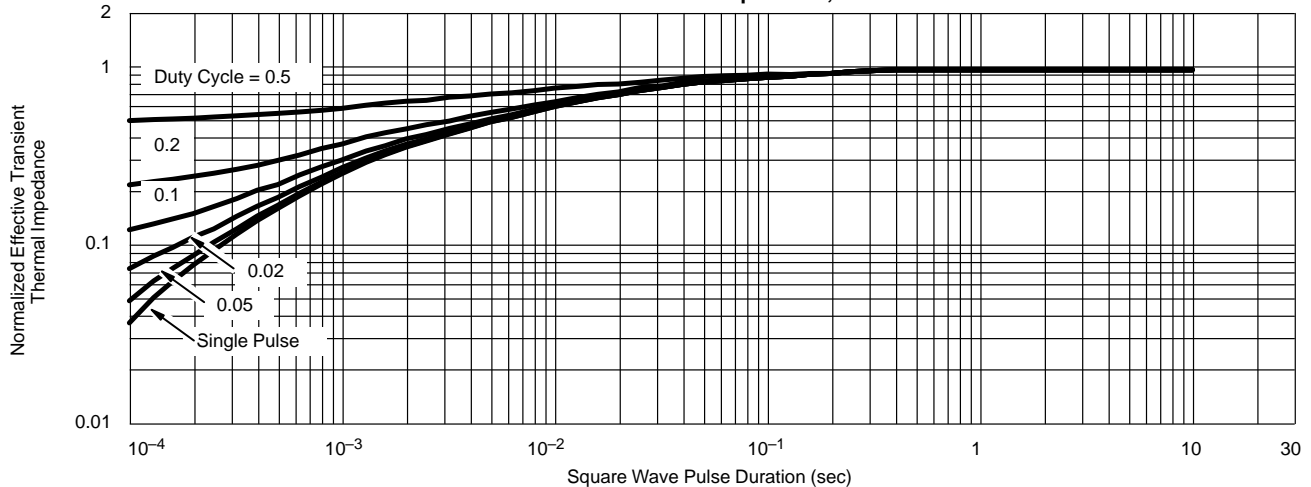
Maximum Avalanche Drain Current vs. Case Temperature



Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Case





Disclaimer

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