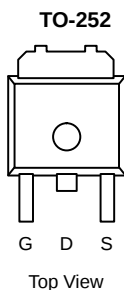




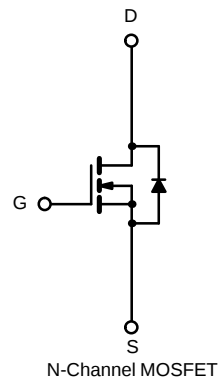
N-Channel 40-V (D-S), 175°C MOSFET

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

175°C Rated
Maximum Junction Temperature

Drain Connected to Tab

Order Number:
SUD30N04-10ABSOLUTE 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 ($T_J = 175^\circ\text{C}$)	$T_C = 25^\circ\text{C}$	I_D	30 ^a	A
	$T_C = 100^\circ\text{C}$		30 ^a	
Pulsed Drain Current		I_{DM}	120	
Avalanche Current		I_{AR}	50	mJ
Repetitive Avalanche Energy ^b	$L = 0.1$ mH	E_{AR}	125	
Power Dissipation	$T_C = 25^\circ\text{C}$	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	PCB Mount ^d	R_{thJA}	45	55	$^\circ\text{C/W}$
	Free Air		110	125	
Junction-to-Case		R_{thJC}	1.5	1.8	

Notes:

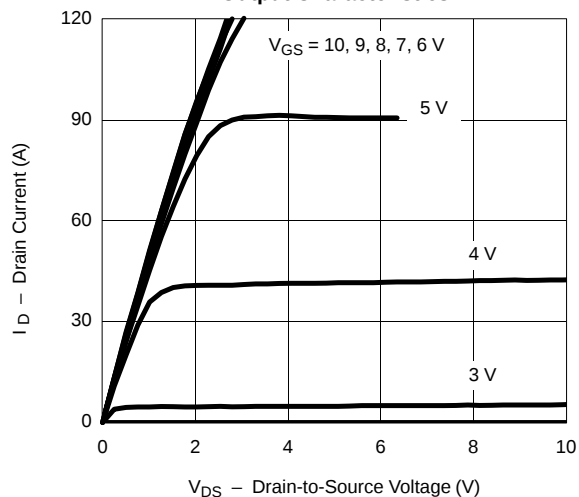
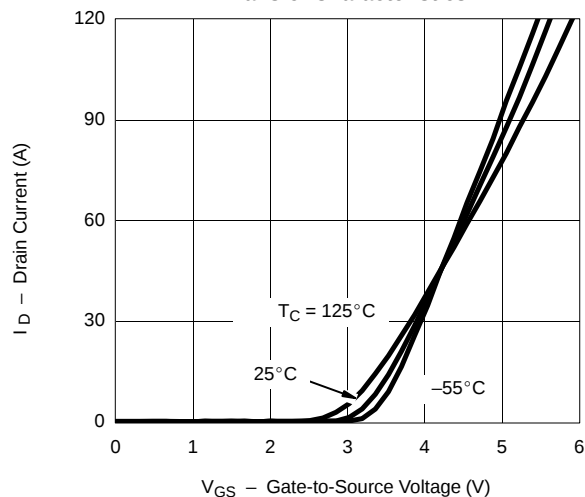
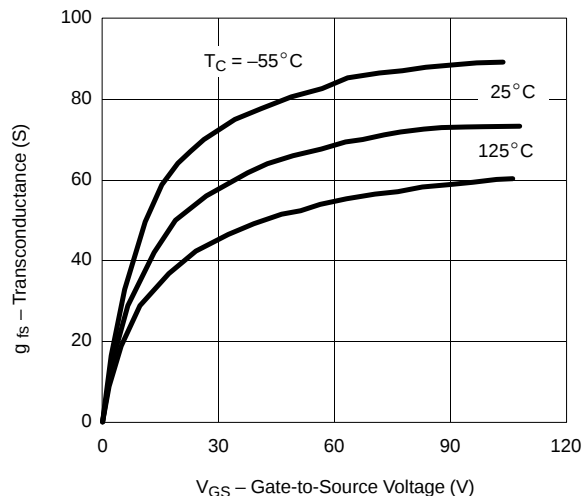
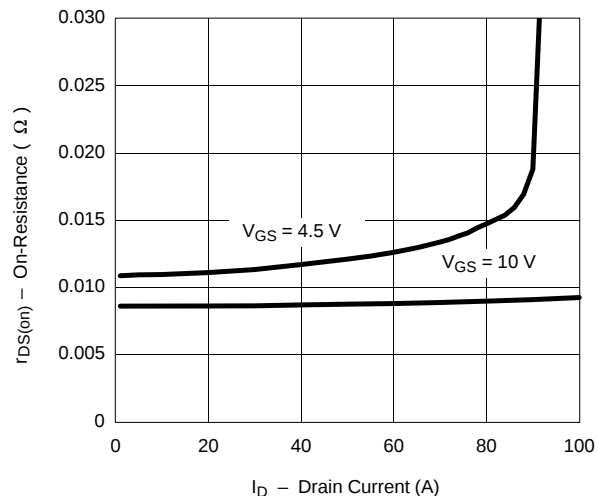
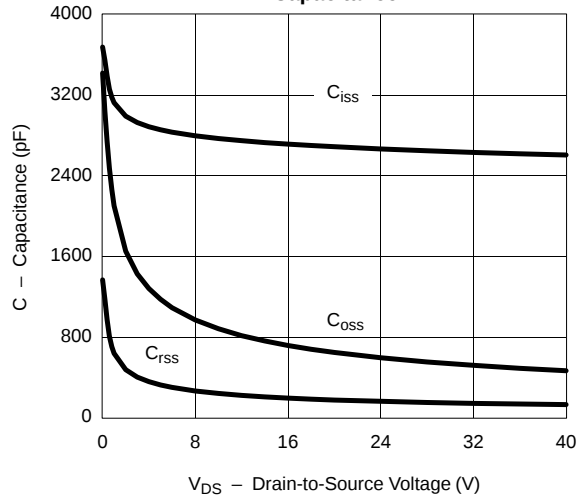
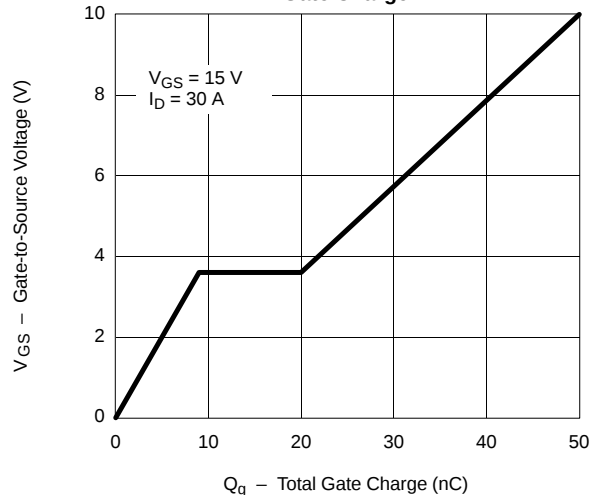
- Package limited.
- Duty cycle $\leq 1\%$.
- See SOA curve for voltage derating.
- Surface mounted on 1" FR4 board.

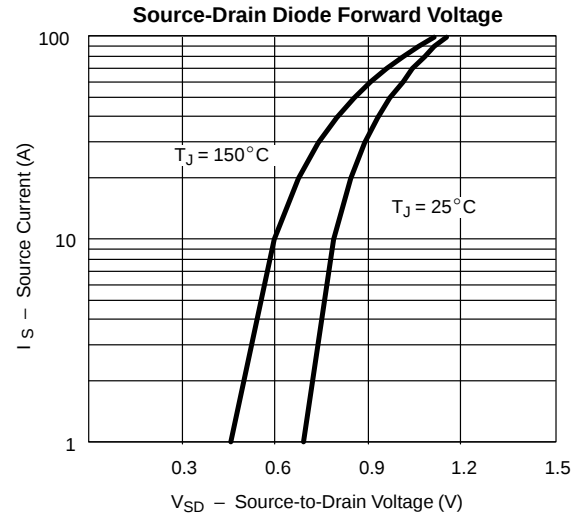
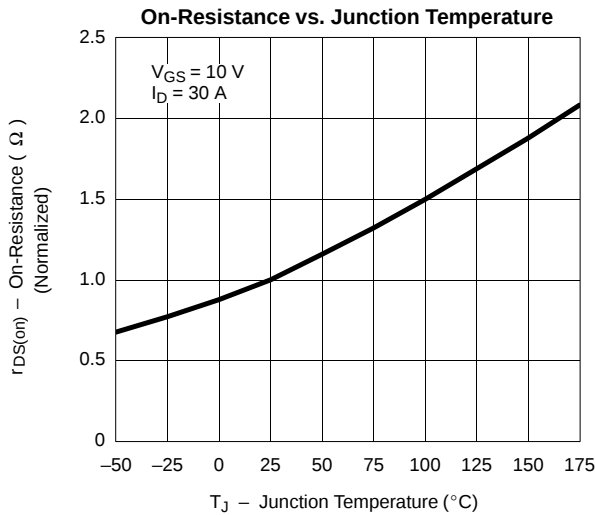
**SPECIFICATIONS ($T_J = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)**

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} = 0 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		
Reversen 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		
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:

- a. Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.
b. Guaranteed by design, not subject to production testing.
c. 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)**THERMAL RATINGS**