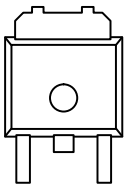
P-Channel 30-V (D-S) MOSFET

PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)[a]
–30	0.015 @ V_{GS} = –10 V	–15
	0.024 @ V_{GS} = –4.5 V	–12

TrenchFET® Power MOSFETs

TO-252

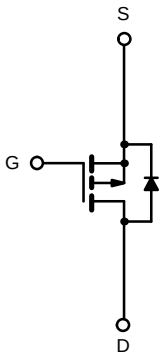


G D S

Top View

Drain Connected to Tab

Order Number:
SUD45P03-15A



P-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS (T_A = 25°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 = 150°C)[b]	T_A = 25°C	I_D	–15	A
	T_A = 100°C		–10	
Pulsed Drain Current		I_{DM}	–100	
Continuous Source Current (Diode Conduction)[a]		I_S	–15	
Maximum Power Dissipation	T_C = 25°C	P_D	70[c]	W
	T_A = 25°C		7[b]	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	–55 to 150	°C

THERMAL RESISTANCE RATINGS					
Parameter		Symbol	Typical	Maximum	Unit
Junction-to-Ambient[b]	t ≤ 10 sec	R_{thJA}	14	18	°C/W
	Steady State		40	50	
Junction-to-Case		R_{thJC}	1.5	1.8	

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

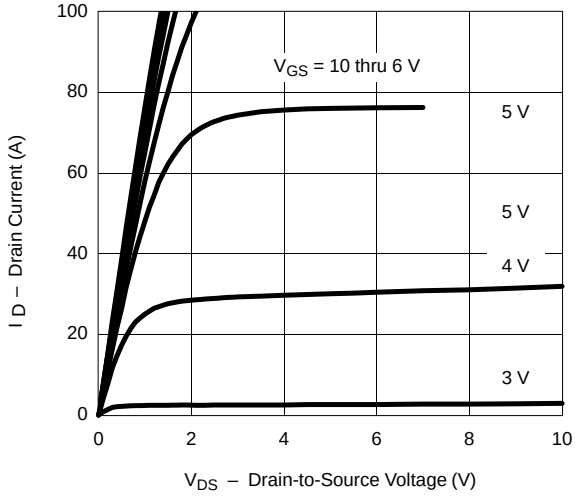
SPECIFICATIONS (T_J = 25°C UNLESS OTHERWISE NOTED)

Parameter	Symbol	Test Condition	Min	Typ[a]	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0 V, I_D = –250 μA	–30			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = –250 μA	–1.0			
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = –20 V			–100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = –30 V, V_{GS} = 0 V			–1	μA
		V_{DS} = –30 V, V_{GS} = 0 V, T_J = 125°C			–50	
On-State Drain Current[b]	$I_{D(on)}$	V_{DS} = –5 V, V_{GS} = –10 V	–50			A
		V_{DS} = –5 V, V_{GS} = –4.5 V	–20			
Drain-Source On-State Resistance[b]	$r_{DS(on)}$	V_{GS} = –10 V, I_D = –15 A		0.012	0.015	Ω
		V_{GS} = –10 V, I_D = –15 A, T_J = 125°C		0.018	0.026	
		V_{GS} = –4.5 V, I_D = –12 A		0.020	0.024	
Forward Transconductance[b]	g_{fs}	V_{DS} = –15 V, I_D = –15 A	20			S
Dynamic[a]						
Input Capacitance	C_{iss}	V_{GS} = 0 V, V_{DS} = –25 V, f = 1 MHz		3600		pF
Output Capacitance	C_{oss}			600		
Reverse Transfer Capacitance	C_{rss}			340		
Total Gate Charge[c]	Q_g	V_{DS} = –15 V, V_{GS} = –10 V, I_D = –45 A		60	125	nC
Gate-Source Charge[c]	Q_{gs}			14		
Gate-Drain Charge[c]	Q_{gd}			12		
Turn-On Delay Time[c]	$t_{d(on)}$	V_{DD} = –15 V, R_L = 0.33 Ω I_D ≅ –45 A, V_{GEN} = –10 V, R_G = 2.4 Ω		13	20	ns
Rise Time[c]	t_r			370	520	
Turn-Off Delay Time[c]	$t_{d(off)}$			50	100	
Fall Time[c]	t_f			75	120	
Source-Drain Diode Ratings and Characteristic (T_C = 25°C)						
Pulsed Current	I_{SM}				100	A
Diode Forward Voltage[b]	V_{SD}	I_F = –45 A, V_{GS} = 0 V		1.2	1.5	V
Source-Drain Reverse Recovery Time	t_{rr}	I_F = –45 A, di/dt = 100 A/μs		55	100	ns

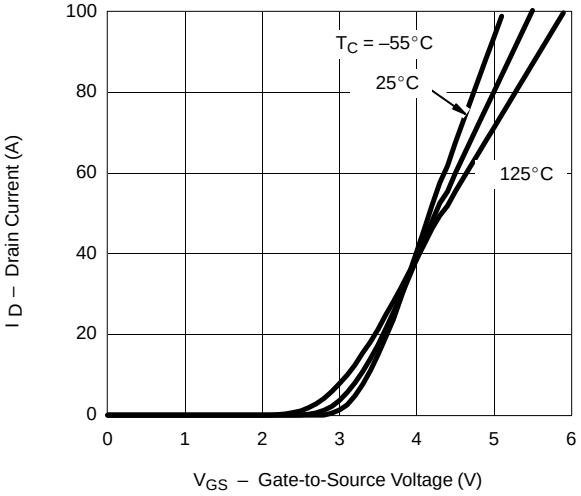
Notes
a. Guaranteed by design, not subject to production testing.
b. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.
c. Independent of operating temperature.

TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

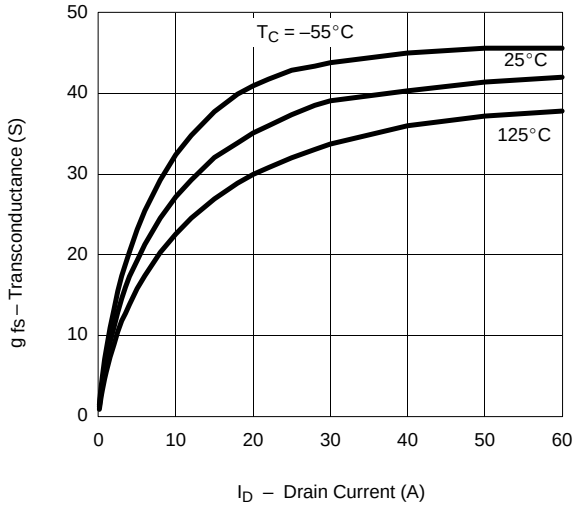
Output Characteristics



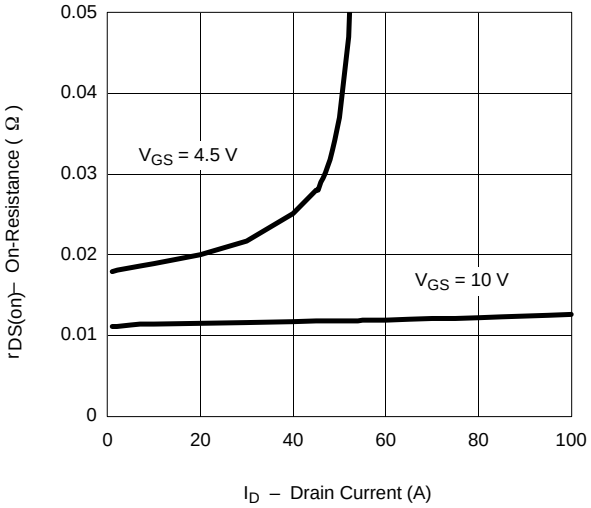
Transfer Characteristics



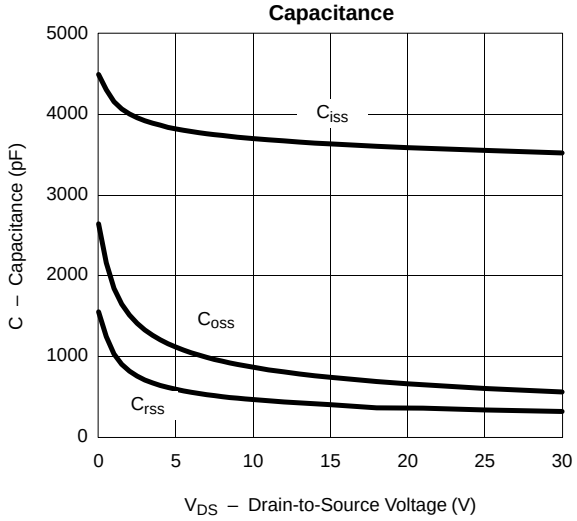
Transconductance



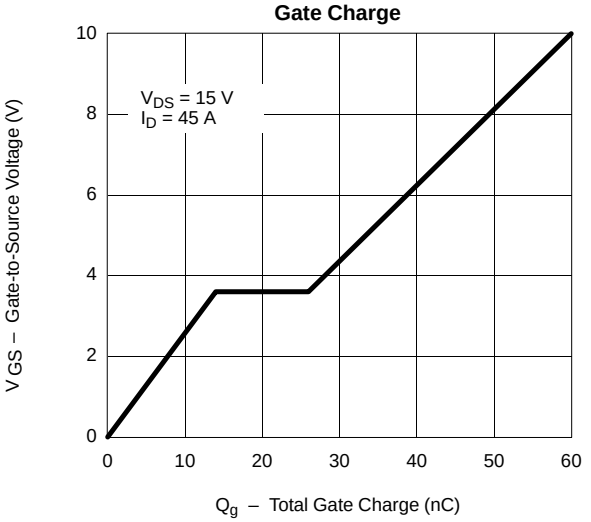
On-Resistance vs. Drain Current



Capacitance

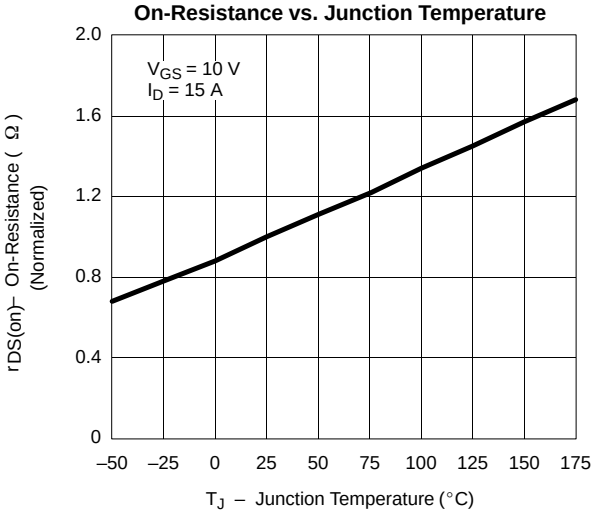


Gate Charge

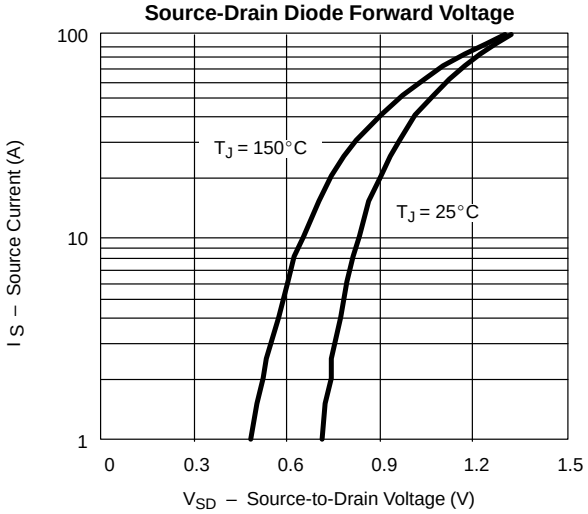


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

On-Resistance vs. Junction Temperature

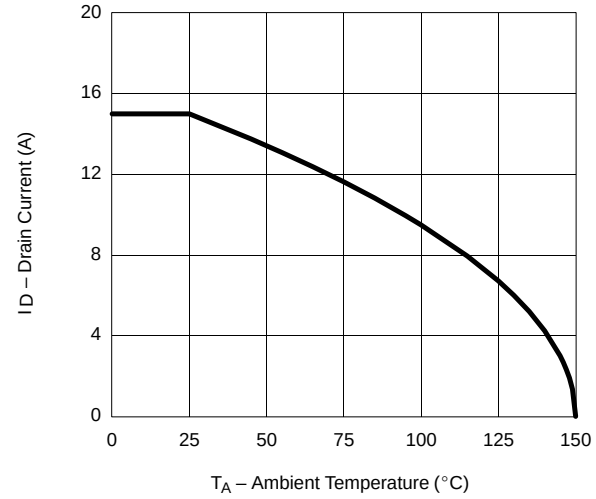


Source-Drain Diode Forward Voltage

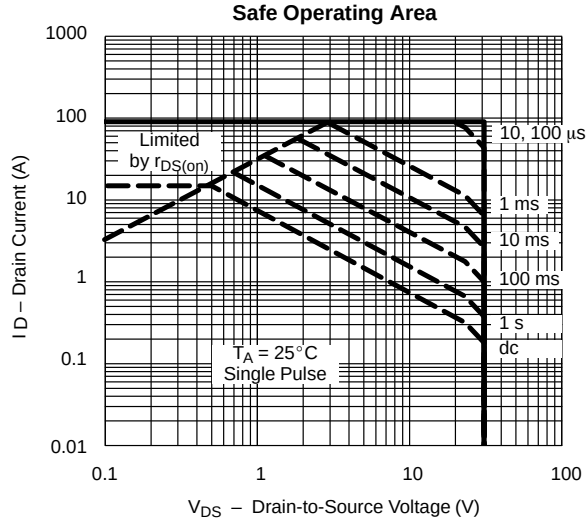


THERMAL RATINGS

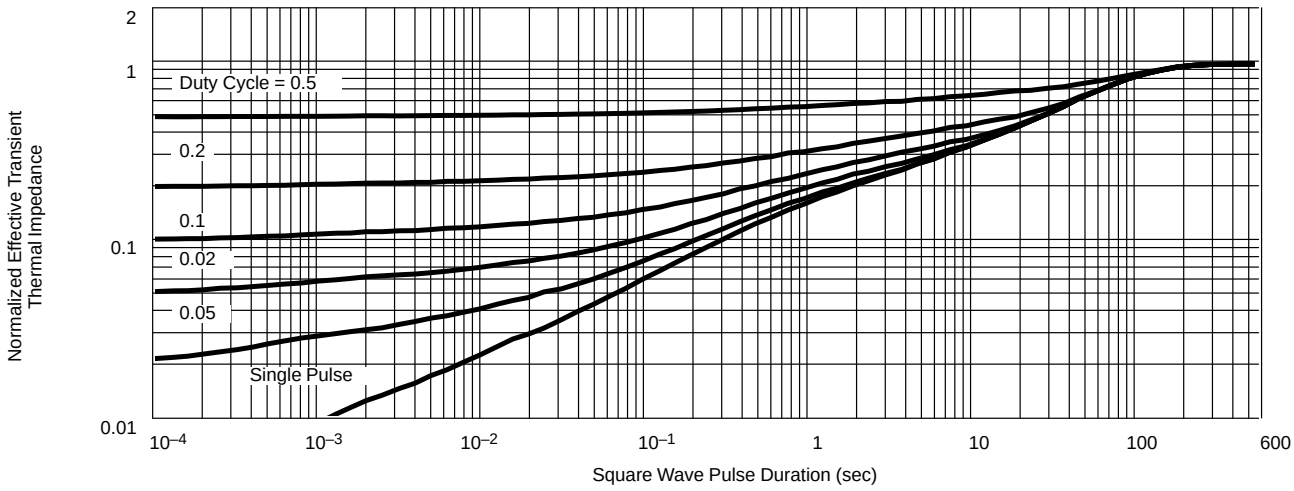
Maximum Drain Current vs. Ambiemt Temperature



Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Ambient



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