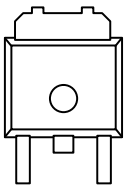
N-Channel 60-V (D-S), 175°C MOSFET, Logic Level

PRODUCT SUMMARY		
V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D (A)
60	0.035 @ V_{GS} = 10 V	25
	0.045 @ V_{GS} = 4.5 V	22

175°C Rated Maximum Junction Temperature TrenchFET® Power MOSFETs

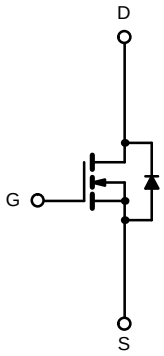
TO-252



Top View

Order Number:
SUD25N06-45L

Drain Connected to Tab



N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS (T_C = 25°C UNLESS OTHERWISE NOTED)				
Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	60	V
Gate-Source Voltage		V_{GS}	±20	
Continuous Drain Current (T_J = 175°C)	T_C = 25°C	I_D	25	A
	T_C = 100°C		16	
Pulsed Drain Current		I_{DM}	30	
Continuous Source Current (Diode Conduction)		I_S	25	
Avalanche Current		I_{AR}	25	
Repetitive Avalanche Energy (Duty Cycle ≤ 1%)	L = 0.1 mH	E_{AR}	31	mJ
Maximum Power Dissipation	T_C = 25°C	P_D	50	W
	T_A = 25°C		2.5[a]	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	–55 to 175	°C

THERMAL RESISTANCE RATINGS			
Parameter	Symbol	Limit	Unit
Maximum Junction-to-Ambient[a]	R_{thJA}	60	°C/W
Maximum Junction-to-Case	R_{thJC}	3.0	

Notes:
a. Surface mounted on 1" x 1" FR4 Board.

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	60			V
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 μA	1.0		3.0	
Gate-Body Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ±20 V			±100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 60 V, V_{GS} = 0 V			1	μA
		V_{DS} = 60 V, V_{GS} = 0 V, T_J = 125°C			50	
		V_{DS} = 60 V, V_{GS} = 0 V, T_J = 175°C			150	
On-State Drain Current[b]	$I_{D(on)}$	V_{DS} = 5 V, V_{GS} = 10V	20			A
Drain-Source On-State Resistance[b]	$r_{DS(on)}$	V_{GS} = 10 V, I_D = 12 A		0.025	0.035	Ω
		V_{GS} = 10 V, I_D = 12 A, T_J = 125°C		0.045	0.063	
		V_{GS} = 10 V, I_D = 12 A, T_J = 175°C		0.058	0.081	
		V_{GS} = 4.5 V, I_D = 12 A		0.036	0.045	
Forward Transconductance[b]	g_{fs}	V_{DS} = 15 V, I_D = 12 A	15	25		S
Dynamic						
Input Capacitance	C_{iss}	V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz		1320		pF
Output Capacitance	C_{oss}			210		
Reverse Transfer Capacitance	C_{rss}			56		
Total Gate Charge[c]	Q_g	V_{DS} = 30 V, V_{GS} = 10 V, I_D = 25 A		26	40	nC
Gate-Source Charge[c]	Q_{gs}			7.5		
Gate-Drain Charge[c]	Q_{gd}			4.5		
Turn-On Delay Time[c]	$t_{d(on)}$	V_{DD} = 30 V, R_L = 1.2 Ω I_D ≅ 25 A, V_{GEN} = 10 V, R_G = 7.5 Ω		10	20	ns
Rise Time[c]	t_r			10	20	
Turn-Off Delay Time[c]	$t_{d(off)}$			31	45	
Fall Time[c]	t_f			10	20	
Source-Drain Diode Ratings and Characteristics (T_C = 25°C)[a]						
Pulsed Current	I_{SM}				30	A
Diode Forward Voltage	V_{SD}	I_F = 25 A, V_{GS} = 0 V			1.5	V
Reverse Recovery Time	t_{rr}	I_F = 25 A, di/dt = 100 A/μs		60	90	ns
Reverse Recovery Charge	Q_{rr}			0.13		μC

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