TEMIC

Siliconix

SUD/SUU40N06-24

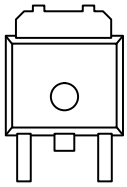
N-Channel Enhancement-Mode Transistors

Product Summary

V_{DS} (V)	$r_{DS(on)}$ (Ω)	I_D[a] (A)
60	0.024 @ V_{GS} = 10 V	37

175° C Rated
Maximum Junction Temperature
TrenchFET™
Power MOSFETs

TO-252



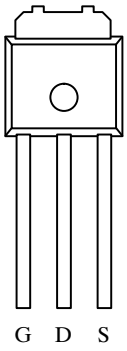
G D S

Top View

Order Number:
SUD40N06-24

Drain Connected to Tab

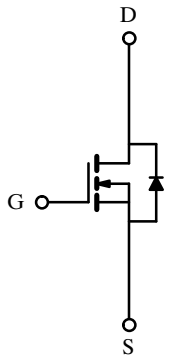
TO-251



G D S

Top View

Order Number:
SUU40N06-24



N-Channel MOSFET

Absolute Maximum Ratings (T_C = 25°C Unless Otherwise Noted)

Parameter		Symbol	Limit	Unit
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current (T_J = 175°C)[b]	T_C = 25°C	I_D	37	A
	T_C = 100°C		26	
Pulsed Drain Current		I_{DM}	100	
Continuous Source Current (Diode Conduction)		I_S	37	
Avalanche Current		I_{AR}	37	
Repetitive Avalanche Energy (Duty Cycle ≤ 1%)	L = 0.1 mH	E_{AR}	68	mJ
Maximum Power Dissipation	T_C = 25°C	P_D	75	W
	T_A = 25°C		2.5[b]	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	−55 to 175	°C

Thermal Resistance Ratings

Parameter	Symbol	Typical	Maximum	Unit
Maximum Junction-to-Ambient[b]	R_{thJA}		60	°C/W
Maximum Junction-to-Case	R_{thJC}		2.0	
Case-to-Sink	R_{thCS}	1.0		

Notes:
a. Calculated Rating for T_C = 25°C, for comparison purposes only. This cannot be used as continuous rating (see Absolute Maximum Ratings and Typical Characteristics).
b. Surface Mounted on FR4 Board, t ≤ 10 sec.

SUD/SUU40N06-24

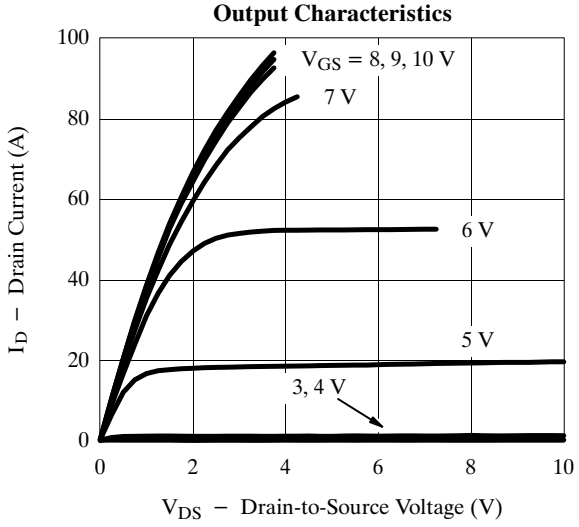
Specifications (T_J = 25°C Unless Otherwise Noted)

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 = 1 mA	2.0	3.0	4.0	
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} = 10 V	37			A
Drain-Source On-State Resistance[b]	$r_{DS(on)}$	V_{GS} = 10 V, I_D = 20 A		0.020	0.024	Ω
		V_{GS} = 10 V, I_D = 20 A, T_J = 125°C			0.044	
		V_{GS} = 10 V, I_D = 20 A, T_J = 175°C			0.054	
Forward Transconductance[b]	g_{fs}	V_{DS} = 15 V, I_D = 20 A				S
Dynamic						
Input Capacitance	C_{iss}	V_{GS} = 0 V, V_{DS} = 25 V, f = 1 MHz		1600		pF
Output Capacitance	C_{oss}			300		
Reverse Transfer Capacitance	C_{rss}			80		
Total Gate Charge[c]	Q_g	V_{DS} = 30 V, V_{GS} = 10 V, I_D = 40 A		29	50	nC
Gate-Source Charge[c]	Q_{gs}			8		
Gate-Drain Charge[c]	Q_{gd}			8		
Turn-On Delay Time[c]	$t_{d(on)}$	V_{DD} = 30 V, R_L = 0.8 Ω I_D ≅ 37 A, V_{GEN} = 10 V, R_G = 2.5 Ω		11	20	ns
Rise Time[c]	t_r			8	20	
Turn-Off Delay Time[c]	$t_{d(off)}$			21	40	
Fall Time[c]	t_f			7	18	
Source-Drain Diode Ratings and Characteristics (T_C = 25°C)						
Pulsed Current	I_{SM}				37	A
Diode Forward Voltage	V_{SD}	I_F = 37 A, V_{GS} = 0 V		1.0	1.5	V
Reverse Recovery Time	t_{rr}	I_F = 37 A, di/dt = 100 A/µs		50	100	ns

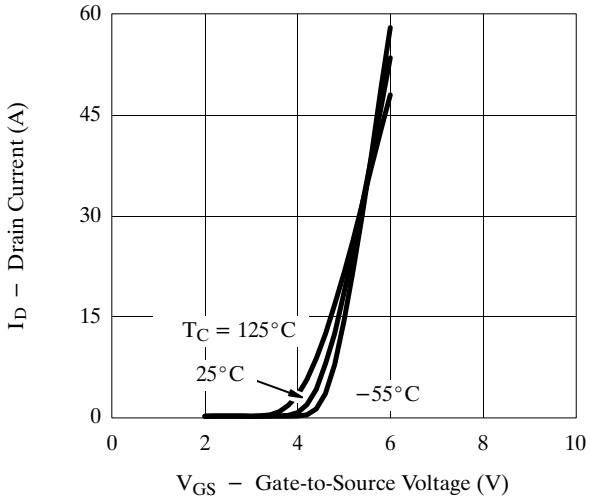
Notes:
a. For design aid only; not subject to production testing.
b. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2%.
c. Independent of operating temperature.

Typical Characteristics (25°C Unless Otherwise Noted)

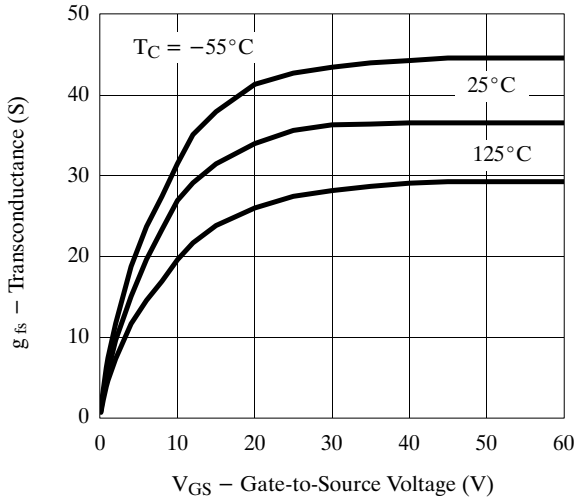
Output Characteristics



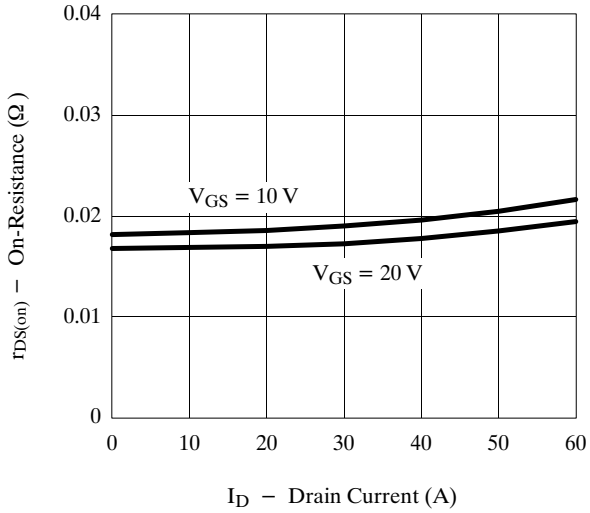
Transfer Characteristics



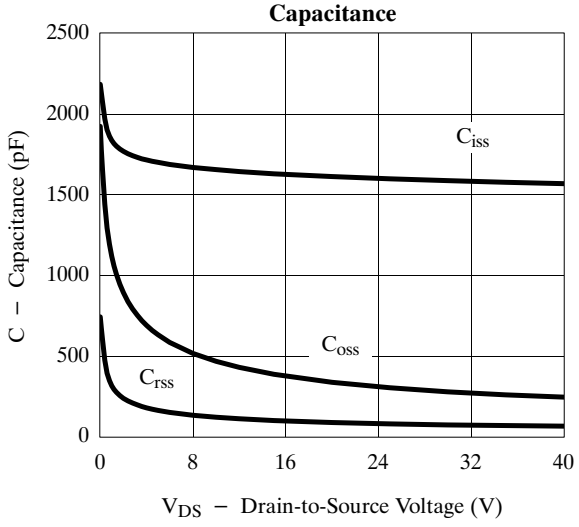
Transconductance



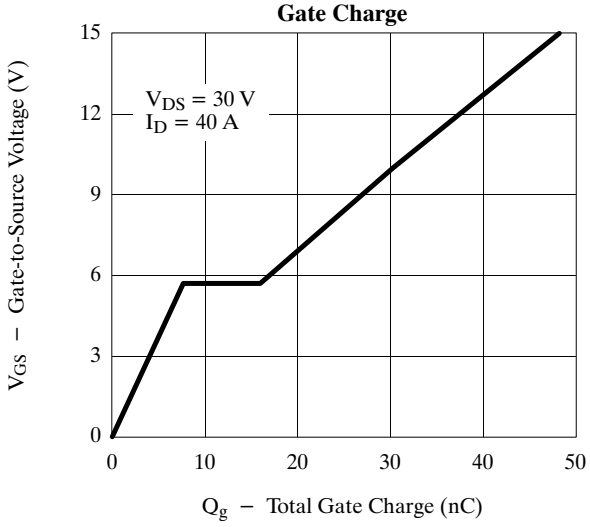
On-Resistance vs. Drain Current



Capacitance

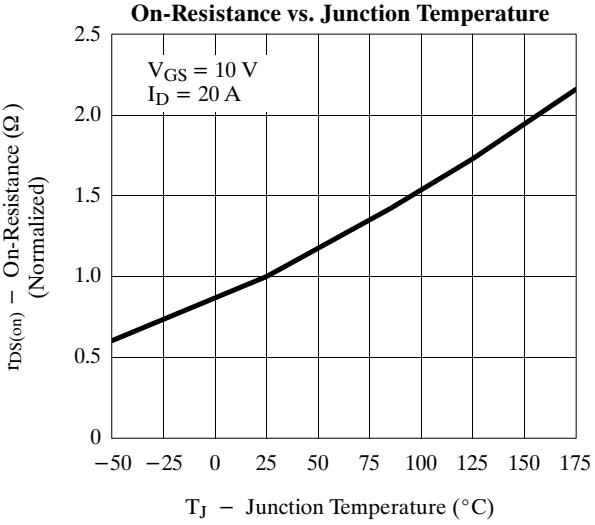


Gate Charge

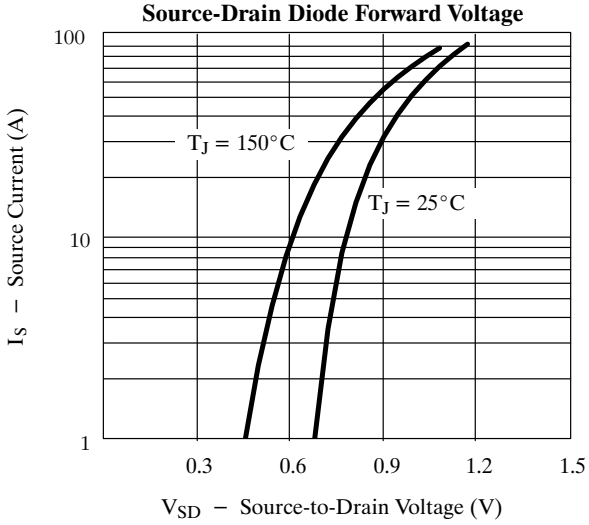


Typical Characteristics (25°C Unless Otherwise Noted)

On-Resistance vs. Junction Temperature

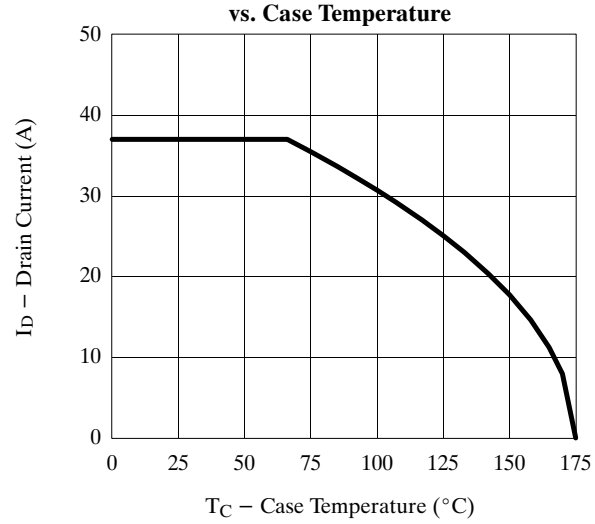


Source-Drain Diode Forward Voltage

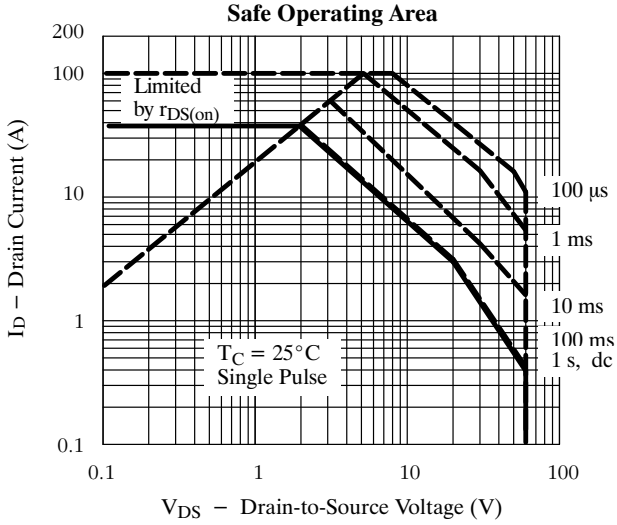


Thermal Ratings

Maximum Avalanche and Drain Current vs. Case Temperature



Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Case