

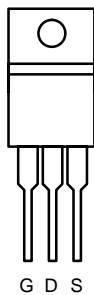


N-Channel 60-V (D-S), 175 °C MOSFET, Logic Level

175 °C Rated
Maximum Junction Temperature
TrenchFET®
Power MOSFETs

PRODUCT SUMMARY		
$V_{(BR)DSS}$ (V)	$r_{DS(on)}$ (Ω)	I_D (A)
60	0.022 @ $V_{GS} = 10$ V	40
	0.025 @ $V_{GS} = 4.5$ V	40

TO-220AB

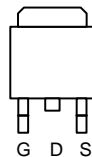


Top View

SUP40N06-25L

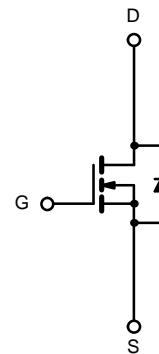
DRAIN connected to TAB

TO-263



Top View

SUB40N06-25L



N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS ($T_C = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)			
Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	± 20	
Continuous Drain Current ($T_J = 175^\circ\text{C}$)	I_D	$T_C = 25^\circ\text{C}$	40
		$T_C = 100^\circ\text{C}$	25
Pulsed Drain Current	I_{DM}	100	A
Avalanche Current	I_{AR}	40	
Repetitive Avalanche Energy ^a	E_{AR}	L = 0.1 mH	80
Power Dissipation		$T_C = 25^\circ\text{C}$ (TO-220AB and TO-263)	90 ^c
	$T_A = 25^\circ\text{C}$ (TO-263) ^c	3.7	
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55 to 175	$^\circ\text{C}$

THERMAL RESISTANCE RATINGS			
Parameter	Symbol	Limit	Unit
Junction-to-Ambient	R_{thJA}	PCB Mount (TO-263) ^c	40
		Free Air (TO-220AB)	80
Junction-to-Case	R_{thJC}	1.6	$^\circ\text{C}/\text{W}$

Notes:

- a. Duty cycle $\leq 1\%$.
- b. See SOA curve for voltage derating.
- c. Surface Mounted on FR4 Board, $t \leq 10$ sec.



SPECIFICATIONS (T _J = 25 °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	60			V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _{DS} = 250 μA	1.0	2.0	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 ^a	I _{D(on)}	V _{DS} = 5 V, V _{GS} = 10 V	40			A
Drain-Source On-State Resistance ^a	r _{DS(on)}	V _{GS} = 10 V, I _D = 20 A			0.022	Ω
		V _{GS} = 10 V, I _D = 20 A, T _J = 125 °C			0.043	
		V _{GS} = 10 V, I _D = 20 A, T _J = 175 °C			0.053	
		V _{GS} = 4.5 V, I _D = 20 A			0.025	
Forward Transconductance ^a	g _{fs}	V _{DS} = 15 V, I _D = 20 A				S
Dynamic^b						
Input Capacitance	C _{iss}	V _{GS} = 0 V, V _{DS} = 25 V, f = 1 MHz		1800		pF
Output Capacitance	C _{oss}			350		
Reverse Transfer Capacitance	C _{rss}			100		
Total Gate Charge ^c	Q _g	V _{DS} = 30 V, V _{GS} = 10 V, I _D = 40 A		40	60	nC
Gate-Source Charge ^c	Q _{gs}			9		
Gate-Drain Charge ^c	Q _{gd}			10		
Turn-On Delay Time ^c	t _{d(on)}	V _{DD} = 30 V, R _L = 0.8 Ω I _D = 40 A, V _{GEN} = 10 V, R _G = 2.5 Ω		10	20	ns
Rise Time ^c	t _r			9	20	
Turn-Off Delay Time ^c	t _{d(off)}			28	50	
Fall Time ^c	t _f			7	15	
Source-Drain Diode Ratings and Characteristics (T_C = 25 °C)^b						
Continuous Current	I _s				40	A
Pulsed Current	I _{SM}				100	
Forward Voltage ^a	V _{SD}	I _F = 40 A, V _{GS} = 0 V		1.0	1.5	V
Reverse Recovery Time	t _{rr}	I _F = 40 A, di/dt = 100 A/μs		48	100	ns
Peak Reverse Recovery Current	I _{RM(REC)}			6		A
Reverse Recovery Charge	Q _{rr}			0.15		μC

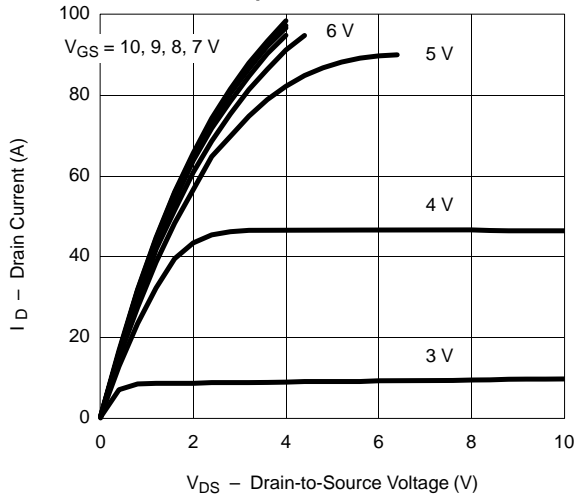
Notes:

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

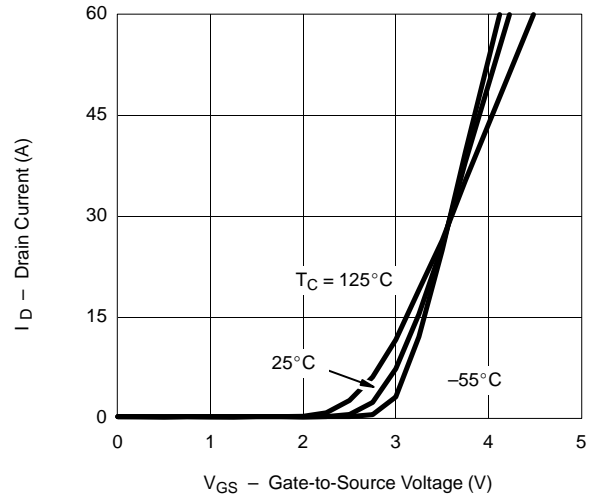


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

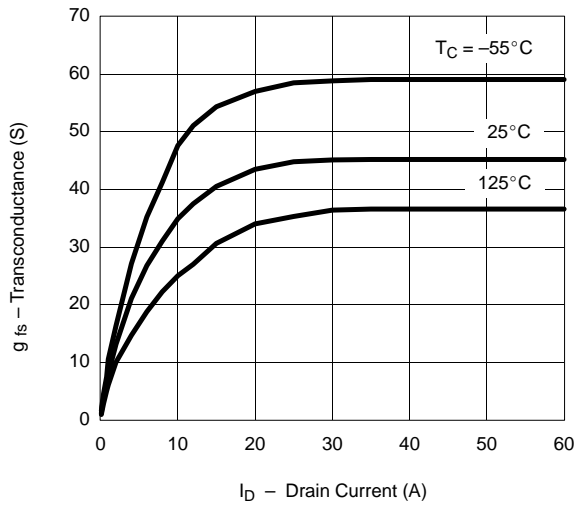
Output Characteristics



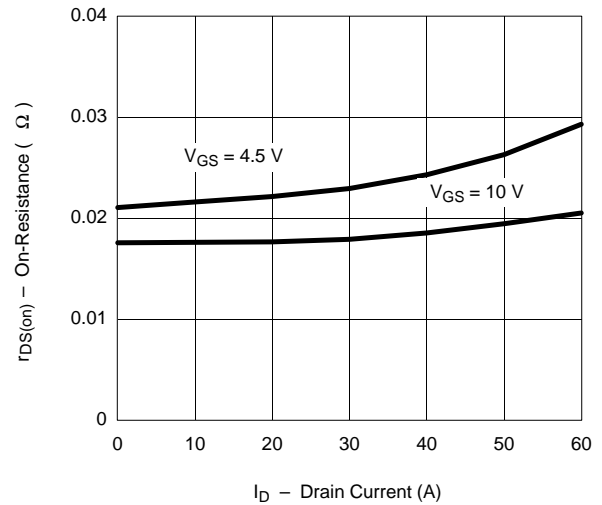
Transfer Characteristics



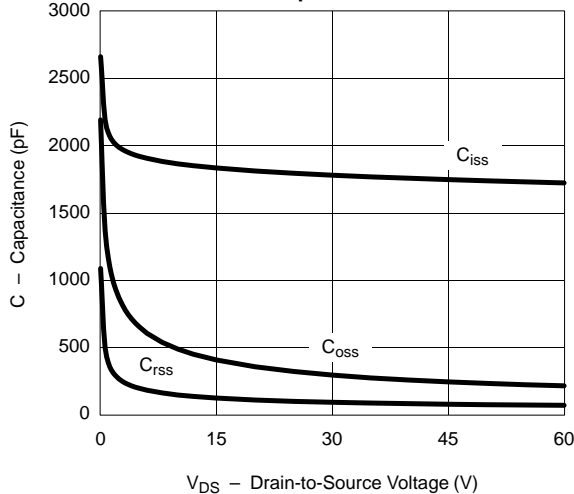
Transconductance



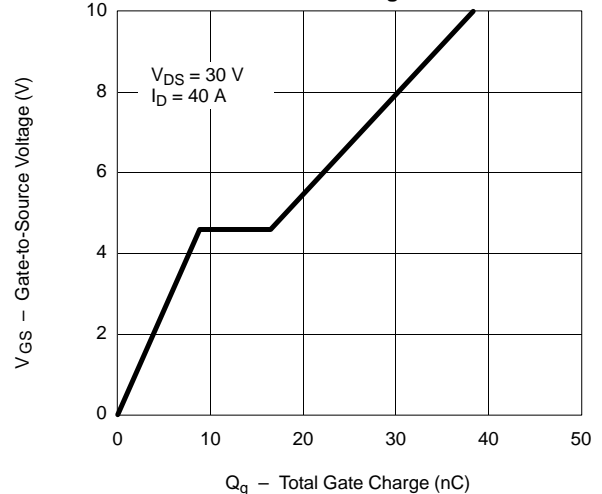
On-Resistance vs. Drain Current



Capacitance

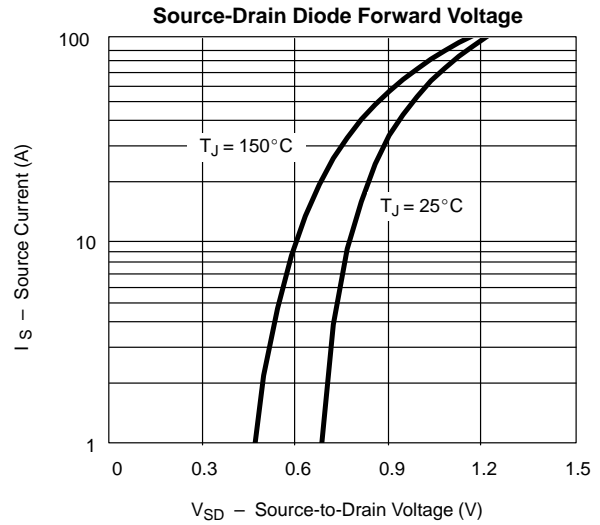
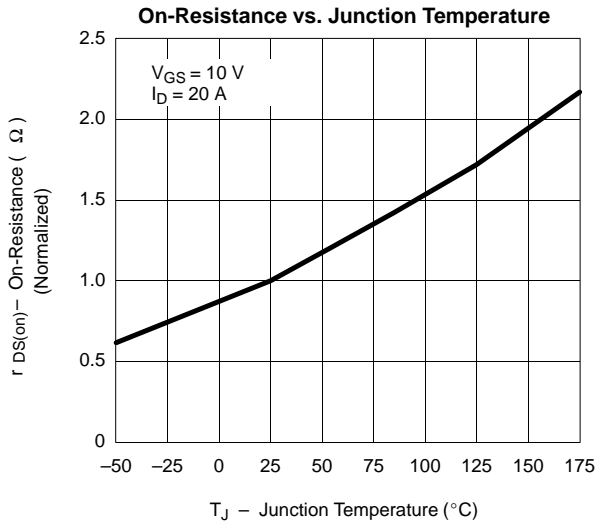


Gate Charge





TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)



THERMAL RATINGS

