

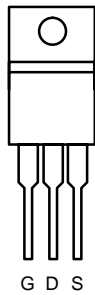


N-Channel 50-V (D-S), 175°C MOSFET, Logic Level

PRODUCT SUMMARY		
$V_{(BR)DSS}$ (V)	$r_{DS(on)}$ (Ω)	I_D (A)
50	0.018 @ $V_{GS} = 10$ V	$\pm 45^a$
	0.020 @ $V_{GS} = 4.5$ V	

175°C Rated
Maximum Junction Temperature
TrenchFET®
Power MOSFETs

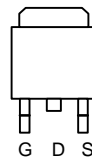
TO-220AB



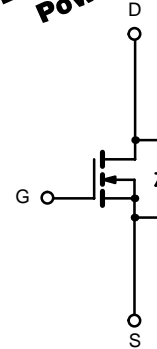
Top View
SUP45N05-20L

DRAIN connected to TAB

TO-263



Top View
SUB45N05-20L



N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS ($T_C = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)				
Parameter	Symbol	Limit	Unit	
Drain-Source Voltage	V_{DS}	50	V	
Gate-Source Voltage	V_{GS}	± 20		
Continuous Drain Current ($T_J = 175^\circ\text{C}$)	I_D	$T_C = 25^\circ\text{C}$	$\pm 45^a$	
		$T_C = 125^\circ\text{C}$	± 32	
Pulsed Drain Current	I_{DM}	± 100	A	
Continuous Source Current (Diode Conduction) ^a	I_S	± 45		
Avalanche Current	I_{AR}	± 45		
Repetitive Avalanche Energy ^b	E_{AR}	L = 0.1 mH	100	mJ
Maximum Power Dissipation				
		$T_A = 25^\circ\text{C}$ (TO-263) ^c	3.75	W
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) ^d	40
		Free Air (TO-220AB)	8.0
Junction-to-Case	R_{thJC}	1.6	$^\circ\text{C/W}$

Notes

- a. Package limited.
- b. Duty cycle $\leq 1\%$.
- c. See SOA curve for voltage derating.
- d. When mounted on 1" square PCB (FR-4 material).



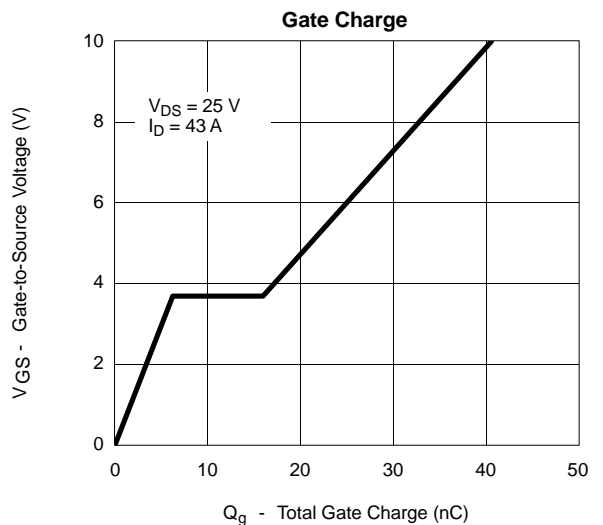
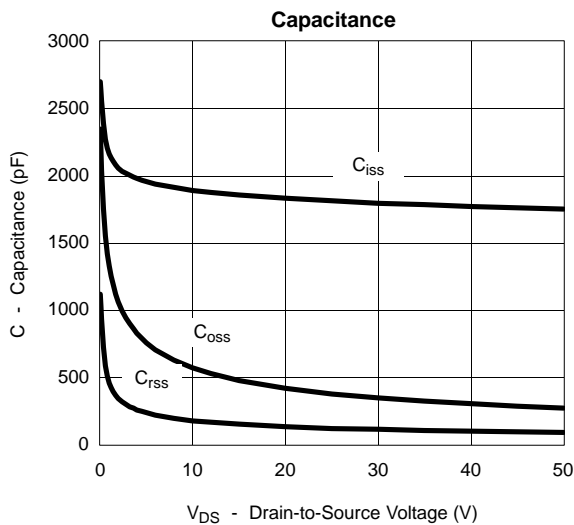
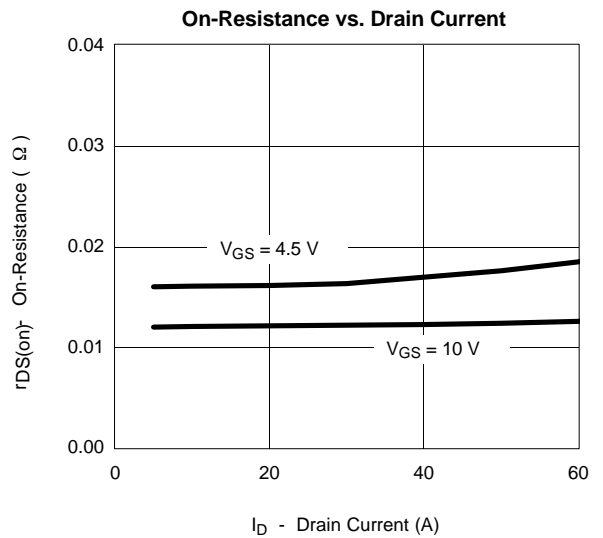
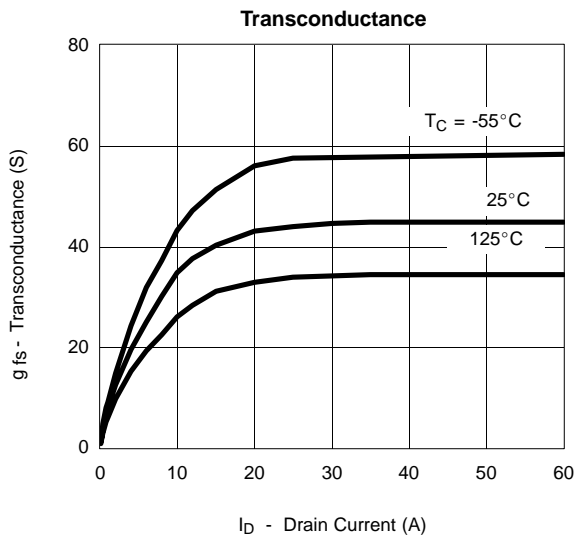
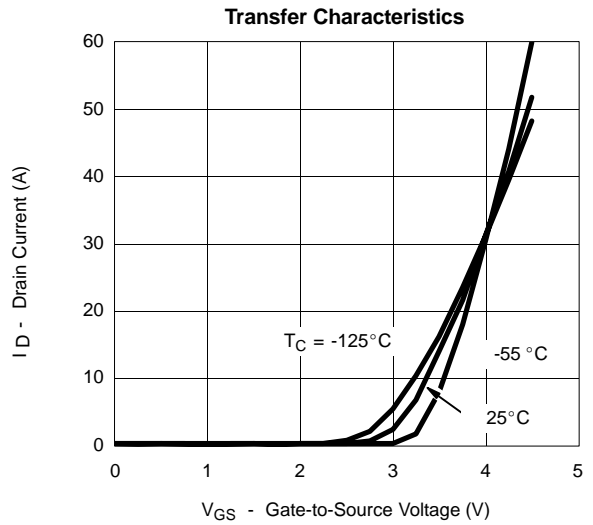
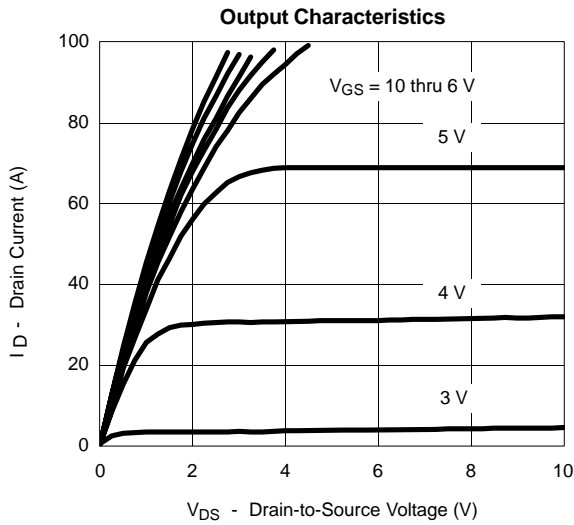
SPECIFICATIONS (T _J = 25 °C UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{DS} = 0 V, I _D = 250 μA	50			V
Gate-Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250 μA	1	2		
Gate-Body Leakage	I _{GSS}	V _{DS} = 0 V, V _{GS} = ±20 V			±100	nA
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 50 V, V _{GS} = 0 V			1	μA
		V _{DS} = 50 V, V _{GS} = 0 V, T _J = 125 °C			50	
		V _{DS} = 50 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	45			A
Drain-Source On-State Resistance ^a	r _{DS(on)}	V _{GS} = 10 V, I _D = 30 A			0.018	Ω
		V _{GS} = 10 V, I _D = 30 A, T _J = 125 °C			0.030	
		V _{GS} = 4.5 V, I _D = 45 A			0.020	
Forward Transconductance ^a	g _{fs}	V _{DS} = 15 V, I _D = 45 A	20			S
Dynamic^b						
Input Capacitance	C _{iss}	V _{GS} = 0 V, V _{DS} = 25 V, f = 1 MHz		1800	3600	pF
Output Capacitance	C _{oss}			370		
Reverse Transfer Capacitance	C _{rss}			130		
Total Gate Charge ^c	Q _g	V _{DS} = 25 V, V _{GS} = 10 V, I _D = 45 A		43	60	nC
Gate-Source Charge ^c	Q _{gs}			7		
Gate-Drain Charge ^c	Q _{gd}			10		
Turn-On Delay Time ^c	t _{d(on)}	V _{DD} = 25 V, R _L = 0.6 Ω I _D ≅ 45 A, V _{GEN} = 10 V, R _G = 2.5 Ω		10	20	ns
Rise Time ^c	t _r			10	20	
Turn-Off Delay Time ^c	t _{d(off)}			32	60	
Fall Time ^c	t _f			7	15	
Source-drain Diode Ratings and Characteristics (T_c = 25 °C)^b						
Pulsed Current	I _{SM}				43	A
Forward Voltage ^a	V _{SD}	I _F = 45 A, V _{GS} = 0 V			1.5	V
Reverse Recovery Time	t _{rr}	I _F = 45 A, di/dt = 100 A/μs		49	100	ns

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.

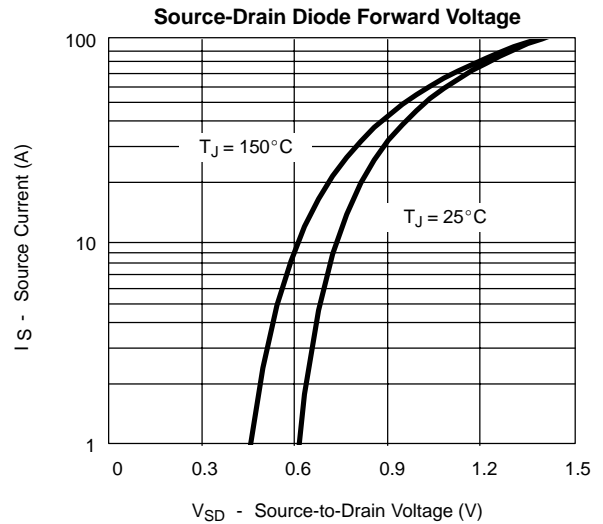
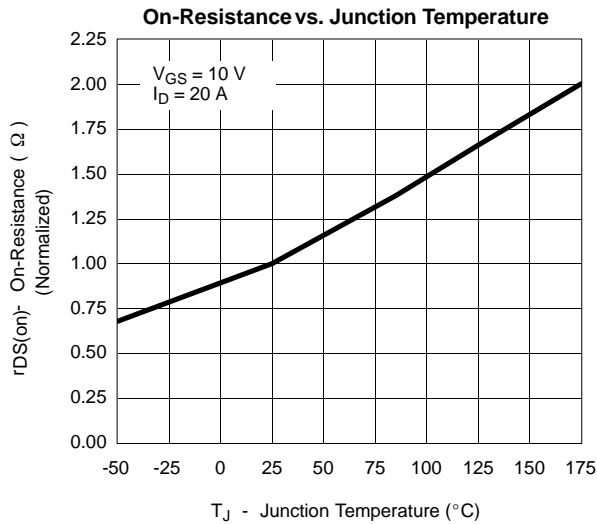


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

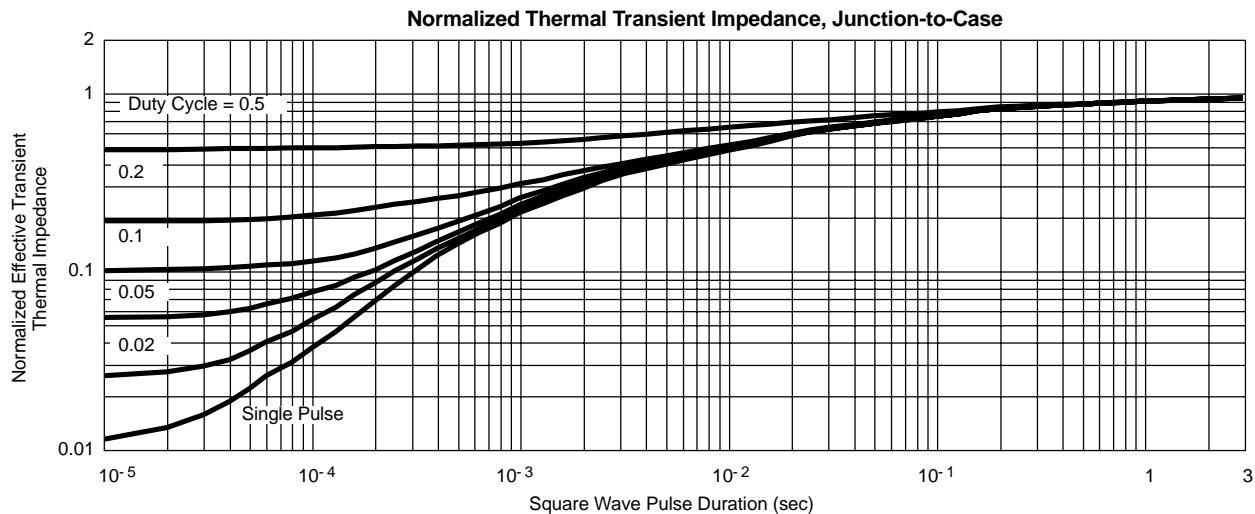
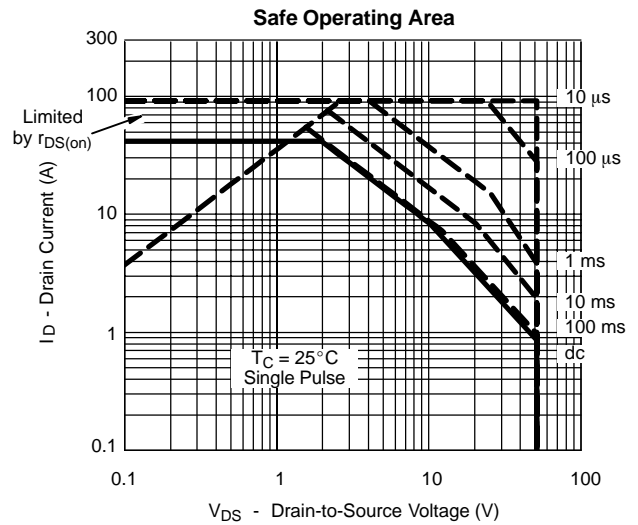
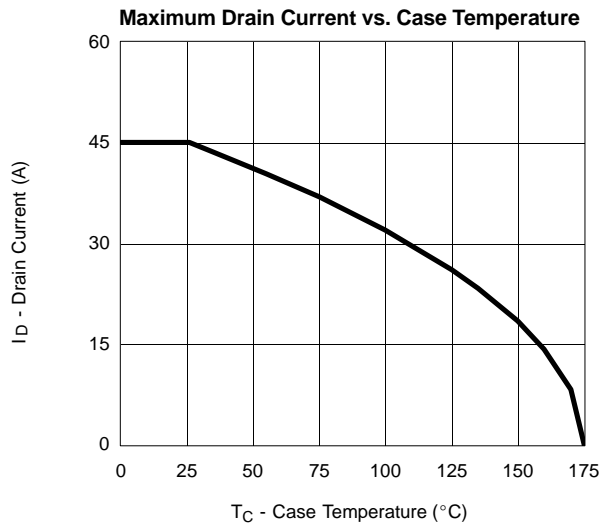




TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)



THERMAL RATINGS





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