



N-Channel 30-V (D-S), 175°C MOSFET

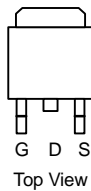
PRODUCT SUMMARY

$V_{(BR)DSS}$ (V)	$r_{DS(on)}$ (Ω)	I_D (A)
30	0.013 @ $V_{GS} = 10$ V	45 ^a
	0.02 @ $V_{GS} = 4.5$ V	45 ^a

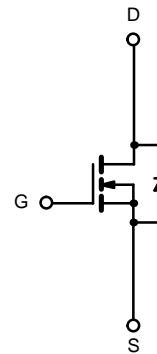
FEATURES

- TrenchFET® Power MOSFETS
- 175°C Junction Temperature

TO-263



SUB45N03-13L



N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS ($T_C = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)

Parameter	Symbol	Limit	Unit	
Drain-Source Voltage	V_{DS}	30	V	
Gate-Source Voltage	V_{GS}	± 20		
Continuous Drain Current ($T_J = 175^\circ\text{C}$)	I_D	$T_C = 25^\circ\text{C}$	45 ^a	A
		$T_C = 125^\circ\text{C}$	34 ^a	
Pulsed Drain Current	I_{DM}	100		
Avalanche Current	I_{AR}	45		
Repetitive Avalanche Energy ^b	E_{AR}	L = 0.1 mH	100	mJ
Maximum Power Dissipation ^b			$T_C = 25^\circ\text{C}$	88 ^c
	$T_A = 25^\circ\text{C}^d$	3.75		
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}	40	$^\circ\text{C/W}$
Junction-to-Case (Drain)			

Notes

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

For SPICE model information via the Worldwide Web: <http://www.vishay.com/www/product/spice.htm>

MOSFET 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	30			V
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _{DS} = 250 μA	1		3	
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	
		V _{DS} = 30 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 = 45 A		0.009	0.013	Ω
		V _{GS} = 10 V, I _D = 45 A, T _J = 125 °C		0.013	0.02	
		V _{GS} = 10 V, I _D = 45 A, T _J = 175 °C		0.02	0.026	
		V _{GS} = 4.5 V, I _D = 20 A		0.0145	0.02	
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		2000		pF
Output Capacitance	C _{oss}			370		
Reverse Transfer Capacitance	C _{rss}			180		
Total Gate Charge ^c	Q _g	V _{DS} = 15 V, V _{GS} = 10 V, I _D = 45 A		40	70	nC
Gate-Source Charge ^c	Q _{gs}			7.5		
Gate-Drain Charge ^c	Q _{gd}			8		
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 = 2.5 Ω		11	20	ns
Rise Time ^c	t _r			9	20	
Turn-Off Delay Time ^c	t _{d(off)}			38	70	
Fall Time ^c	t _f			11	20	
Source-Drain Diode Ratings and Characteristics (T_C = 25 °C)^b						
Continuous Current	I _S				45	A
Pulsed Current	I _{SM}				100	
Forward Voltage ^a	V _{SD}	I _F = 45 A, V _{GS} = 0 V		1	1.3	V
Reverse Recovery Time	t _{rr}	I _F = 45 A, di/dt = 100 A/μs		35	70	ns
Peak Reverse Recovery Current	I _{RM(REC)}			1.7		A
Reverse Recovery Charge	Q _{rr}			0.03		μC

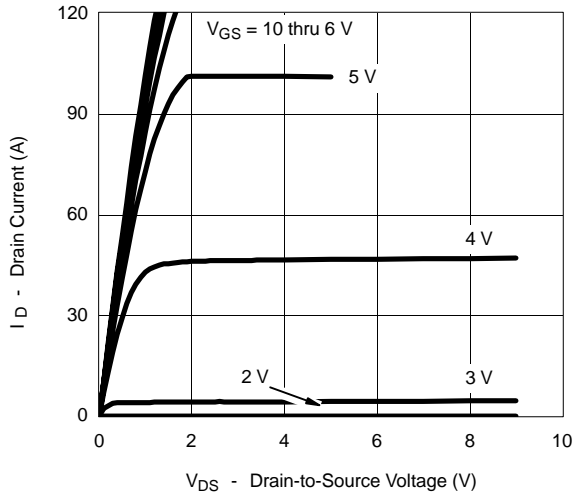
Notes:

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

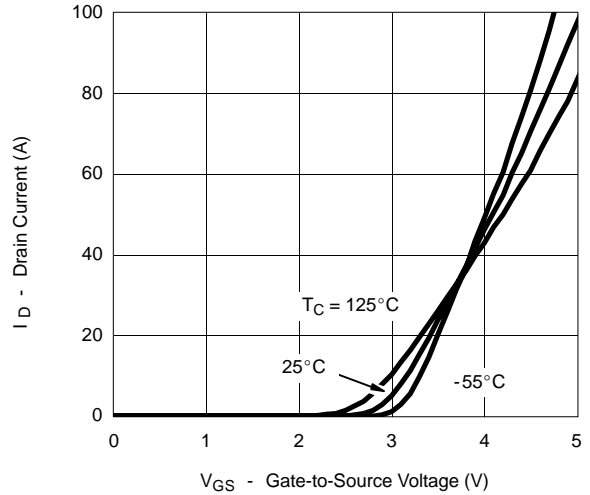


TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)

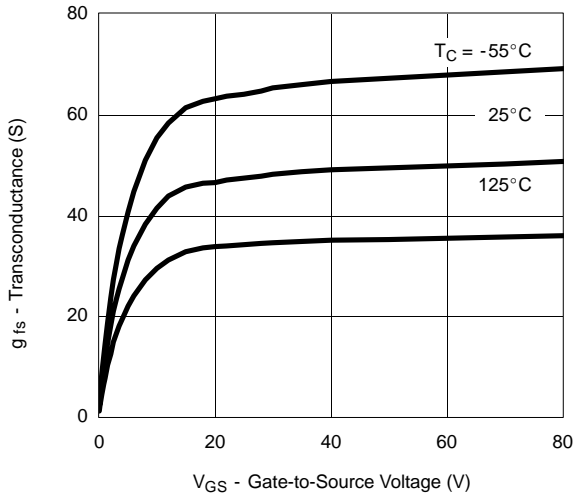
Output Characteristics



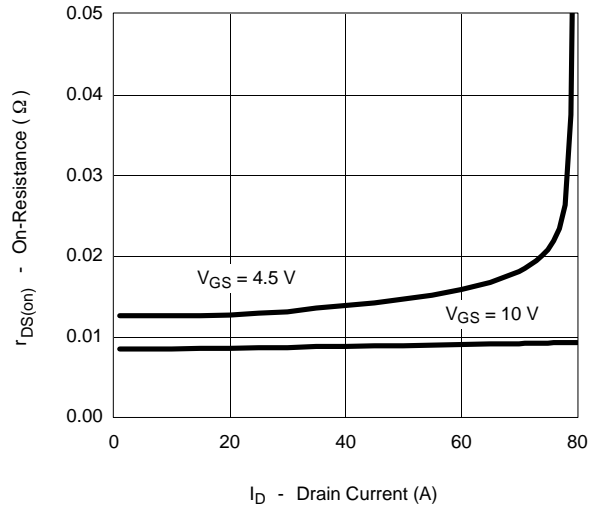
Transfer Characteristics



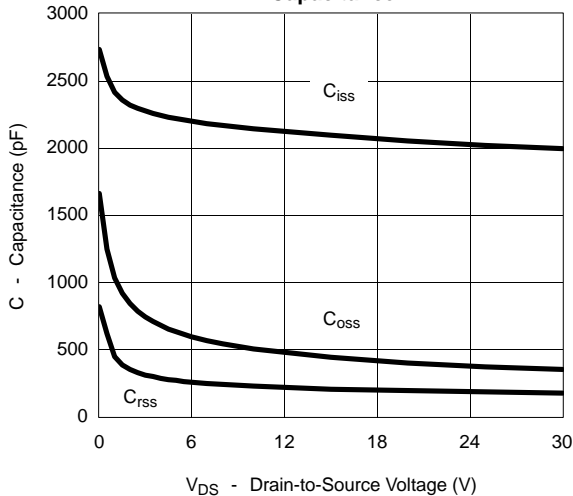
Transconductance



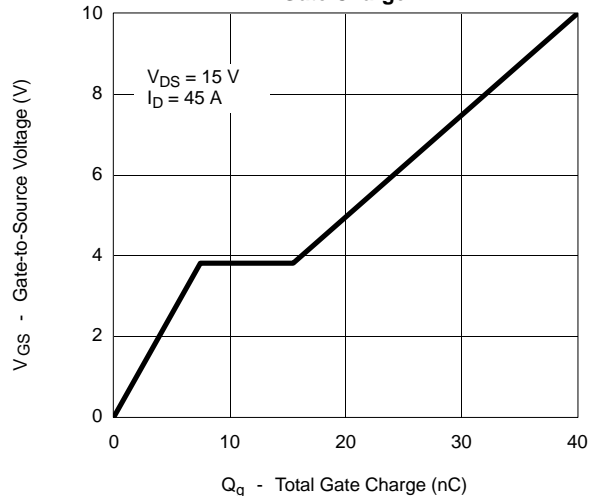
On-Resistance vs. Drain Current



Capacitance

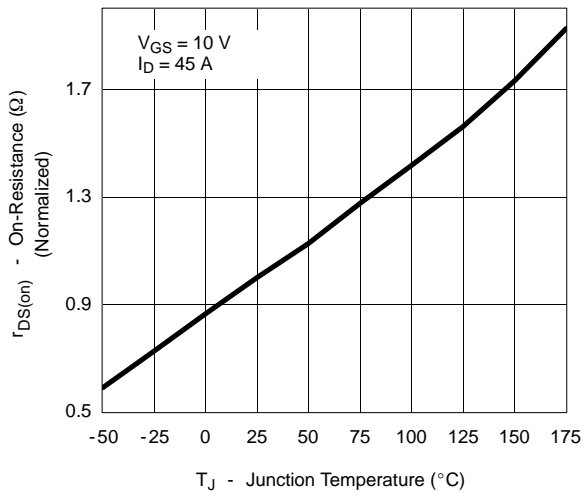


Gate Charge

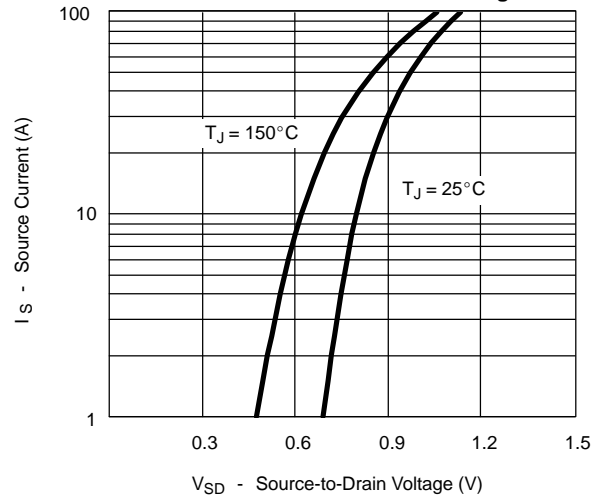


TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)

On-Resistance vs. Junction Temperature

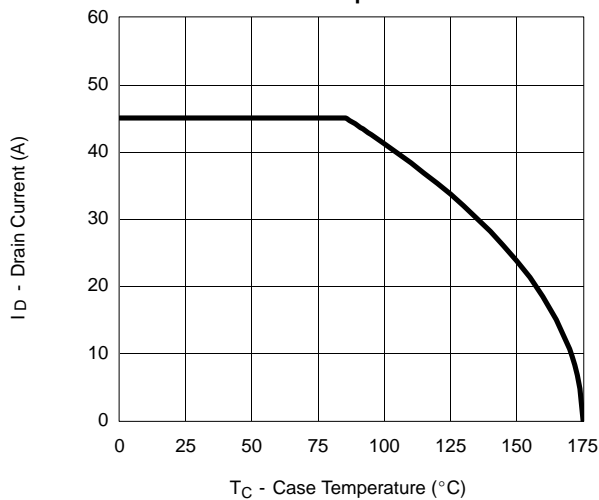


Source-Drain Diode Forward Voltage

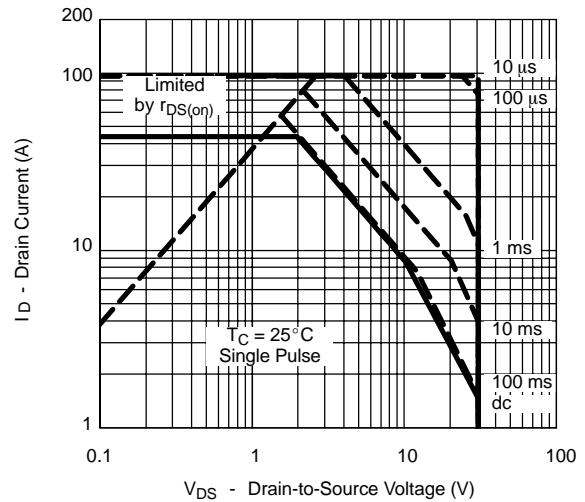


THERMAL RATINGS

Maximum Drain Current vs. Case Temperature



Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Case

