



N-Channel 100-V (D-S) 175°C MOSFET

PRODUCT SUMMARY

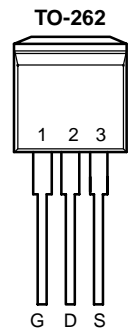
$V_{(BR)DSS}$ (V)	$r_{DS(on)}$ (Ω)	I_D (A)
100	0.0105 @ $V_{GS} = 10$ V	85 ^a
	0.012 @ $V_{GS} = 4.5$ V	

FEATURES

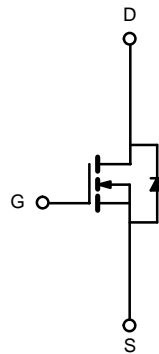
- TrenchFET® Power MOSFET
- 175°C Junction Temperature

APPLICATIONS

- DC/DC Primary Side Switch



Top View
SUV85N10-10



N-Channel MOSFET

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

Parameter	Symbol	Limit	Unit	
Drain-Source Voltage	V_{DS}	100	V	
Gate-Source Voltage	V_{GS}	± 20		
Continuous Drain Current ($T_J = 175^\circ\text{C}$)	I_D	$T_C = 25^\circ\text{C}$	85 ^a	A
		$T_C = 125^\circ\text{C}$	60 ^a	
Pulsed Drain Current	I_{DM}	240		
Avalanche Current	I_{AR}	75		
Repetitive Avalanche Energy ^b	E_{AR}	L = 0.1 mH	280	mJ
Maximum Power Dissipation ^b			$T_C = 25^\circ\text{C}$	250 ^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}	PCB Mount ^d	40	$^\circ\text{C/W}$
		Free Air	62.5	
Junction-to-Case	R_{thJC}	0.6		

Notes

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

SPECIFICATIONS ($T_J = 25^\circ\text{C}$ UNLESS OTHERWISE NOTED)						
Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0\text{ V}, I_D = 250\ \mu\text{A}$	100			V
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\ \mu\text{A}$	1		3	V
Gate-Body Leakage	I_{GSS}	$V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 80\text{ V}, V_{GS} = 0\text{ V}$			1	μA
		$V_{DS} = 80\text{ V}, V_{GS} = 0\text{ V}, T_J = 125^\circ\text{C}$			50	
		$V_{DS} = 80\text{ V}, V_{GS} = 0\text{ V}, T_J = 175^\circ\text{C}$			250	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} \geq 5\text{ V}, V_{GS} = 10\text{ V}$	120			A
Drain-Source On-State Resistance ^a	$r_{DS(on)}$	$V_{GS} = 10\text{ V}, I_D = 30\text{ A}$		0.0085	0.0105	Ω
		$V_{GS} = 4.5\text{ V}, I_D = 20\text{ A}$		0.0010	0.012	
		$V_{GS} = 10\text{ V}, I_D = 30\text{ A}, T_J = 125^\circ\text{C}$			0.017	
		$V_{GS} = 10\text{ V}, I_D = 30\text{ A}, T_J = 175^\circ\text{C}$			0.022	
Forward Transconductance ^a	g_{fs}	$V_{DS} = 15\text{ V}, I_D = 30\text{ A}$	25			S
Dynamic^b						
Input Capacitance	C_{iss}	$V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$		6550		μF
Output Capacitance	C_{oss}			665		
Reverse Transfer Capacitance	C_{rss}			265		
Total Gate Charge ^c	Q_g	$V_{DS} = 50\text{ V}, V_{GS} = 10\text{ V}, I_D = 85\text{ A}$		105	160	nC
Gate-Source Charge ^c	Q_{gs}			17		
Gate-Drain Charge ^c	Q_{gd}			23		
Turn-On Delay Time ^c	$t_{d(on)}$	$V_{DD} = 50\text{ V}, R_L = 0.6\ \Omega$ $I_D \cong 85\text{ A}, V_{GEN} = 10\text{ V}, R_G = 2.5\ \Omega$		12	25	ns
Rise Time ^c	t_r			90	135	
Turn-Off Delay Time ^c	$t_{d(off)}$			55	85	
Fall Time ^c	t_f			130	195	
Source-Drain Diode Ratings and Characteristics ($T_C = 25^\circ\text{C}$)^b						
Continuous Current	I_S				85	A
Pulsed Current	I_{SM}				240	
Forward Voltage ^a	V_{SD}	$I_F = 85\text{ A}, V_{GS} = 0\text{ V}$		1.0	1.5	V
Reverse Recovery Time	t_{rr}	$I_F = 50\text{ A}, di/dt = 100\text{ A}/\mu\text{s}$		85	140	ns
Peak Reverse Recovery Current	$I_{RM(REC)}$			4.5	7	A
Reverse Recovery Charge	Q_{rr}			0.17	0.35	μC

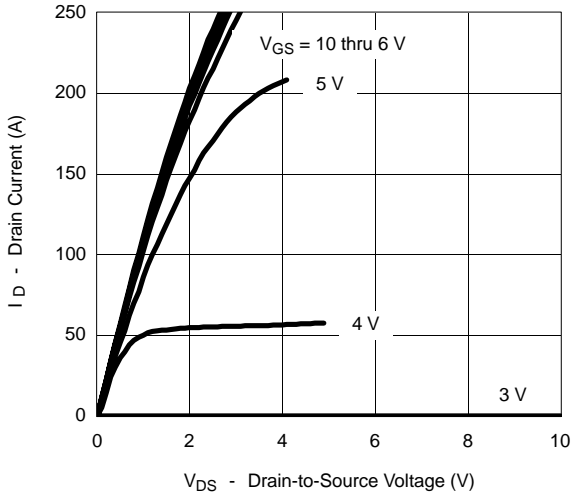
Notes

- Pulse test; pulse width $\leq 300\ \mu\text{s}$, duty cycle $\leq 2\%$.
- Guaranteed by design, not subject to production testing.
- Independent of operating temperature.

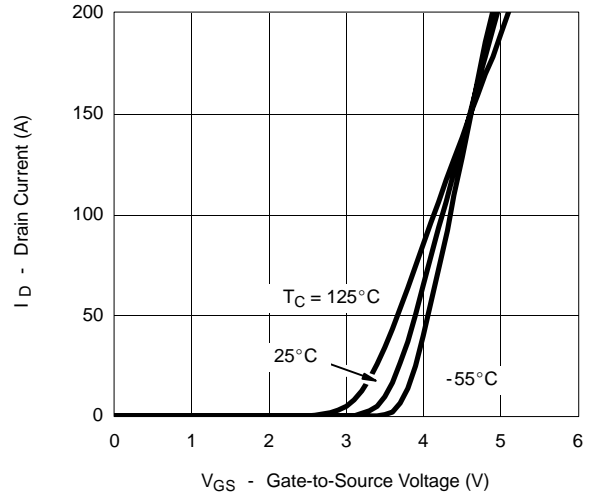


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

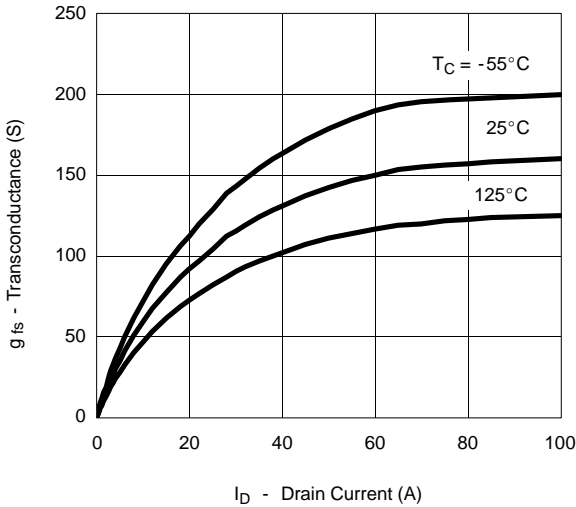
Output Characteristics



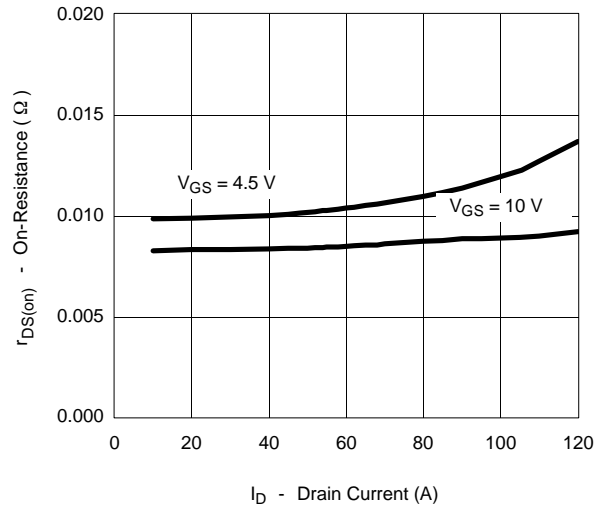
Transfer Characteristics



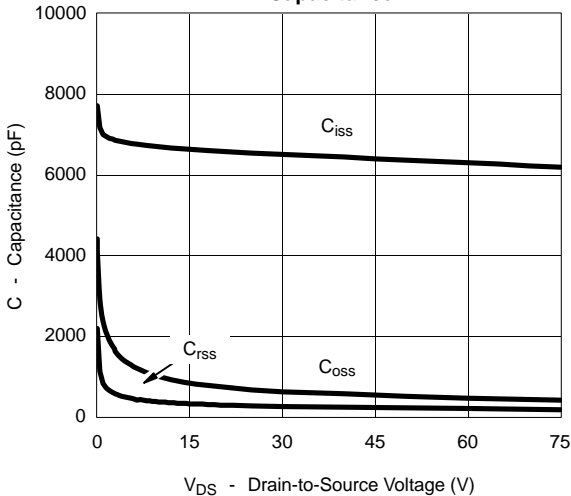
Transconductance



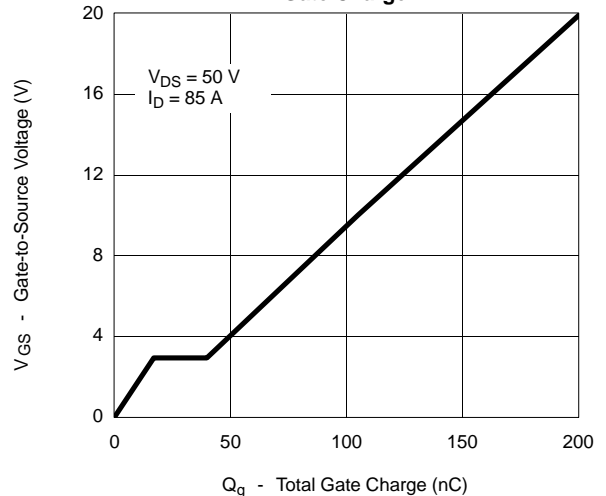
On-Resistance vs. Drain Current



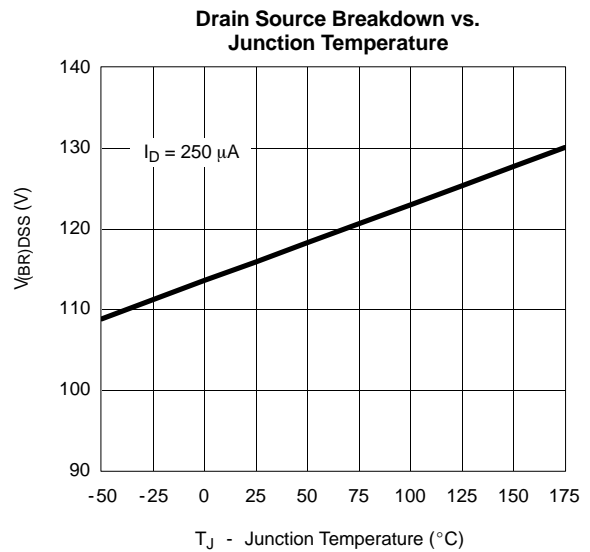
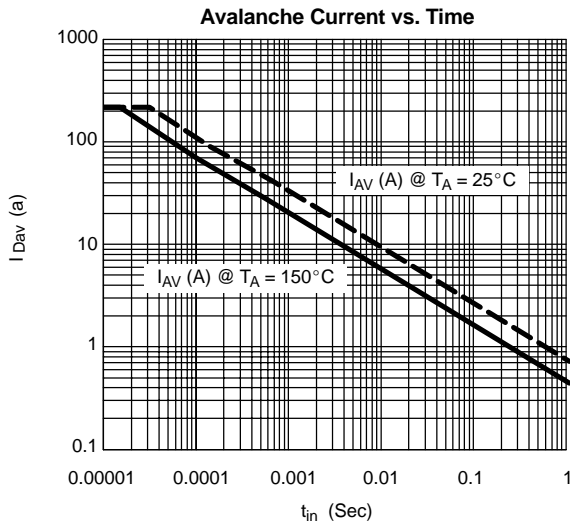
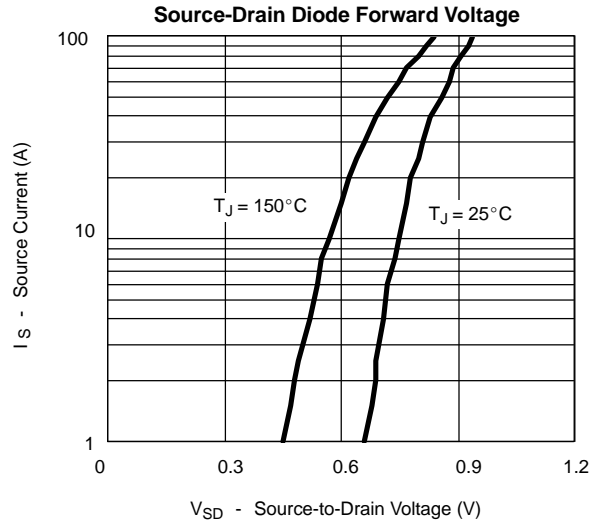
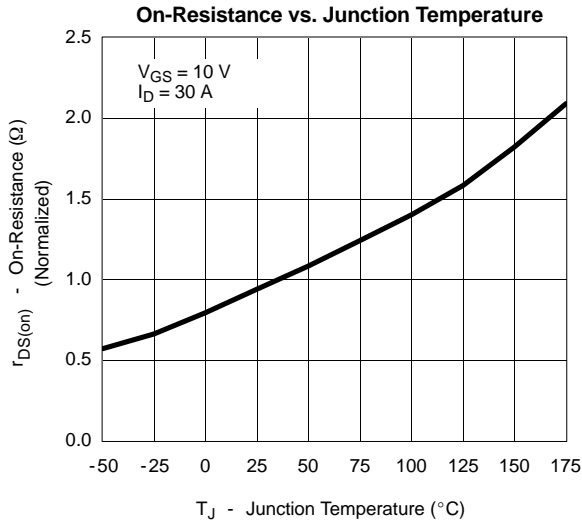
Capacitance



Gate Charge



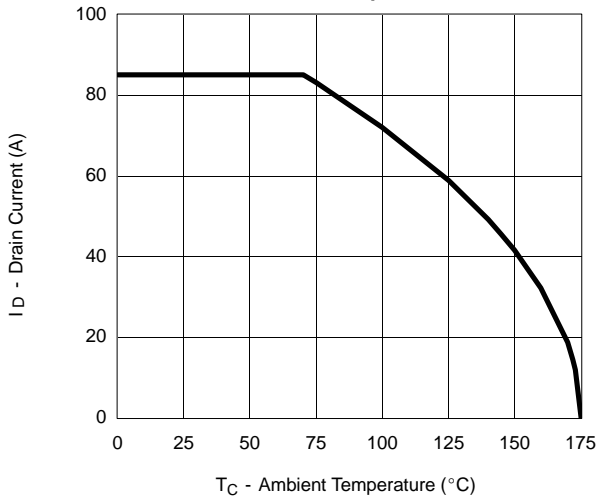
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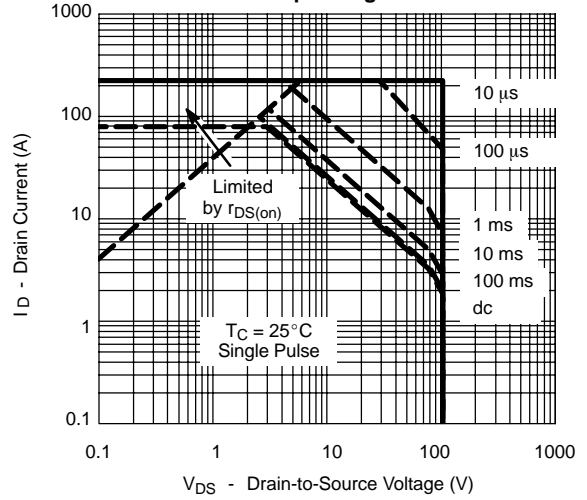


THERMAL RATINGS

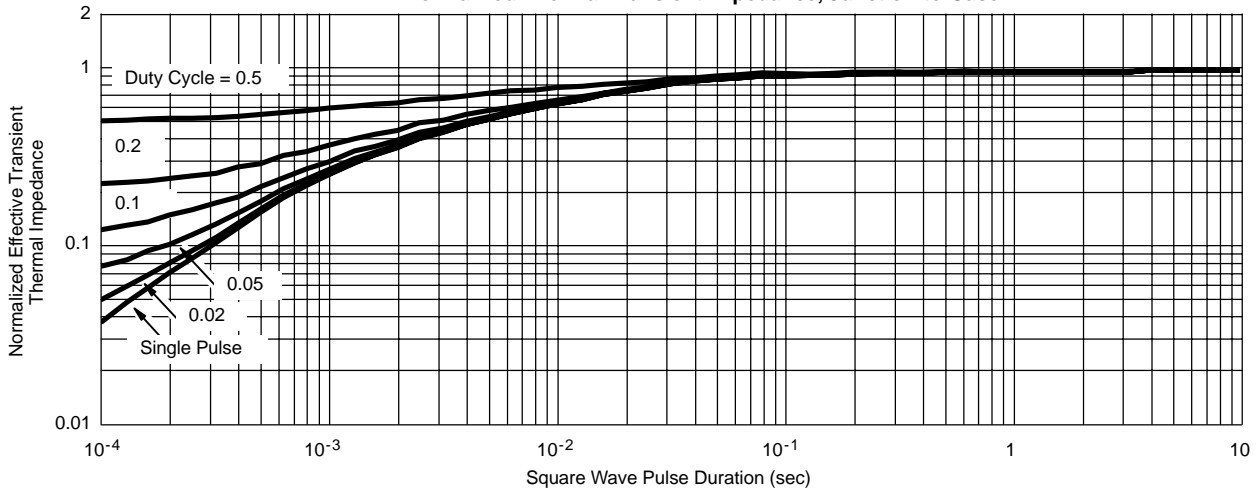
Maximum Avalanche and Drain Current vs. Case Temperature



Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Case





Disclaimer

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