

N-Channel 100-V (D-S) 175 °C MOSFET

PRODUCT SUMMARY		
V _{DS} (V)	R _{DS(on)} (Ω)	I _D (A)
100	0.0165 at V _{GS} = 10 V	60
	0.019 at V _{GS} = 6 V	56

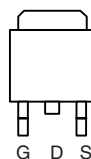
FEATURES

- TrenchFET® Power MOSFETS
- 175 °C Junction Temperature
- New Low Thermal Resistance Package
- PWM Optimized for Fast Switching

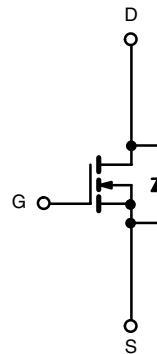

RoHS
COMPLIANT

APPLICATIONS

- Isolated DC/DC converters
- Primary-Side Switch

TO-263


Top View



N-Channel MOSFET

Ordering Information: SUM60N10-17-E3 (Lead (Pb)-free)

ABSOLUTE MAXIMUM RATINGS T _C = 25 °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 °C)	I _D	T _C = 25 °C	60 ^a	A
		T _C = 125 °C	34 ^a	
Pulsed Drain Current	I _{DM}	100		
Avalanche Current	I _{AS}	40		
Single Pulse Avalanche Energy ^b	E _{AS}	80	mJ	
Maximum Power Dissipation ^b	P _D	T _C = 25 °C	150 ^c	W
		T _A = 25 °C ^d	3.75	
Operating Junction and Storage Temperature Range	T _J , T _{stg}	- 55 to 175	°C	

THERMAL RESISTANCE RATINGS			
Parameter	Symbol	Limit	Unit
Junction-to-Ambient	R _{thJA}	40	°C/W
Junction-to-Case (Drain)	R _{thJC}	1.0	

Notes:

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

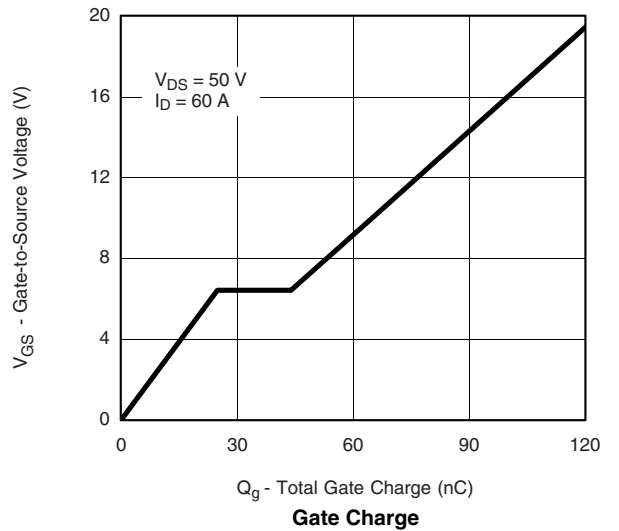
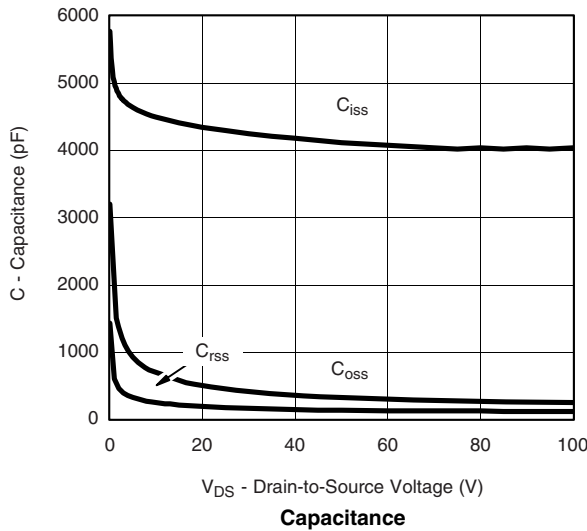
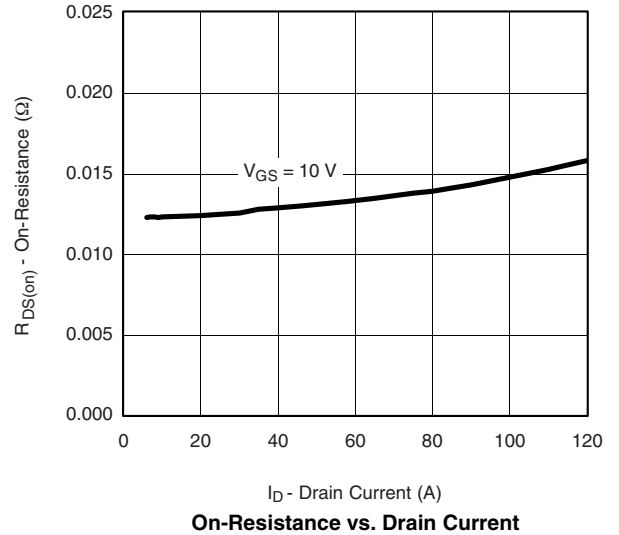
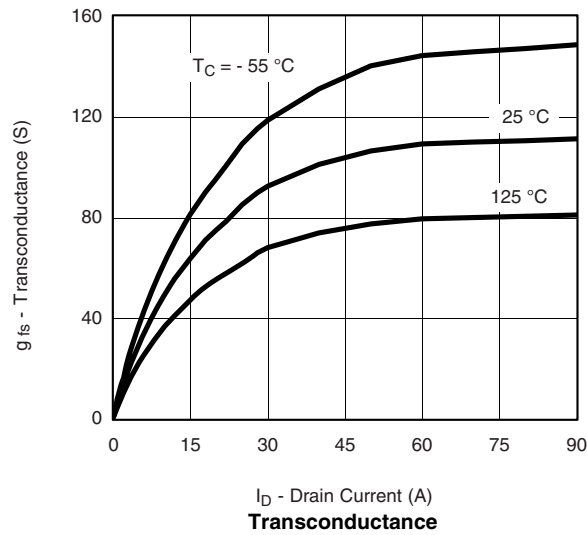
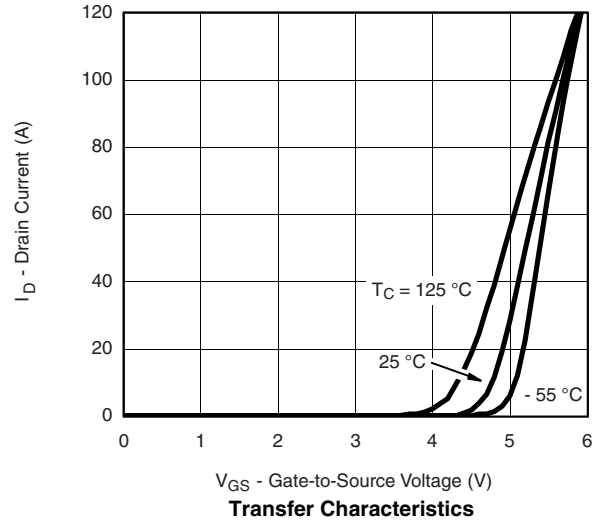
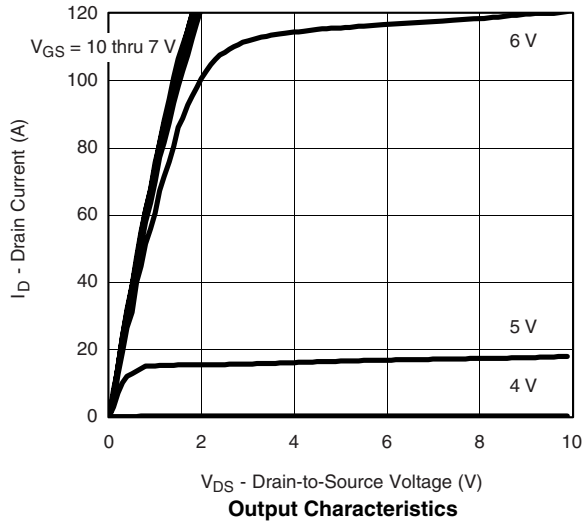
SPECIFICATIONS $T_J = 25\text{ }^\circ\text{C}$, unless otherwise noted						
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static						
Drain-Source Breakdown Voltage	V_{DS}	$V_{DS} = 0\text{ V}, I_D = 250\text{ }\mu\text{A}$	100			V
Gate-Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\text{ }\mu\text{A}$	2		4	
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
		$V_{DS} = 80\text{ V}, V_{GS} = 0\text{ V}, T_J = 125\text{ }^\circ\text{C}$			50	
		$V_{DS} = 80\text{ V}, V_{GS} = 0\text{ V}, T_J = 175\text{ }^\circ\text{C}$			250	
On-State Drain Current ^a	$I_{D(on)}$	$V_{DS} \geq 5\text{ V}, V_{GS} = 10\text{ V}$	100			A
Drain-Source On-State Resistance ^a	$R_{DS(on)}$	$V_{GS} = 10\text{ V}, I_D = 30\text{ A}$		0.013	0.0165	Ω
		$V_{GS} = 6\text{ V}, I_D = 20\text{ A}$		0.015	0.019	
		$V_{GS} = 10\text{ V}, I_D = 30\text{ A}, T_J = 125\text{ }^\circ\text{C}$			0.031	
		$V_{GS} = 10\text{ V}, I_D = 30\text{ A}, T_J = 175\text{ }^\circ\text{C}$			0.041	
Forward Transconductance ^a	g_{fs}	$V_{DS} = 15\text{ V}, I_D = 30\text{ A}$	25			S
Dynamic^b						
Input Capacitance	C_{iss}	$V_{GS} = 0\text{ V}, V_{DS} = 25\text{ V}, f = 1\text{ MHz}$		4300		pF
Output Capacitance	C_{oss}			450		
Reverse Transfer Capacitance	C_{rss}			175		
Total Gate Charge ^c	Q_g	$V_{DS} = 50\text{ V}, V_{GS} = 10\text{ V}, I_D = 60\text{ A}$		65	100	nC
Gate-Source Charge ^c	Q_{gs}			25		
Gate-Drain Charge ^c	Q_{gd}			19		
Gate Resistance	R_G			1.5		Ω
Turn-On Delay Time ^c	$t_{d(on)}$	$V_{DD} = 50\text{ V}, R_L = 1.5\text{ }\Omega$ $I_D \cong 60\text{ A}, V_{GEN} = 10\text{ V}, R_G = 2.5\text{ }\Omega$		15	25	ns
Rise Time ^c	t_r			12	20	
Turn-Off Delay Time ^c	$t_{d(off)}$			30	45	
Fall Time ^c	t_f			10	15	
Source-Drain Diode Ratings and Characteristics $T_C = 25\text{ }^\circ\text{C}$ ^b						
Continuous Current	I_S				60	A
Pulsed Current	I_{SM}				100	
Forward Voltage ^a	V_{SD}	$I_F = 30\text{ A}, V_{GS} = 0\text{ V}$		1.0	1.5	V
Reverse Recovery Time	t_{rr}	$I_F = 50\text{ A}, di/dt = 100\text{ A}/\mu\text{s}$		125	200	ns
Peak Reverse Recovery Current	$I_{RM(REC)}$			8	12	A
Reverse Recovery Charge	Q_{rr}			0.5	1.2	μC

Notes:

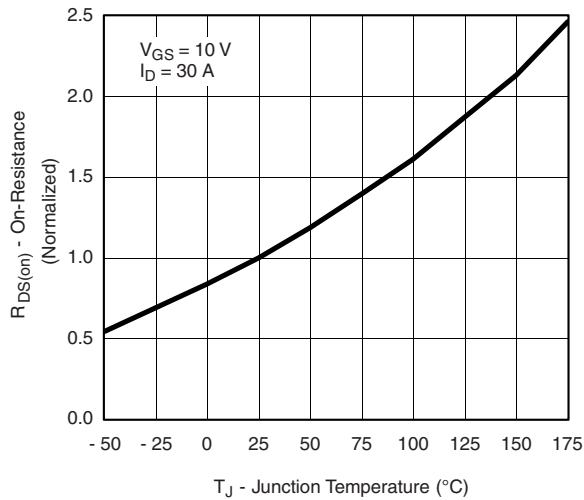
- Pulse test; pulse width $\leq 300\text{ }\mu\text{s}$, duty cycle $\leq 2\%$.
- Guaranteed by design, not subject to production testing.
- Independent of operating temperature.

Stresses beyond those listed under "Absolute Maximum Ratings" may cause permanent damage to the device. These are stress ratings only, and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

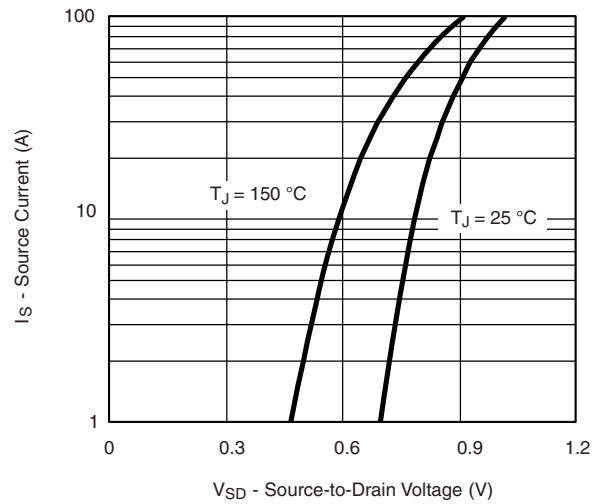
TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted



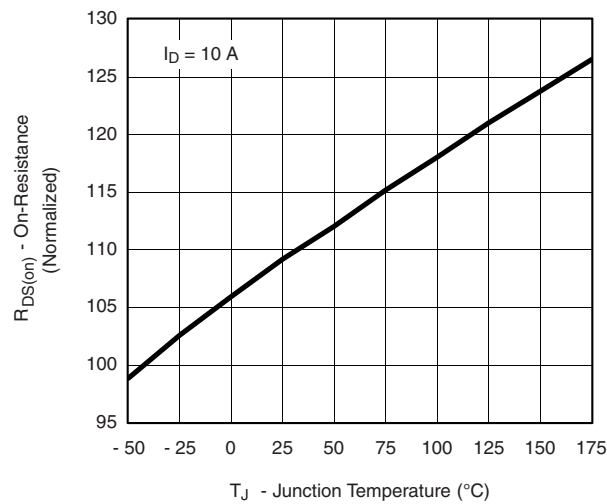
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On-Resistance vs. Junction Temperature

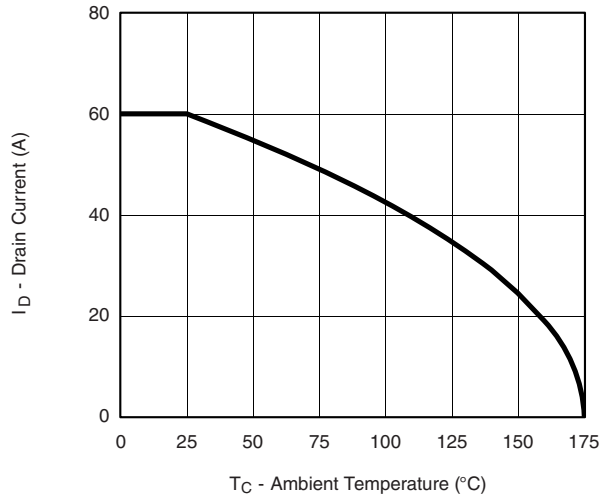


Source-Drain Diode Forward Voltage

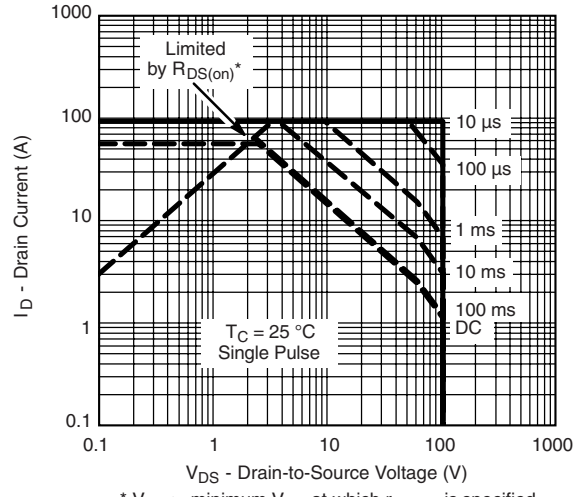


On-Resistance vs. Junction Temperature

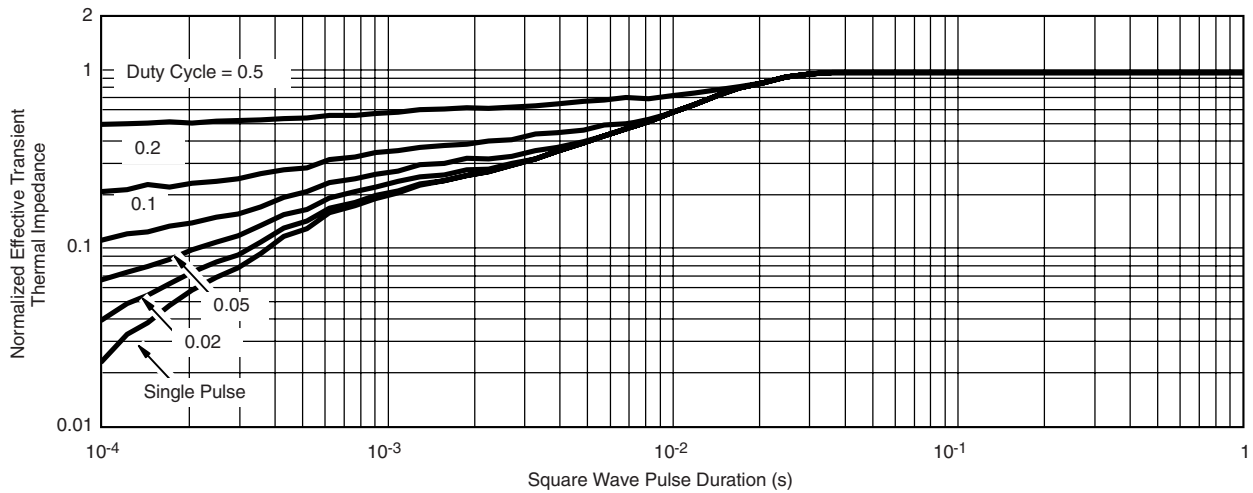
THERMAL RATINGS



Maximum Avalanche and Drain Current vs. Case Temperature



Safe Operating Area
* $V_{GS} >$ minimum V_{GS} at which $r_{DS(on)}$ is specified



Normalized Thermal Transient Impedance, Junction-to-Case

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