

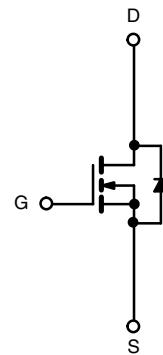
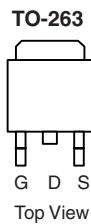
N-Channel 250-V (D-S) 175 °C MOSFET

PRODUCT SUMMARY		
$V_{(BR)DSS}$ (V)	$r_{DS(on)}$ (Ω)	I_D (A)

250 0.165 at $V_{GS} = 10$ V 18

FEATURES

- TrenchFET® Power MOSFET
- 175 °C Junction Temperature
- Low Thermal Resistance Package



Ordering Information: SUM18N25-165-E3 (Lead (Pb)-free)

N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS $T_C = 25$ °C, unless otherwise noted			
Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	250	V
Gate-Source Voltage	V_{GS}	± 20	
Continuous Drain Current ($T_J = 175$ °C)	I_D	18	A
		10.4	
Pulsed Drain Current	I_{DM}	20	
Single Pulse Avalanche Current	I_{AS}	5	
Single Pulse Avalanche Energy ^a	E_{AS}	1.25	mJ
Maximum Power Dissipation ^a	P_D	150 ^b	W
		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:

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

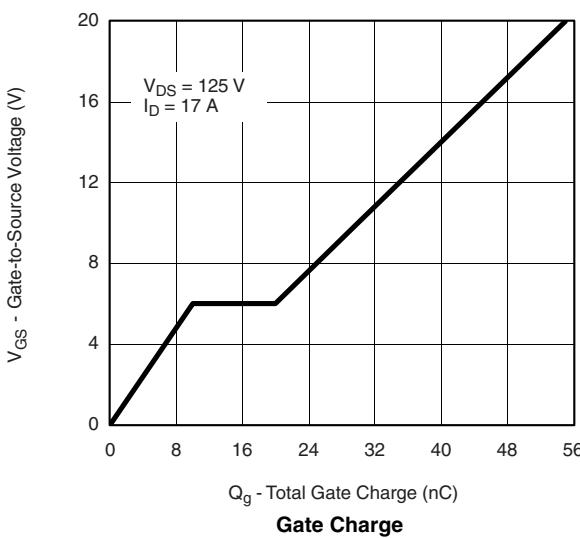
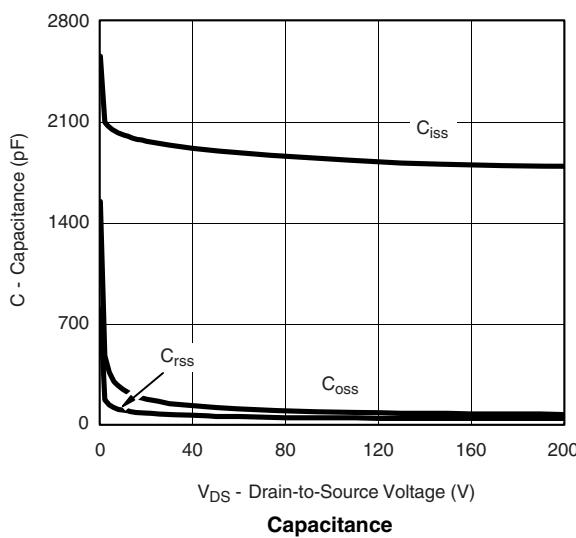
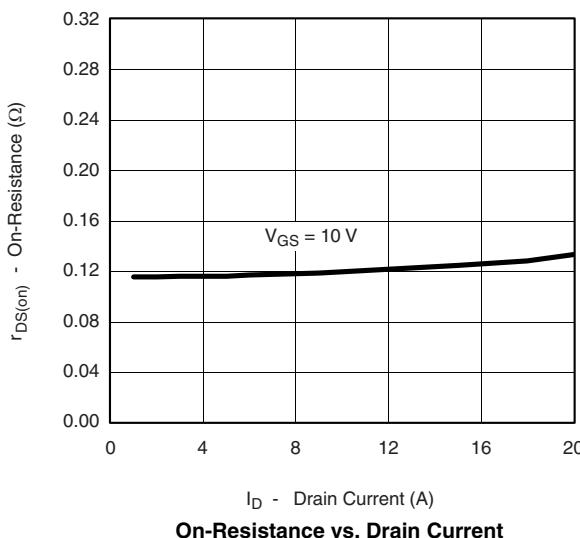
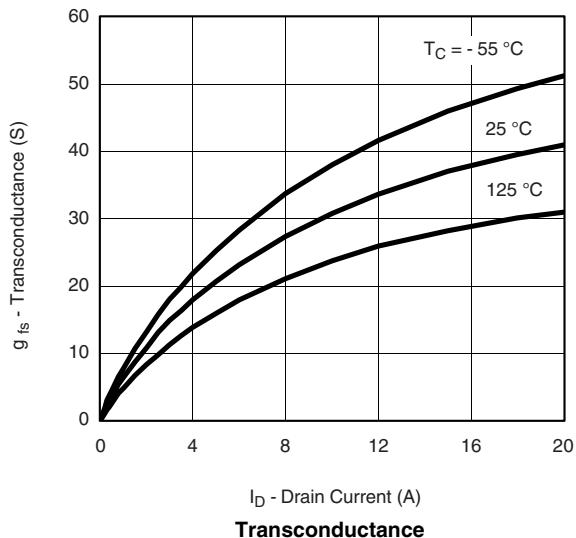
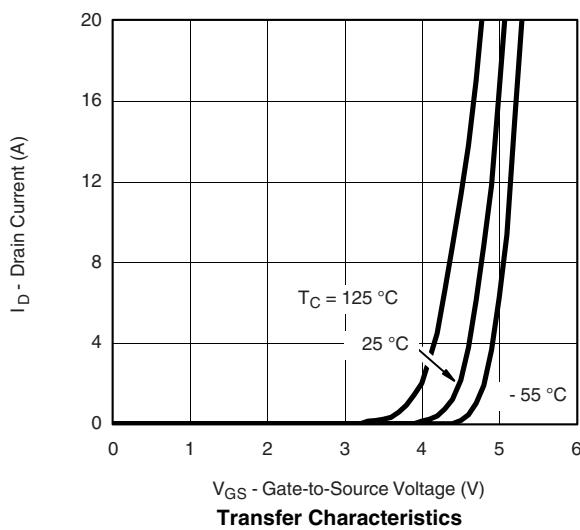
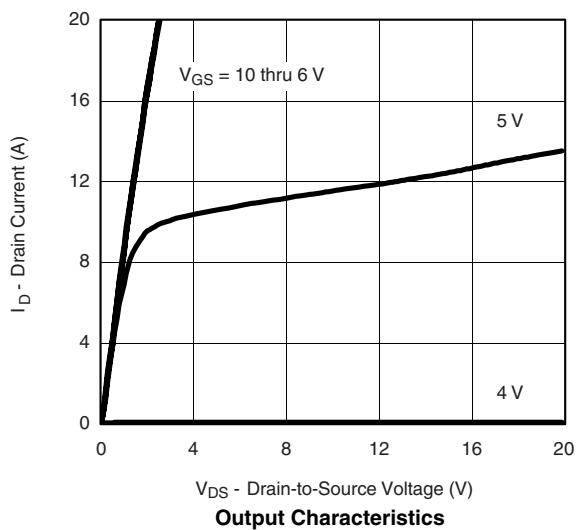
SPECIFICATIONS $T_J = 25^\circ\text{C}$, unless otherwise noted

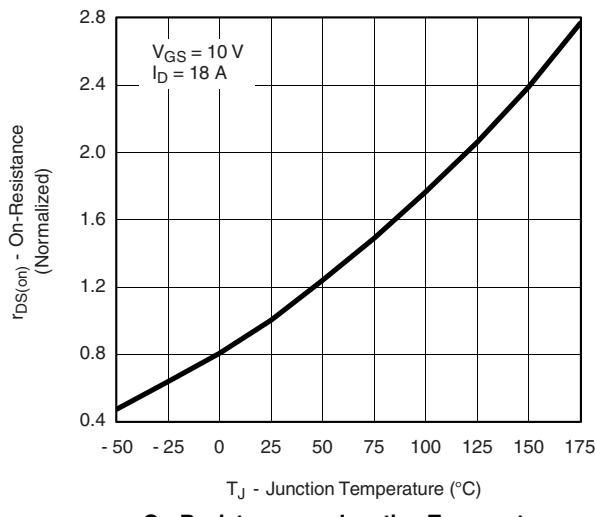
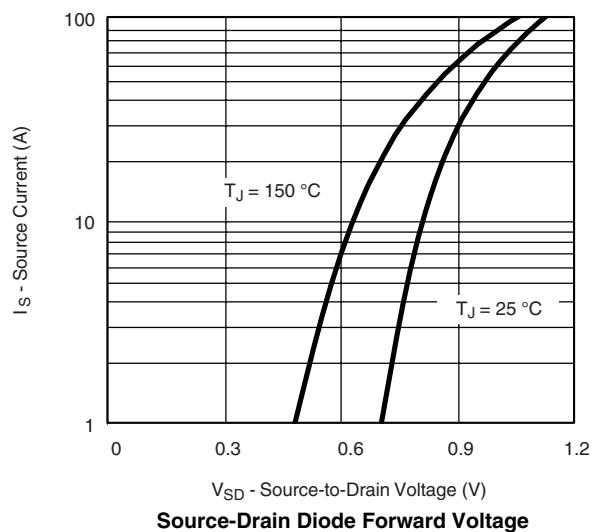
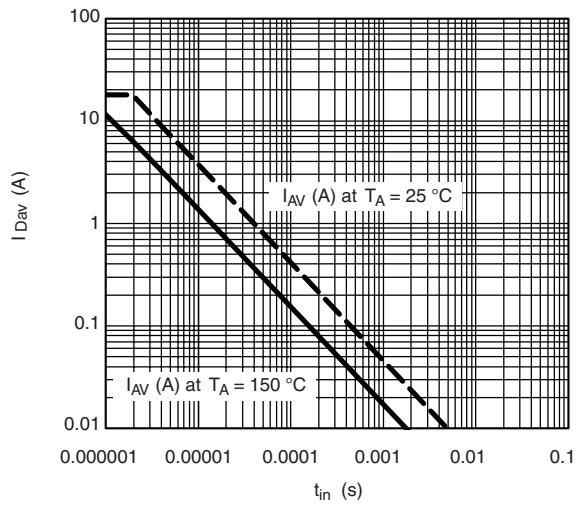
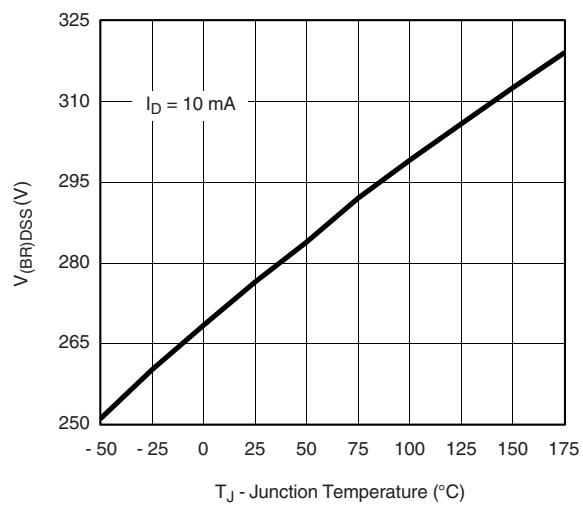
Parameter	Symbol	Test Conditions	Min.	Typ.	Max.	Unit
Static						
Drain-Source Breakdown Voltage	$V_{(\text{BR})\text{DSS}}$	$V_{\text{DS}} = 0 \text{ V}, I_D = 250 \mu\text{A}$	250			V
Gate-Threshold Voltage	$V_{\text{GS}(\text{th})}$	$V_{\text{DS}} = V_{\text{GS}}, I_D = 250 \mu\text{A}$	2.5		4	
Gate-Body Leakage	I_{GSS}	$V_{\text{DS}} = 0 \text{ V}, V_{\text{GS}} = \pm 20 \text{ V}$			± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	$V_{\text{DS}} = 250 \text{ V}, V_{\text{GS}} = 0 \text{ V}$			1	μA
		$V_{\text{DS}} = 250 \text{ V}, V_{\text{GS}} = 0 \text{ V}, T_J = 125^\circ\text{C}$			50	
		$V_{\text{DS}} = 250 \text{ V}, V_{\text{GS}} = 0 \text{ V}, T_J = 175^\circ\text{C}$			250	
On-State Drain Current ^a	$I_{\text{D}(\text{on})}$	$V_{\text{DS}} \geq 15 \text{ V}, V_{\text{GS}} = 10 \text{ V}$	20			A
Drain-Source On-State Resistance ^a	$r_{\text{DS}(\text{on})}$	$V_{\text{GS}} = 10 \text{ V}, I_D = 14 \text{ A}$		0.130	0.165	Ω
		$V_{\text{GS}} = 10 \text{ V}, I_D = 14 \text{ A}, T_J = 125^\circ\text{C}$			0.347	
		$V_{\text{GS}} = 10 \text{ V}, I_D = 14 \text{ A}, T_J = 175^\circ\text{C}$			0.462	
Forward Transconductance ^a	g_{fs}	$V_{\text{DS}} = 15 \text{ V}, I_D = 18 \text{ A}$		36		S
Dynamic^b						
Input Capacitance	C_{iss}	$V_{\text{GS}} = 0 \text{ V}, V_{\text{DS}} = 25 \text{ V}, f = 1 \text{ MHz}$		1950		pF
Output Capacitance	C_{oss}			160		
Reverse Transfer Capacitance	C_{rss}			70		
Total Gate Charge ^c	Q_g	$V_{\text{DS}} = 125 \text{ V}, V_{\text{GS}} = 10 \text{ V}, I_D = 18 \text{ A}$		30	45	nC
Gate-Source Charge ^c	Q_{gs}			10		
Gate-Drain Charge ^c	Q_{gd}			10		
Gate Resistance	R_g			1.6		Ω
Turn-On Delay Time ^c	$t_{\text{d}(\text{on})}$	$V_{\text{DD}} = 125 \text{ V}, R_L = 7.0 \Omega$ $I_D \geq 18 \text{ A}, V_{\text{GEN}} = 10 \text{ V}, R_g = 2.5 \Omega$		15	25	ns
Rise Time ^c	t_r			130	195	
Turn-Off Delay Time ^c	$t_{\text{d}(\text{off})}$			30	45	
Fall Time ^c	t_f			100	150	
Source-Drain Diode Ratings and Characteristics $T_C = 25^\circ\text{C}^b$						
Continuous Current	I_S				18	A
Pulsed Current	I_{SM}				20	
Forward Voltage ^a	V_{SD}	$I_F = 18 \text{ A}, V_{\text{GS}} = 0 \text{ V}$		1.0	1.5	V
Reverse Recovery Time	t_{rr}	$I_F = 18 \text{ A}, \text{di/dt} = 100 \text{ A}/\mu\text{s}$		115	175	ns
Peak Reverse Recovery Charge	$I_{\text{RM}(\text{REC})}$			10	15	A
Reverse Recovery Charge	Q_{rr}			0.58	1.3	μC

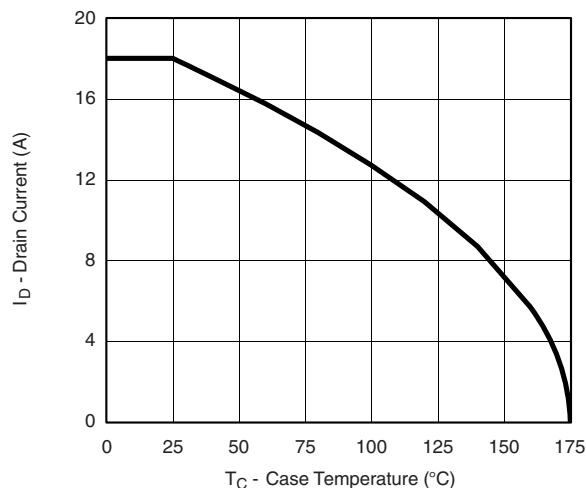
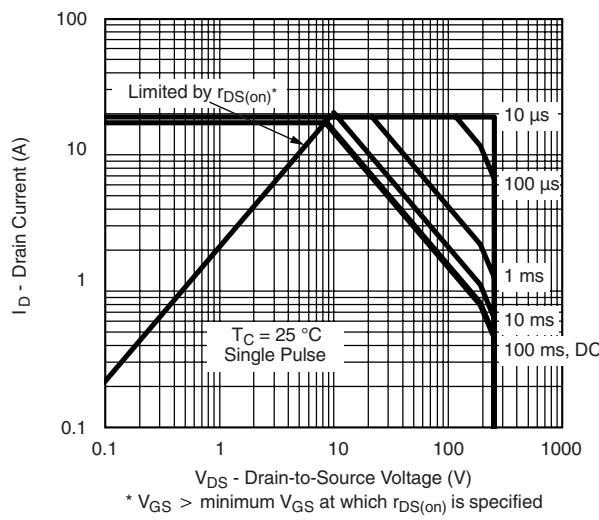
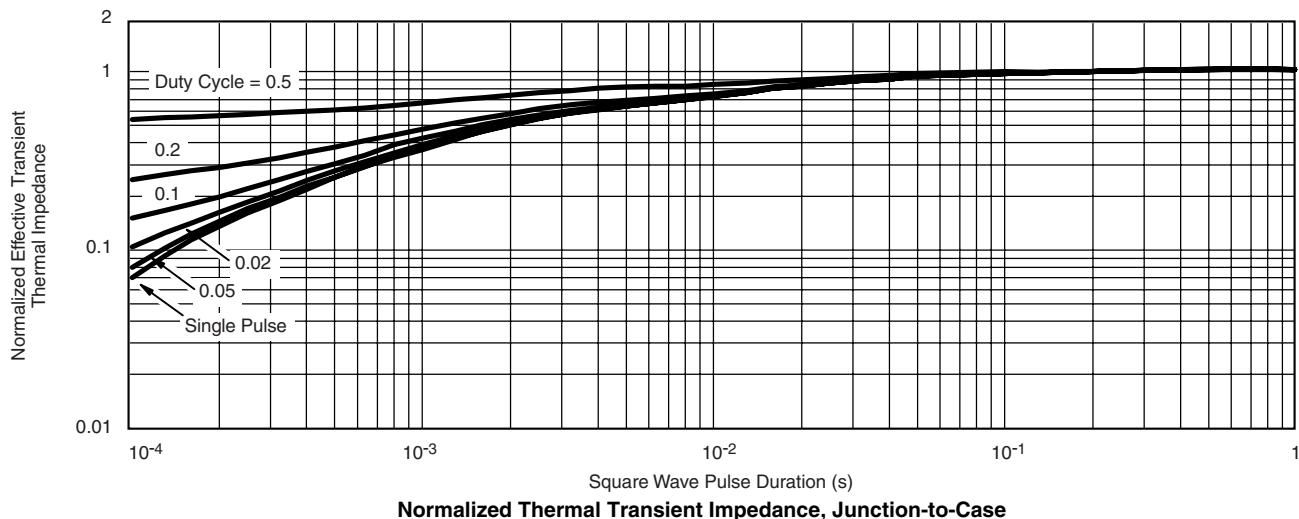
Notes:

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


TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted**On-Resistance vs. Junction Temperature****Source-Drain Diode Forward Voltage****Avalanche Current vs. Time****Drain Source Breakdown vs. Junction Temperature**

THERMAL RATINGS

Maximum Drain Current vs. Case Temperature

Safe Operating Area

Normalized Thermal Transient Impedance, Junction-to-Case

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