



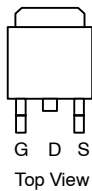
N-Channel 30-V (D-S) 175°C MOSFET

PRODUCT SUMMARY			
$V_{(BR)DSS}$ (V)	$r_{DS(on)}$ (Ω)	I_D (A)	Q_g (Typ)
30	0.030 @ $V_{GS} = 10$ V	40	18
	0.045 @ $V_{GS} = 4.5$ V	33	

FEATURES

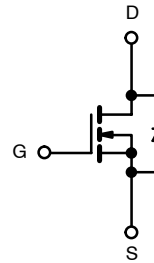
- TrenchFET® Power MOSFET
- 175°C Junction Temperature
- 100% R_g Tested

TO-263



DRAIN connected to TAB

Ordering Information: SUM40N03-30L—E3



N-Channel MOSFET

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ 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	$T_C = 25^\circ\text{C}$	A
		$T_C = 100^\circ\text{C}$	
Pulsed Drain Current	I_{DM}	40	A
Single Pulse Avalanche Current	I_{AS}	30	
Repetitive Avalanche Energy ^a	E_{AS}	$L = 0.1$ mH	mJ
Maximum Power Dissipation ^a		$T_C = 25^\circ\text{C}$	
		$T_A = 25^\circ\text{C}$ ^c	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			

Notes

- Duty cycle $\leq 1\%$.
- See SOA curve for voltage derating.
- 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	30			V
Gate-Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 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	30			A
Drain-Source On-State Resistance ^a	r _{DS(on)}	V _{GS} = 10 V, I _D = 15 A		0.020	0.030	Ω
		V _{GS} = 10 V, I _D = 15 A, T _J = 125 °C			0.050	
		V _{GS} = 10 V, I _D = 15 A, T _J = 175 °C			0.054	
		V _{GS} = 4.5 V, I _D = 12.5 A		0.030	0.045	
Forward Transconductance ^a	g _{fs}	V _{DS} = 15 V, I _D = 15 A	10	22		S
Dynamic^b						
Input Capacitance	C _{iss}	V _{GS} = 0 V, V _{DS} = 25 V, f = 1 MHz		1170		pF
Output Capacitance	C _{oss}			320		
Reverse Transfer Capacitance	C _{rss}			60		
Total Gate Charge ^b	Q _g	V _{DS} = 15 V, V _{GS} = 10 V, I _D = 30 A		18	26	nC
Gate-Source Charge ^b	Q _{gs}			5.5		
Gate-Drain Charge ^b	Q _{gd}			2		
Gate Resistance	R _g		0.9	1.8	2.7	Ω
Turn-On Delay Time ^b	t _{d(on)}	V _{DD} = 15 V, R _L = 0.5 Ω I _D ≅ 30 A, V _{GEN} = 10 V, R _g = 2.5 Ω		10	20	ns
Rise Time ^b	t _r			10	20	
Turn-Off Delay Time ^b	t _{d(off)}			25	40	
Fall Time ^b	t _f			15	30	
Source-Drain Diode Ratings and Characteristics (T_C = 25 °C)^c						
Continuous Current	I _S				40	A
Pulsed Current	I _{SM}				40	
Forward Voltage ^a	V _{SD}	I _F = 30 A, V _{GS} = 0 V		1.1	1.5	V
Reverse Recovery Time	t _{rr}	I _F = 30 A, di/dt = 100 A/μs		50	100	ns
Peak Reverse Recovery Current	I _{RM}			3.9	7.8	A
Reverse Recovery Charge	Q _{rr}			98	390	nC

Notes

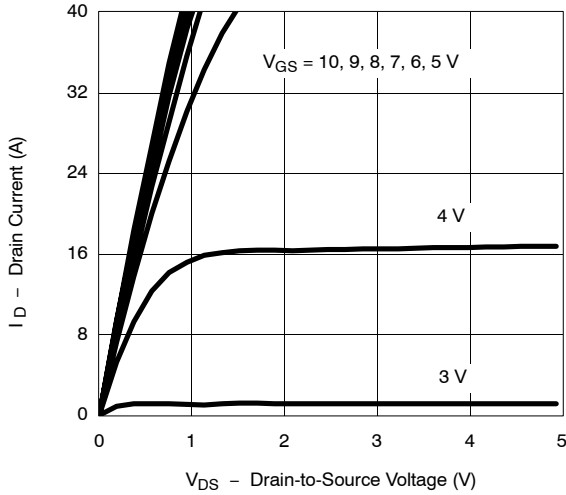
- Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2%.
- Independent of operating temperature.
- Guaranteed by design, not subject to production testing.

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.

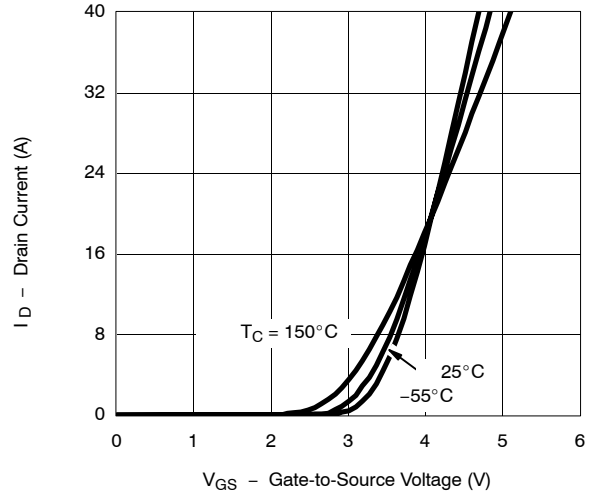


TYPICAL CHARACTERISTICS (25°C UNLESS NOTED)

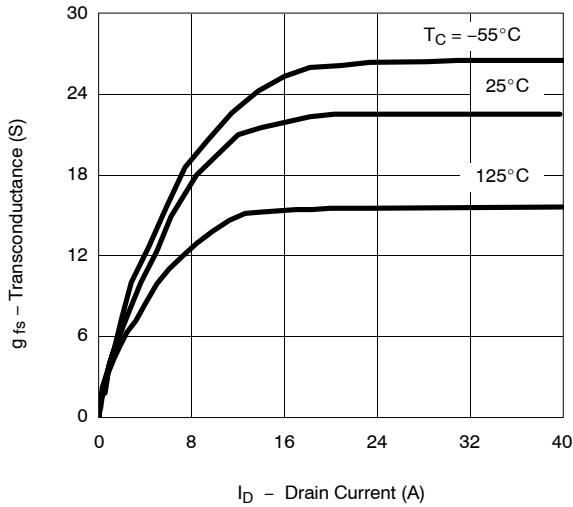
Output Characteristics



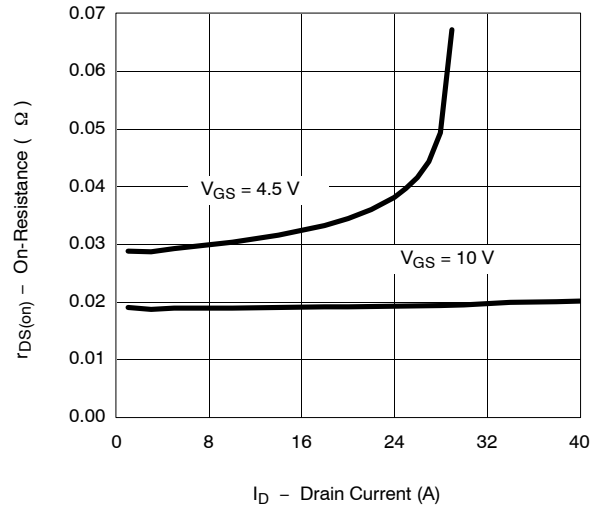
Transfer Characteristics



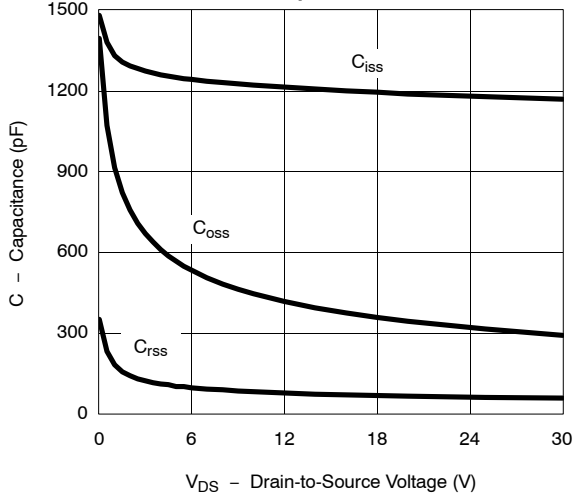
Transconductance



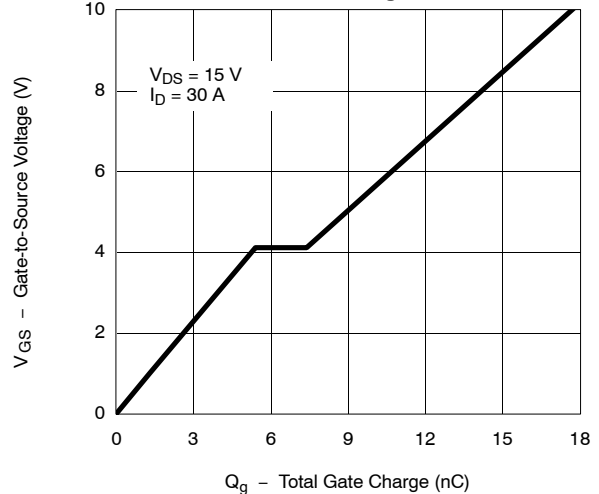
On-Resistance vs. Drain Current



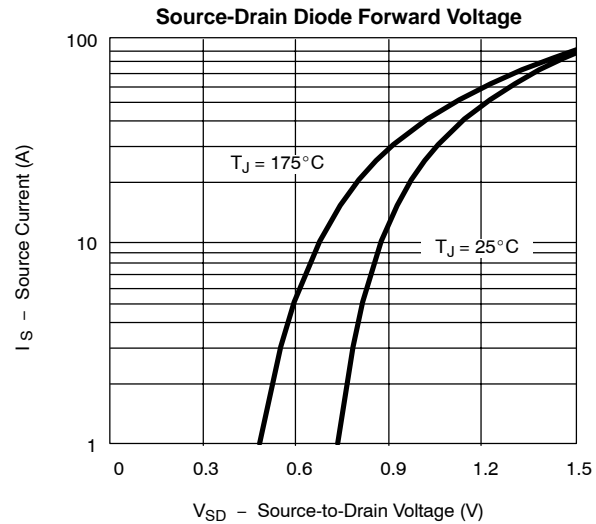
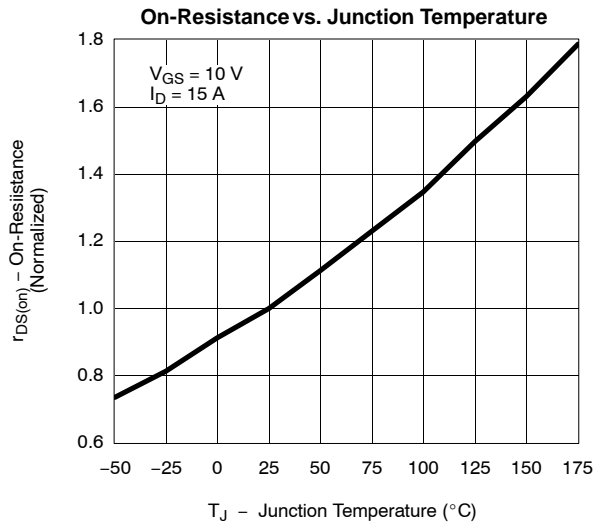
Capacitance



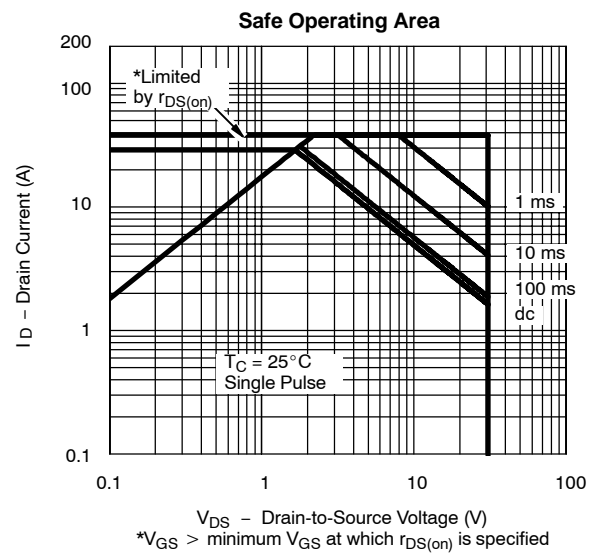
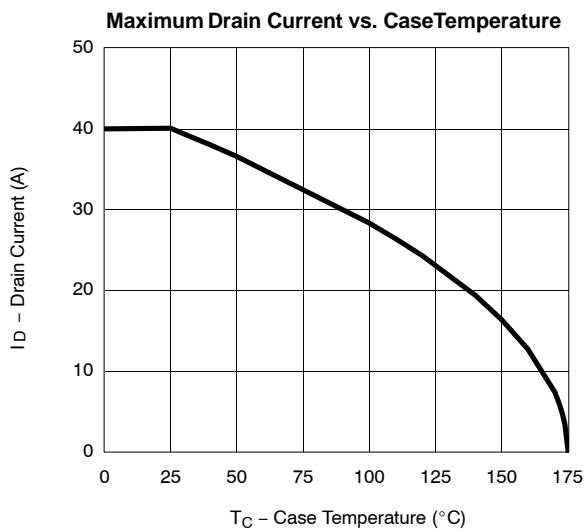
Gate Charge



TYPICAL CHARACTERISTICS (25 °C UNLESS NOTED)

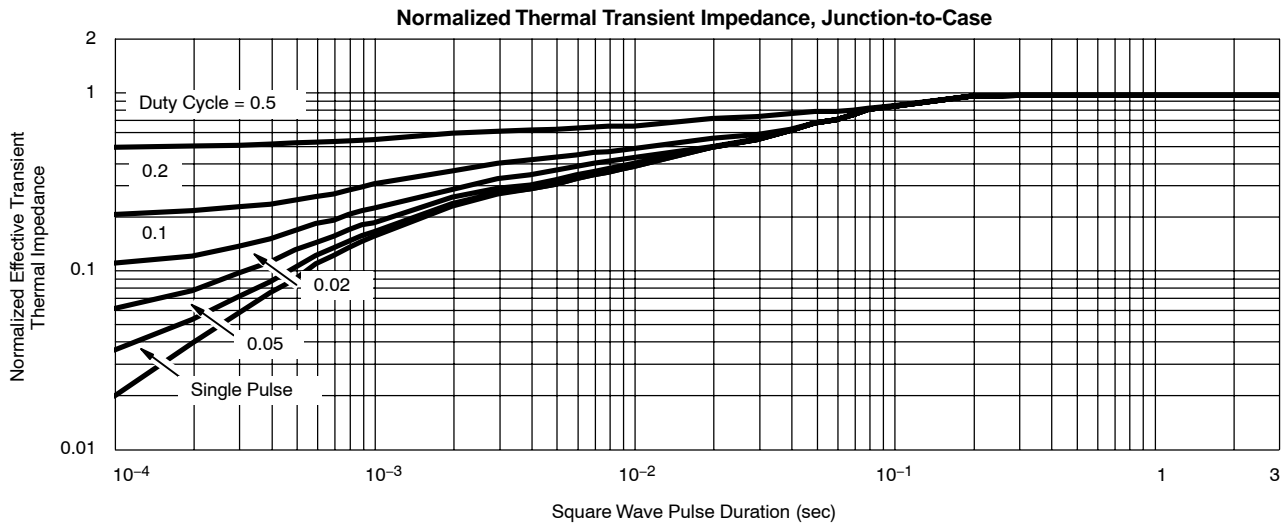


THERMAL RATINGS





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