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# N-Channel 100 V (D-S) 175 °C MOSFET

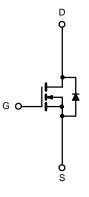
PRODUCT SUMMARY				
V <sub>DS</sub> (V)	R <sub>DS(on)</sub> (Ω)	I <sub>D</sub> (A)		
100	0.004 at V <sub>GS</sub> = 10 V	140 <sup>a</sup>		

#### **FEATURES**

- TrenchFET<sup>®</sup> Power MOSFET
- New Package with Low Thermal Resistance
- 100 % R<sub>g</sub> Tested







N-Channel MOSFET

ABSOLUTE MAXIMUM RATI	<b>NGS</b> $T_C = 25 ^{\circ}C$ , unless other	rwise noted			
Parameter		Symbol	Limit	Unit	
Drain-Source Voltage	V <sub>DS</sub>	100	V		
Gate-Source Voltage	V <sub>GS</sub>	± 20	- V		
	T <sub>C</sub> = 25 °C	1	140 <sup>a</sup>		
Continuous Drain Current ( $T_J = 175 \text{ °C}$ )	T <sub>C</sub> = 125 °C	I <sub>D</sub>	87 <sup>a</sup>	А	
Pulsed Drain Current	I <sub>DM</sub>	440	A		
Avalanche Current	I <sub>AR</sub>	75	1		
epetitive Avalanche Energy <sup>b</sup> L = 0.1 mH		E <sub>AR</sub>	280	mJ	
Maximum Power Dissipation <sup>b</sup>	T <sub>C</sub> = 25 °C	D	375 <sup>c</sup>	W	
Maximum Power Dissipation-	T <sub>A</sub> = 25 °C	P <sub>D</sub>	3.75	VV	
Operating Junction and Storage Temperation	T <sub>J</sub> , T <sub>stg</sub>	- 55 to 175	°C		

THERMAL RESISTANCE RATINGS							
Parameter		Symbol	Limit	Unit			
Junction-to-Ambient	PCB Mount (TO-263) <sup>d</sup>	R <sub>thJA</sub>	40	°C/W			
Junction-to-Case (Drain)		R <sub>thJC</sub>	0.4	C/VV			

Notes:

a. Package limited.

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

<b>SPECIFICATIONS</b> $T_J = 25^{\circ}$	C, unless o	therwise noted					
Parameter	Symbol	Test Conditions	Min.	Тур.	Max.	Unit	
Static							
Drain-Source Breakdown Voltage	V <sub>DS</sub>	$V_{DS} = 0 V, I_{D} = 250 \mu A$	100			V	
Gate-Threshold Voltage	V <sub>GS(th)</sub>	$V_{DS} = V_{GS}, I_D = 250 \ \mu A$	2		4	v	
Gate-Body Leakage	I <sub>GSS</sub>	$V_{DS} = 0 V, V_{GS} = \pm 20 V$			± 100	nA	
		$V_{DS} = 100 \text{ V}, \text{ V}_{GS} = 0 \text{ V}$			1		
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	$V_{DS}$ = 100 V, $V_{GS}$ = 0 V, $T_{J}$ = 125 °C			50	μA	
		$V_{DS}$ = 100 V, $V_{GS}$ = 0 V, $T_{J}$ = 175 °C			250		
On-State Drain Current <sup>a</sup>	I <sub>D(on)</sub>	$V_{DS} \ge 5 \text{ V}, V_{GS} = 10 \text{ V}$	120			А	
		V <sub>GS</sub> = 10 V, I <sub>D</sub> = 30 A		0.004			
Drain-Source On-State Resistance <sup>a</sup>	R <sub>DS(on)</sub>	V <sub>GS</sub> = 10 V, I <sub>D</sub> = 30 A, T <sub>J</sub> = 125 °C		0.017		Ω	
		V <sub>GS</sub> = 10 V, I <sub>D</sub> = 30 A, T <sub>J</sub> = 175 °C		0.025			
Forward Transconductance <sup>a</sup>	9 <sub>fs</sub>	V <sub>DS</sub> = 15 V, I <sub>D</sub> = 30 A	25			S	
Dynamic <sup>b</sup>							
Input Capacitance	C <sub>iss</sub>			5500		pF	
Output Capacitance	C <sub>oss</sub>	$V_{GS}$ = 0 V, $V_{DS}$ = 25 V, f = 1 MHz		750			
Reverse Transfer Capacitance	C <sub>rss</sub>			280			
Total Gate Charge <sup>c</sup>	Qg			110	160	nC	
Gate-Source Charge <sup>c</sup>	Q <sub>gs</sub>	$V_{DS} = 50 \text{ V}, V_{GS} = 10 \text{ V}, I_D = 85 \text{ A}$		24			
Gate-Drain Charge <sup>c</sup>	Q <sub>gd</sub>			24			
Gate Resistance	R <sub>g</sub>		1.0		6.2	Ω	
Turn-On Delay Time <sup>c</sup>	t <sub>d(on)</sub>			20	30		
Rise Time <sup>c</sup>	t <sub>r</sub>	$V_{DD}$ = 50 V, $R_{L}$ = 0.6 $\Omega$		125	200	ns	
Turn-Off Delay Time <sup>c</sup>	t <sub>d(off)</sub>	$\text{I}_\text{D} \cong$ 85 A, $\text{V}_\text{GEN}$ = 10 V, $\text{R}_\text{g}$ = 2.5 $\Omega$		55	85	115	
Fall Time <sup>c</sup>	t <sub>f</sub>			130	195		
Source-Drain Diode Ratings and Ch	aracteristics 7	Γ <sub>C</sub> = 25 °C <sup>b</sup>					
Continuous Current	۱ <sub>S</sub>				140	А	
Pulsed Current	I <sub>SM</sub>				240	A	
Forward Voltage <sup>a</sup>	V <sub>SD</sub>	I <sub>F</sub> = 85 A, V <sub>GS</sub> = 0 V		1.0	1.5	V	
Reverse Recovery Time	t <sub>rr</sub>			70	140	ns	
Peak Reverse Recovery Charge	I <sub>RM(REC)</sub>	I <sub>F</sub> = 50 A, dl/dt = 100 A/μs		5.5	10	А	
Reverse Recovery Charge	Q <sub>rr</sub>			0.19	0.35	μC	

Notes:

a. Pulse test; pulse width  $\leq$  300 µs, 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.

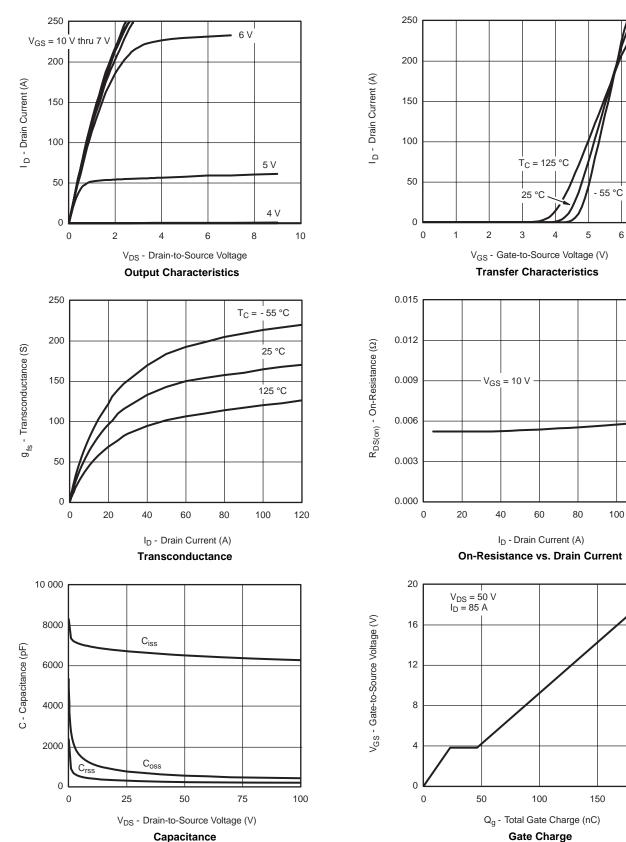
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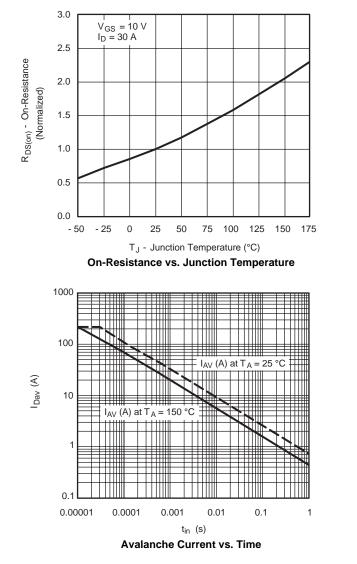


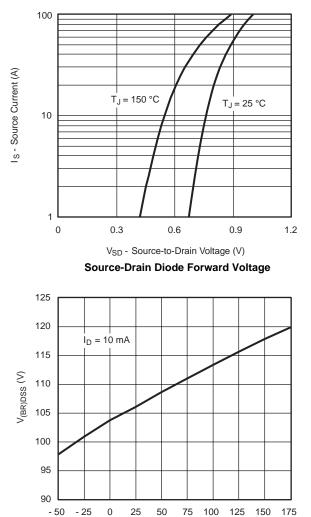
#### TYPICAL CHARACTERISTICS 25 °C, unless otherwise noted

200



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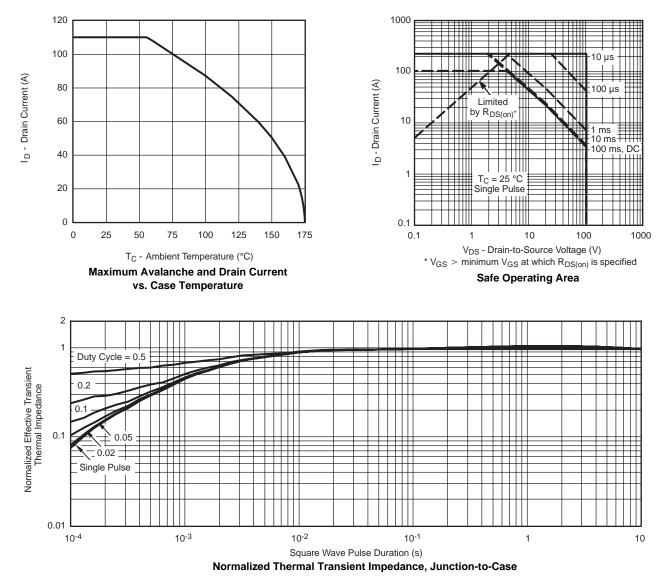


T<sub>J</sub> - Junction Temperature (°C) Drain Source Breakdown vs. Junction Temperature

### SUM90N10-8M2P-GE3

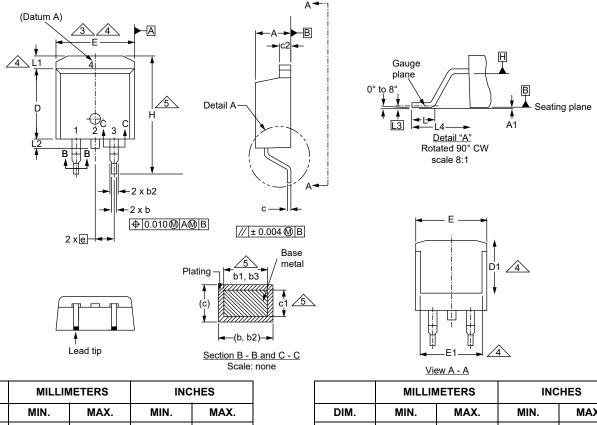


#### **THERMAL RATINGS**





#### **TO-263AB (HIGH VOLTAGE)**



	MILLIMETERS		INCHES			MILLIN	MILLIMETERS		INCHES	
DIM.	MIN.	MAX.	MIN.	MAX.	DIM.	M. MIN.	MAX.	MIN.	MAX.	
А	4.06	4.83	0.160	0.190	D1	1 6.86	-	0.270	-	
A1	0.00	0.25	0.000	0.010	E	9.65	10.67	0.380	0.420	
b	0.51	0.99	0.020	0.039	E1	1 6.22	-	0.245	-	
b1	0.51	0.89	0.020	0.035	е	2.54	2.54 BSC		0.100 BSC	
b2	1.14	1.78	0.045	0.070	н	I 14.61	15.88	0.575	0.625	
b3	1.14	1.73	0.045	0.068	L	. 1.78	2.79	0.070	0.110	
с	0.38	0.74	0.015	0.029	L1	1 -	1.65	-	0.066	
c1	0.38	0.58	0.015	0.023	L2	2 -	1.78	-	0.070	
c2	1.14	1.65	0.045	0.065	L3	3 0.25	0.25 BSC		0.010 BSC	
D	8.38	9.65	0.330	0.380	L4	4 4.78	5.28	0.188	0.208	

Notes

1. Dimensioning and tolerancing per ASME Y14.5M-2018.

2. Dimensions are shown in millimeters (inches).

3. Dimension D and E do not include mold flash. Mold flash shall not exceed 0.127 mm (0.005") per side. These dimensions are measured at the outmost extremes of the plastic body at datum A.

4. Thermal PAD contour optional within dimension E, L1, D1 and E1.

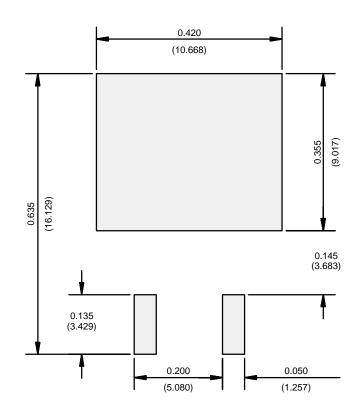
5. Dimension b1 and c1 apply to base metal only.

6. Datum A and B to be determined at datum plane H.

7. Outline conforms to JEDEC outline to TO-263AB.



#### **RECOMMENDED MINIMUM PADS FOR D<sup>2</sup>PAK: 3-Lead**



Recommended Minimum Pads Dimensions in Inches/(mm)



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