Din-Tek SEMICONDUCTOR

DTM6930

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N-Channel 100 V (D-S) MOSFET

PRODUCT SUMMARY		
V_{DS} (V)	$R_{DS(on)}$ (Ω)	I_D (A)
100	0.105 at V_{GS} = 10 V	4.2
	0.115 at V_{GS} = 4.5 V	3.9

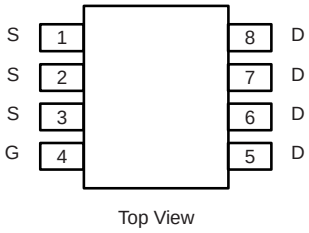
FEATURES

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

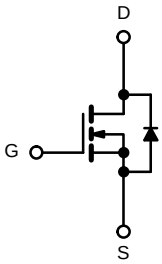
RoHS COMPLIANT

APPLICATIONS

- Load Switch
- LED Backlighting in LCD TVs



Top View



N-Channel MOSFET

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)[b]	T_C = 25 °C	I_D	4.2	A
	T_C = 125 °C		3.2	
Pulsed Drain Current		I_{DM}	12.6	
Continuous Source Current (Diode Conduction)		I_S	4.5	
Avalanche Current		I_{AR}	4.5	
Repetitive Avalanche Energy (Duty Cycle ≤ 1 %)	L = 0.1 mH	E_{AR}	1.8	mJ
Maximum Power Dissipation	T_C = 25 °C	P_D	4.8[b]	W
	T_A = 25 °C		2.4[a]	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	- 55 to 175	°C

THERMAL RESISTANCE RATINGS					
Parameter		**Symbol**	**Typical**	**Maximum**	**Unit**
Junction-to-Ambient[a]	t ≤ 10 s	R_{thJA}	40	51	°C/W
	Steady State		18	25	
Junction-to-Case		R_{thJC}	2	2.4	

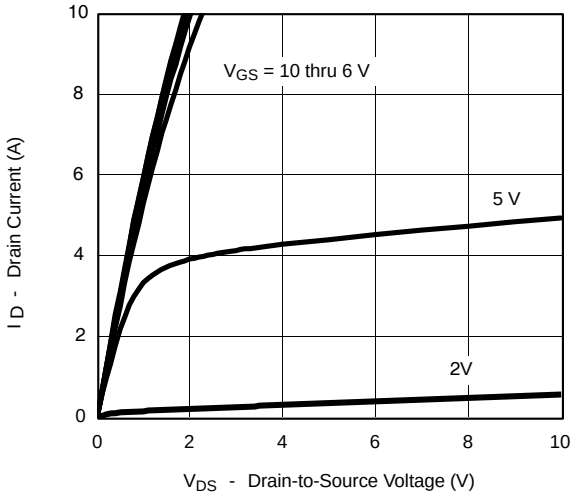
Notes:
a. Surface mounted on 1" x 1" FR4 board.
b. See SOA curve for voltage derating.

SPECIFICATIONS (T_J = 25 °C, unless otherwise noted)						
Parameter	**Symbol**	**Test Conditions**	**Min.**	**Typ.[a]**	**Max.**	**Unit**
Static						
Drain-Source Breakdown Voltage	V_{DS}	V_{GS} = 0 V, I_D = 250 µA	100			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} = 80 V, V_{GS} = 0 V			1	µA
		V_{DS} = 80 V, V_{GS} = 0 V, T_J = 125 °C			50	
		V_{DS} = 80 V, V_{GS} = 0 V, T_J = 175 °C			250	
On-State Drain Current[b]	$I_{D(on)}$	V_{DS} = 5 V, V_{GS} = 10 V			12.6	A
Drain-Source On-State Resistance[b]	$R_{DS(on)}$	V_{GS} = 10 V, I_D = 2.7 A		0.105	0.117	Ω
		V_{GS} = 10 V, I_D = 2.5 A, T_J = 125 °C			0.129	
		V_{GS} = 10 V, I_D = 2.5 A, T_J = 175 °C			0.134	
		V_{GS} = 4.5 V, I_D = 2.5 A		0.115	0.128	
Forward Transconductance[b]	g_{fs}	V_{DS} = 15 V, I_D = 2.5 A		7		S
Dynamic[a]						
Input Capacitance	C_{iss}	V_{GS} = 0 V, V_{DS} = 80 V, f = 1 MHz		1561		pF
Output Capacitance	C_{oss}			110		
Reverse Transfer Capacitance	C_{rss}			65		
Total Gate Charge[c]	Q_g	V_{DS} = 80 V, V_{GS} = 10 V, I_D = 15 A		7	11	nC
Gate-Source Charge[c]	Q_{gs}			2.1		
Gate-Drain Charge[c]	Q_{gd}			2.6		
Gate Resistance	R_g			3		Ω
Turn-On Delay Time[c]	$t_{d(on)}$	V_{DD} = 80 V, R_L = 5 Ω I_D ≅ 15 A, V_{GEN} = 10 V, R_G = 2.5 Ω		10		ns
Rise Time[c]	t_r			16		
Turn-Off Delay Time[c]	$t_{d(off)}$			11		
Fall Time[c]	t_f			15		
Source-Drain Diode Ratings and Characteristic (T_C = 25 °C)						
Pulsed Current	I_{SM}				12.6	A
Diode Forward Voltage[b]	V_{SD}	I_F = 15 A, V_{GS} = 0 V		0.8	1.2	V
Source-Drain Reverse Recovery Time	t_{rr}	I_F = 15 A, dI/dt = 100 A/µs		50	80	ns

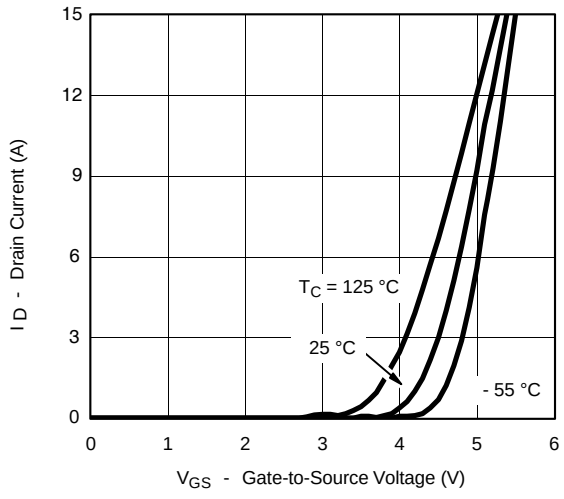
Notes:
a. Guaranteed by design, not subject to production testing.
b. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2 %.
c. Independent of operating temperature.

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.

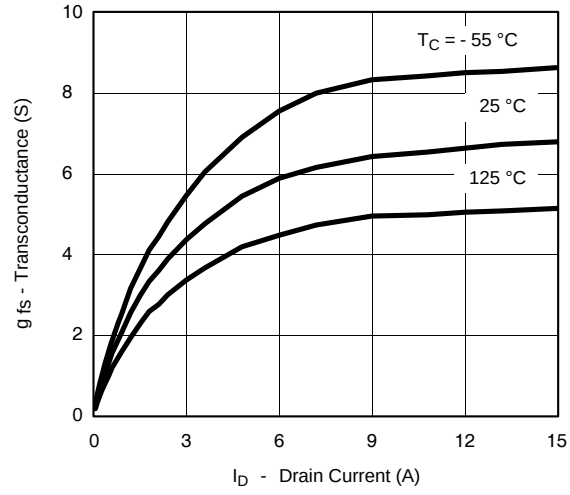
TYPICAL CHARACTERISTICS (25 °C unless noted)



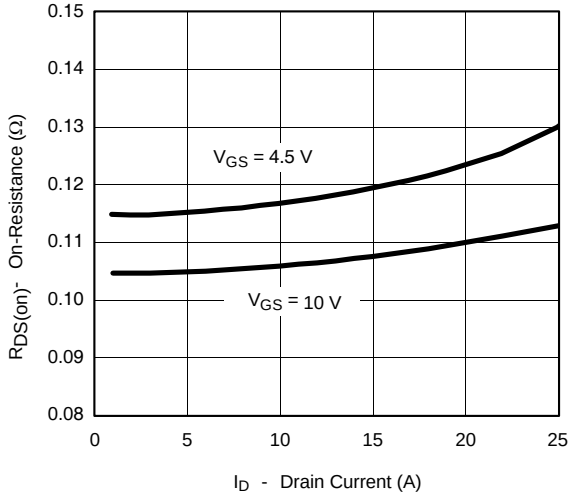
Output Characteristics



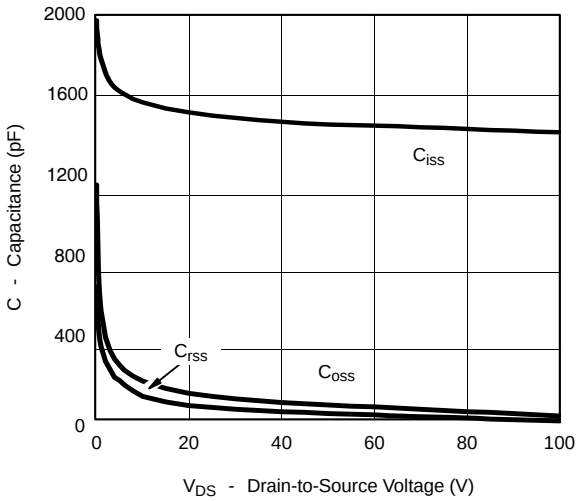
Transfer Characteristics



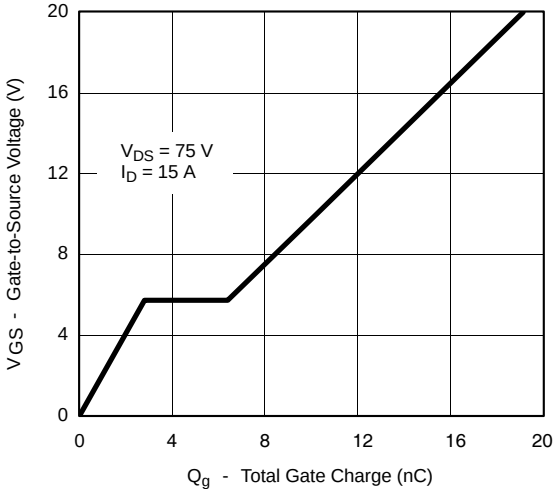
Transconductance



On-Resistance vs. Drain Current

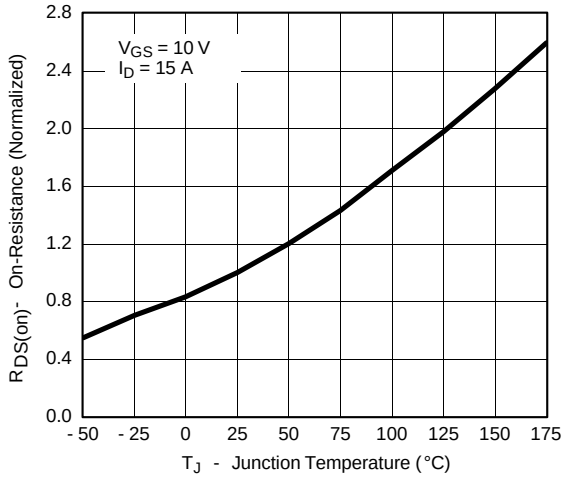


Capacitance

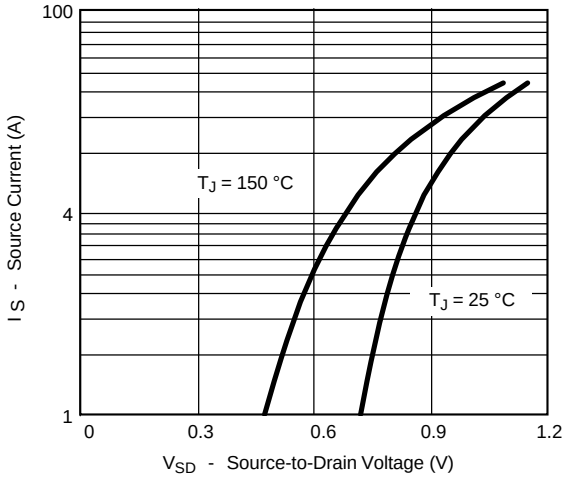


Gate Charge

TYPICAL CHARACTERISTICS (25 °C unless noted)

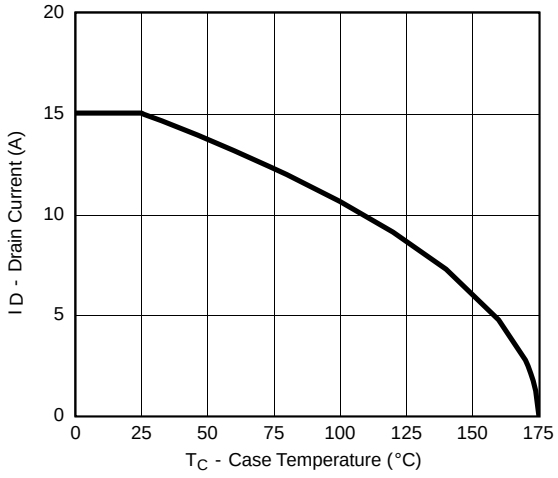


On-Resistance vs. Junction Temperature

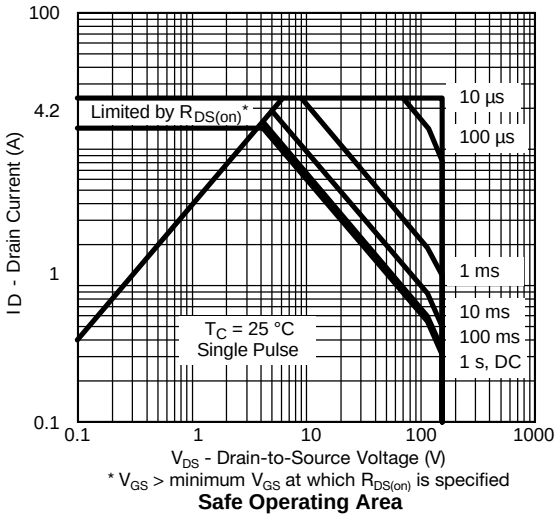


Source-Drain Diode Forward Voltage

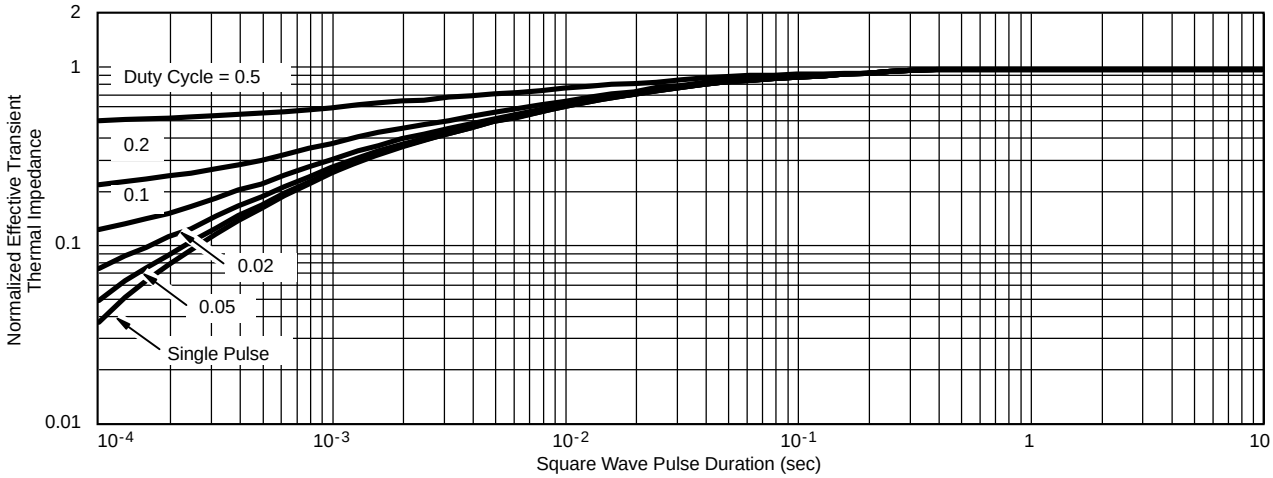
THERMAL RATINGS



Maximum Avalanche Drain Current vs. Case Temperature



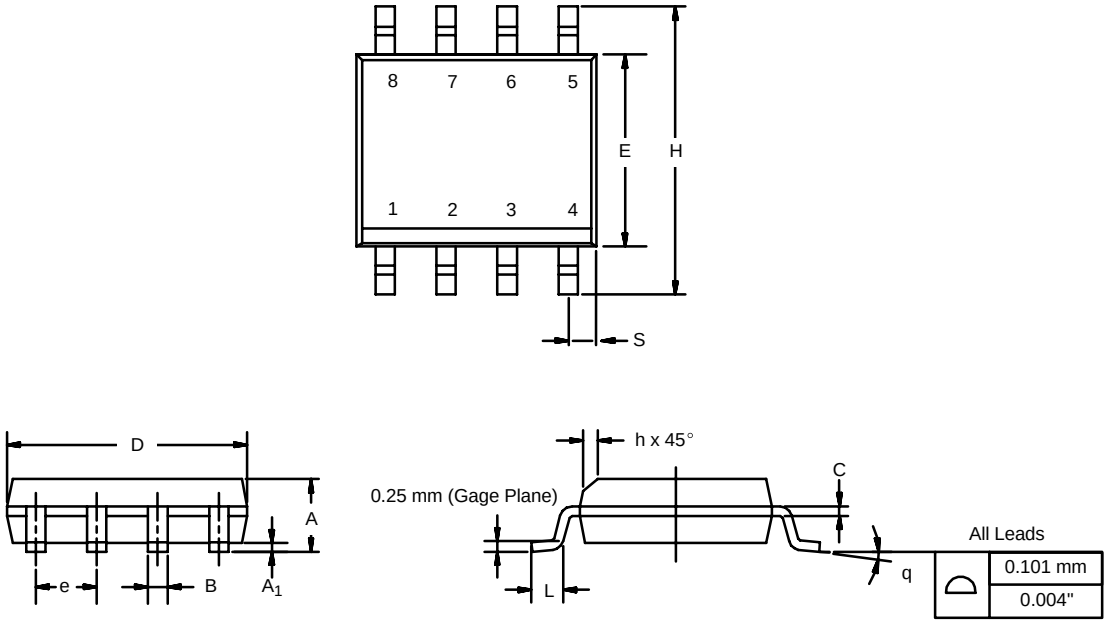
Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Case

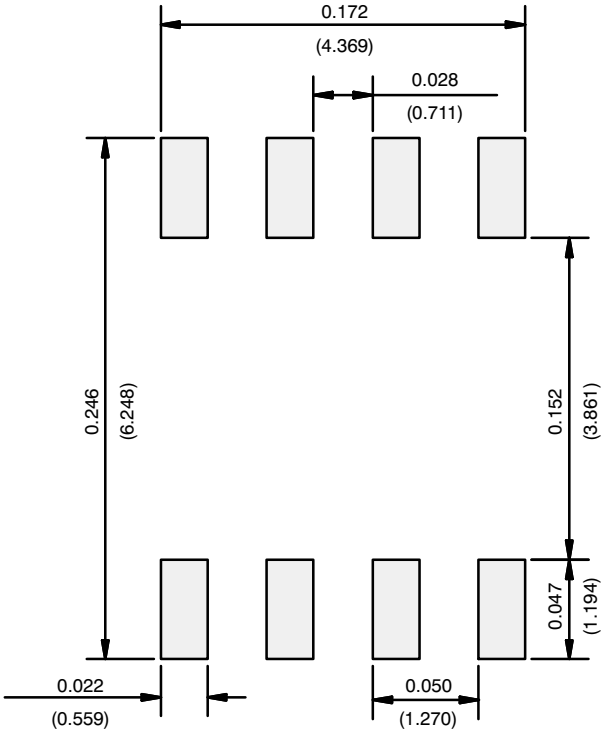
SOIC (NARROW): 8-LEAD

JEDEC Part Number: MS-012



DIM	MILLIMETERS		INCHES	
	Min	Max	Min	Max
A	1.35	1.75	0.053	0.069
A_1	0.10	0.20	0.004	0.008
B	0.35	0.51	0.014	0.020
C	0.19	0.25	0.0075	0.010
D	4.80	5.00	0.189	0.196
E	3.80	4.00	0.150	0.157
e	1.27 BSC		0.050 BSC	
H	5.80	6.20	0.228	0.244
h	0.25	0.50	0.010	0.020
L	0.50	0.93	0.020	0.037
q	0°	8°	0°	8°
S	0.44	0.64	0.018	0.026
ECN: C-06527-Rev. I, 11-Sep-06 DWG: 5498				

RECOMMENDED MINIMUM PADS FOR SO-8



Recommended Minimum Pads
Dimensions in Inches/(mm)

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