DIGITRON™ Semiconductors

High-reliability discrete products
and engineering services since 1977

2N6849

N- CHANNEL MOSFET

FEATURES

- Available as “HR” (high reliability) screened per MIL-PRF-19500, JANTX level. Add “HR” suffix to base part number.
- Available as non-RoHS (Sn/Pb plating), standard, and as RoHS by adding “-PBF” suffix.

MAXIMUM RATINGS.

Rating	Symbol	Value	Unit
Operating and Storage Temperature Range	T_J, T_{stg}	-55 to +150	°C
Thermal Resistance Junction To Case	$R_{\theta JC}$	5.0	°C/W
Total Power Dissipation @ T_A = 25°C **Derate above 25°C** (1)	P_T	0.8 25	mW mW/°C
Drain Source Voltage	V_{DS}	-100	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current @ T_C = +25°C (2)	I_{D1}	-6.5	A
Drain Current @ T_C = +100°C (2)	I_{D2}	-4.1	A
Off State Current(Peak Total Value)(3)	I_{DM}	-25	A(pk)
Source Current	I_S	-6.5	A

Notes: Derate linearly 0.2W/°C for T_C > 25°C.
Note 2: The following formula derives the maximim theoretic I_D limit. I_D is also limited by poackage and internal wires and may be limited due to pin diameter.

$$I_D = \sqrt{\frac{T_{J(max)} - T_C}{R_{\theta JC} \times R_{DS(on)} @ T_{J(max)}}}$$

Note 3: I_{DM} = 4 x I_{D1} as calculated in Note 2

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

Characteristics	Symbol	Min	Max	Unit
OFF CHARACTERISTICS				
Drain-Source Breakdown Voltage V_{GS} = 0V, I_D = -1.0mA	$V_{(BR)DSS}$	-100	-	V
Gate-Source Voltage (Threshold) $V_{DS} \geq V_{GS}$. I_D = -0.25mA $V_{DS} \geq V_{GS}$. I_D = -0.25mA, T_J = +125°C $V_{DS} \geq V_{GS}$. I_D = -0.25mA, T_J = -55°C	 $V_{GS(th)1}$ $V_{GS(th)2}$ $V_{GS(th)3}$	 -2.0 -1.0 -	 -4.0 - -5.0	V
Gate Current V_{GS} = ±20V, V_{DS} = 0V V_{GS} = ±20V, V_{DS} = 0V, T_J = +125°C	 I_{GSS1} I_{GSS2}	 - -	 ±100 ±200	nA
Drain Current V_{GS} = 0V, V_{DS} = -80V	I_{DSS1}	-	-25	µA
Drain Current V_{GS} = 0V, V_{DS} = -80V, T_J = +125°C	I_{DSS2}	-	-0.25	mA
Static Drain-Source On-State Resistance V_{GS} = -10V, I_D = -4.1A pulsed	$r_{DS(on)1}$	-	0.30	Ω
Static Drain-Source On-State Resistance V_{GS} = -10V, I_D = -6.5A pulsed	$r_{DS(on)2}$	-	0.32	Ω
Static Drain-Source On-State Resistance T_J = 125°C V_{GS} = -10V, I_D = -4.1A pulsed	$r_{DS(on)1}$	-	0.54	Ω
Diode Forward Voltage V_{GS} = 0V, I_D = -6.5A pulsed	V_{SD}	-	-4.3	V
DYNAMIC CHARACTERISTICS				

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On-State Gate Charge V_{GS} = -10V, I_D = -6.5A, V_{DS} = -50V	$Q_{g(on)}$	-	34.8	nC
Gate to Source Charge V_{GS} = -10V, I_D = -6.5A, V_{DS} = -50V	Q_g	-	6.8	nC
Gate to Drain Charge V_{GS} = -10V, I_D = -6.5A, V_{DS} = -50V	Q_{gd}	-	23.1	nC

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

Characteristics	Symbol	Min	Max	Unit
SWITCHING CHARACTERISTICS				
Turn-On Delay Time I_D = -6.5A, V_{GS} = -10V. R_G = 7.5Ω, V_{DD} = -40V	$t_{d(on)}$	-	60	ns
Rinse Time I_D = -6.5A, V_{GS} = -10V. R_G = 7.5Ω, V_{DD} = -40V	t_r	-	140	ns
Turn-off Delay Time I_D = -6.5A, V_{GS} = -10V. R_G = 7.5Ω, V_{DD} = -40V	$t_{d(off)}$	-	140	ns
Fall Time I_D = -6.5A, V_{GS} = -10V. R_G = 7.5Ω, V_{DD} = -40V	t_f	-	140	ns
Diode Reverse Recovery Time Di/dt ≤ -100A/µs, V_{DD} = ≤ -50V, I_F = -6.5A	t_{rr}	-	250	ns

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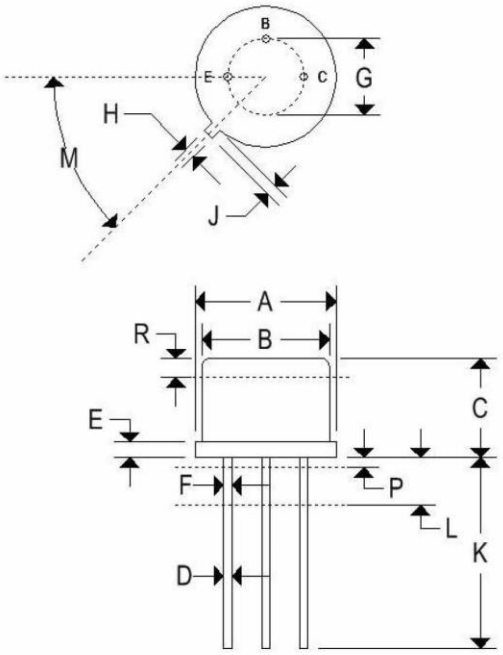
MECHANICAL CHARACTERISTICS

Case:	TO-39
Marking:	Alpha-numeric
Pin out:	See below



	TO-39			
	Inches		Millimeters	
	Min	Max	Min	Max
A	0.350	0.370	8.890	9.400
B	0.315	0.335	8.000	8.510
C	0.240	0.260	6.10	6.60
D	0.016	0.021	0.406	0.533
E	0.009	0.125	0.2269	3.180
F	0.016	0.019	0.406	0.533
G	0.190	0.210	4.830	5.33
H	0.028	0.034	0.711	0.864
J	0.029	0.040	0.737	1.020
K	0.500	-	12.700	-
L	0.250	-	6.350	-
M	45° NOM		45° NOM	
P	-	0.050	-	1.270
Q	90° NOM		90° NOM	
R	0.100	-	2.540	-

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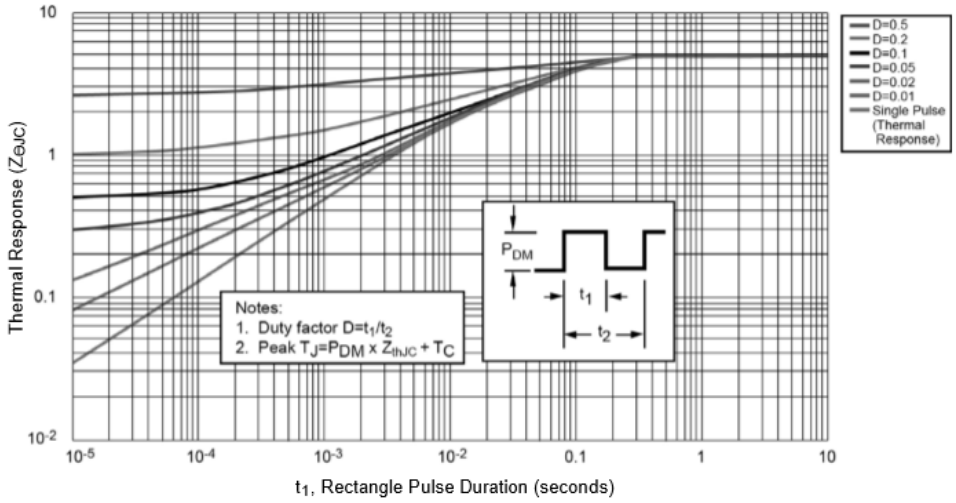

FIGURE 1 – Normalized Transient Thermal Impedance

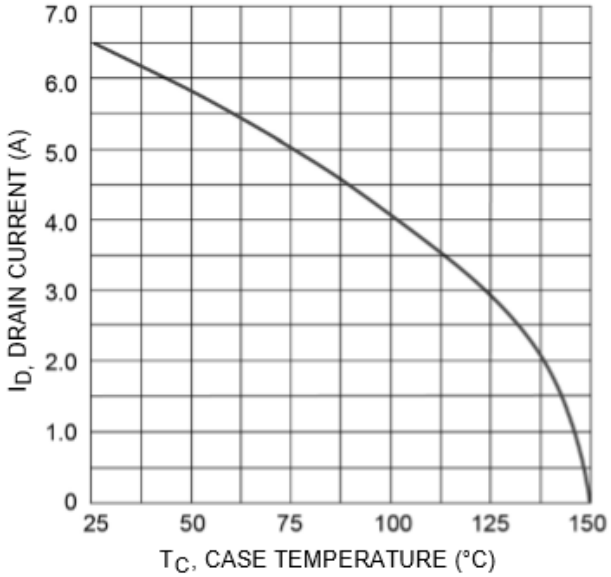

FIGURE 2 – Maximum Drain Current vs Case Temperature

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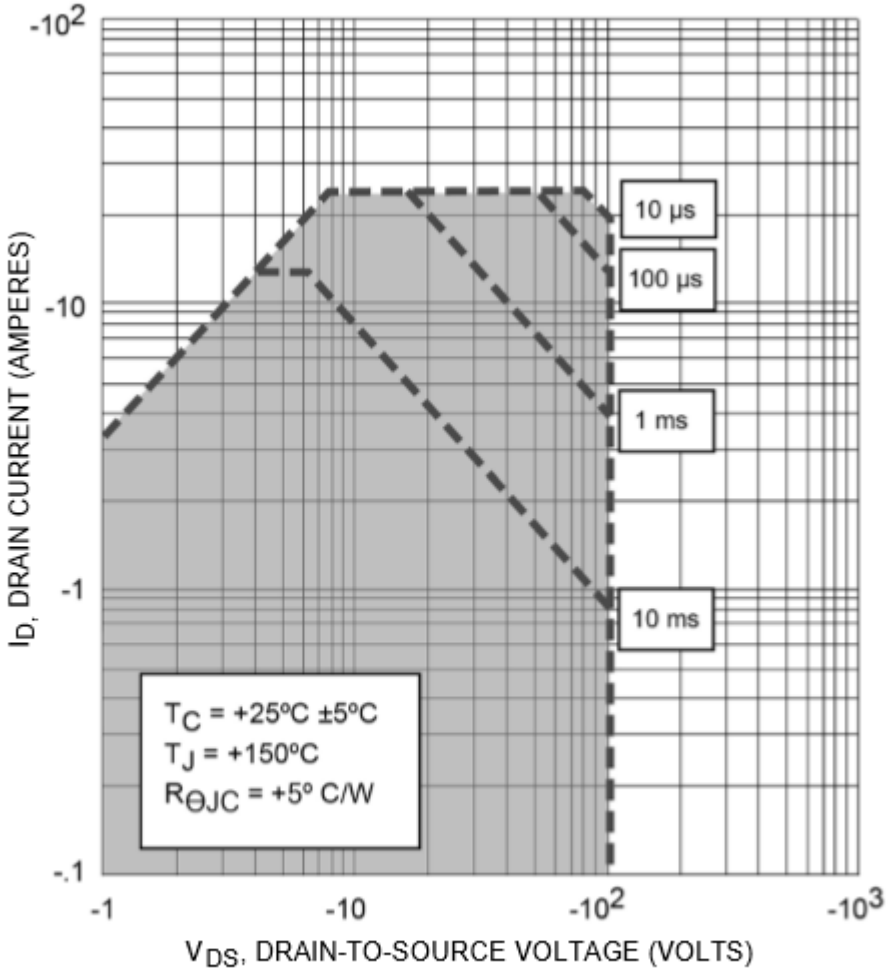

FIGURE 3 – Maximum Safe Operating Area