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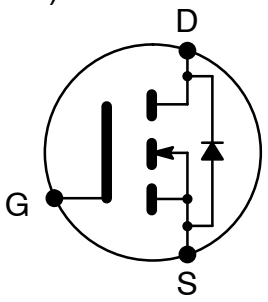
NTE2947 & NTE2947F
MOSFET
N–Channel, Enhancement Mode High Speed Switches
TO–220 Type Package

Features:
- Available in Standard TO–220 (NTE2947) and TO–220 Full Pack (NTE2947F)
- $R_{DS(on)}$ = 220 mΩ (Typ) @ V_{GS} = 10V, I_D = 9A
- Low Gate Charge (Typ 45nC)
- Low C_{rss} (Typ 25pF)
- 100% Avalanche Tested



Applications:
- LCD/LED/PDP TV
- Lighting
- Uninterruptible Power Supply

Absolute Maximum Ratings:

Drain–Source Voltage, V_{DSS} 500V
Gate–Source Voltage, V_{GS} . . . .±30V
Drain Current, Continuous (Note 1), I_D
  T_C = +25°C 18A
  T_C = +100°C 10.8A
Drain Current, Pulsed (Note 1, Note 2), I_{DM} 72A
Avalanche Current (Note 2), I_{AS} 18A
Single Pulsed Avalanche Energy (Note 3), E_{AS} 945mJ
Repetitive Avalanche Energy (Note 2), E_{AR} 23.5mJ
Peak Diode Recovery (Note 4), dv/dt 4.5V/ns
Total Power Dissipation, (T_C = +25°C), P_D
  NTE2947 . . . . . 235W
    Derate Above 25°C . . . . . 1.88W/°C
  NTE2947F 38.5W
    Derate Above 25°C . . . . . 0.3W/°C
Operating Junction Temperature Range, T_J . . . . . –55° to +150°C
Storage Temperature Range, T_{stg} . . . . . –55° to +150°C
Maximum Lead Temperature (During Soldering, 1/8” from case, 5sec), T_L . . . . . +300°C
Maximum Thermal Resistance, Junction–to–Case, R_{thJC}
  NTE2947 . . . . . 0.53°C/W
  NTE2947F . . . . . 3.3°C/W
Maximum Thermal Resistance, Junction–to–Ambient, R_{thJA} 62.5K/W

Note 1. Drain current limited by maximum junction temperature (TO–220 Full Pack **ONLY**).
Note 2. Repetitive Rating: Pulse width limited by maximum junction temperature.
Note 3. L = 5.2mH, IAS = 18, V_{DD} = 50V, R_G = 25Ω, Starting T_J = +25°C.
Note 4. I_{SD} ≤ 18A, di/dt ≤ 200Aμs, V_{DD} ≤ BV_{DSS}, starting T_J = +25°C

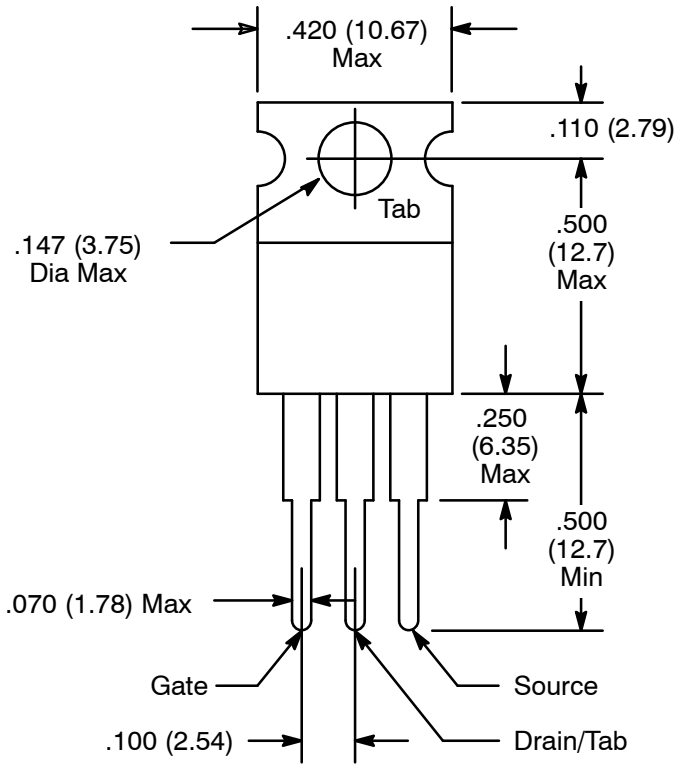
RoHS 2002/95/EC

Electrical Characteristics: (T_C = +25°C unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF Characteristics						
Drain–Source Breakdown Voltage	BV_{DSS}	V_{GS} = 0v, I_D = 250μA	500	–	–	V
Breakdown Voltage Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	I_D = 250μA, Referenced to 25°C	–	0.5	–	V/°C
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 500V, V_{GS} = 0V	–	–	1	μA
Gate–Body Leakage Current Forward	I_{GSSF}	V_{GS} = 30V, V_{DS} = 0V	–	–	100	nA
Gate–Body Leakage Current Reverse	I_{GSSR}	V_{GS} = –30V, V_{DS} = 0V	–	–	–100	nA
		V_{DS} = 400V, T_C = +125°C	–	–	10	μA
On Characteristics						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	3.0	–	5.0	V
Static Drain–Source ON Resistance	$R_{DS(on)}$	V_{GS} = 10V, I_D = 9A	–	0.220	0.265	Ω
Forward Transconductance	g_{fs}	V_{DS} = 40V, I_D = 9A	–	25	–	S
Dynamic Characteristics						
Input Capacitance	C_{iss}	V_{DS} = 25V, V_{GS} =0V, f = 1MHz	–	2200	2860	pF
Output Capacitance	C_{oss}		–	330	430	pF
Reverse Transfer Capacitance	C_{rss}		–	25	40	pF
Switching Characteristics						
Turn–On Delay Time	$t_{d(on)}$	V_{DD} = 250V I_D = 18A, V_{GS} = 10V, R_G = 25Ω, Note 5	–	55	120	ns
Turn–On Rise Time	t_r		–	165	340	ns
Turn–Off Delay Time	$t_{d(off)}$		–	95	200	ns
Turn–On Fall Time	t_f		–	90	190	ns
Total Gate Charge (Gate–Source Plus Gate–Drain)	Q_g	V_{DS} = 400V, I_D = 18A, V_{GS} = 10V, Note 5	–	45	60	nC
Gate–Source Charge	Q_{gs}		–	12.5	–	nC
Gate–Drain (“Miller”) Charge	Q_{gd}		–	19	–	nC
Source–Drain Diode Characteristics and Maximum Ratings						
Continuous Source Current	I_S	(Body Diode)	–	–	18	A
Pulse Source Current	I_{SM}	(Body Diode) Note 3	–	–	72	A
Diode Forward Voltage	V_{SD}	V_{GS} = 0V, I_S = 18A	–	–	1.4	V
Reverse Recovery Time	t_{rr}	V_{GS} = 0V, I_S = 18A, dI_F/dt = 100A/μs	–	500	–	ns
Reverse Recovery Charge	t_{rr}		–	5.4	–	μC

Note 3. L = 5.2mH, IAS = 18, V_{DD} = 50V, R_G = 25Ω, Starting T_J = +25°C.
Note 5. Essentially independent of operating temperature typical characteristics.

NTE2947 (TO−220)



NTE2947F (TO−220 Full Pack)