

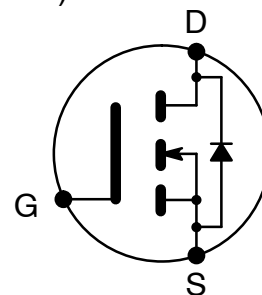
NTE2947 & NTE2947F MOSFET N-Channel, Enhancement Mode High Speed Switches TO-220 Type Package

Features:

- Available in Standard TO-220 (NTE2947) and TO-220 Full Pack (NTE2947F)
- $R_{DS(on)} = 220 \text{ m}\Omega$ (Typ) @ $V_{GS} = 10\text{V}$, $I_D = 9\text{A}$
- 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}	$\pm 30\text{V}$
Drain Current, Continuous (Note 1), I_D	
$T_C = +25^\circ\text{C}$	18A
$T_C = +100^\circ\text{C}$	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, ($T_C = +25^\circ\text{C}$), P_D	
NTE2947	235W
Derate Above 25°C	1.88W/ $^\circ\text{C}$
NTE2947F	38.5W
Derate Above 25°C	0.3W/ $^\circ\text{C}$
Operating Junction Temperature Range, T_J	-55° to $+150^\circ\text{C}$
Storage Temperature Range, T_{stg}	-55° to $+150^\circ\text{C}$
Maximum Lead Temperature (During Soldering, 1/8" from case, 5sec), T_L	$+300^\circ\text{C}$
Maximum Thermal Resistance, Junction-to-Case, R_{thJC}	
NTE2947	0.53 $^\circ\text{C/W}$
NTE2947F	3.3 $^\circ\text{C/W}$
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. $L = 5.2\text{mH}$, $I_{AS} = 18$, $V_{DD} = 50\text{V}$, $R_G = 25\Omega$, Starting $T_J = +25^\circ\text{C}$.

Note 4. $I_{SD} \leq 1.8\text{A}$, $di/dt \leq 200\text{A}/\mu\text{s}$, $V_{DD} \leq V_{DSS}$, starting $T_J = +25^\circ\text{C}$

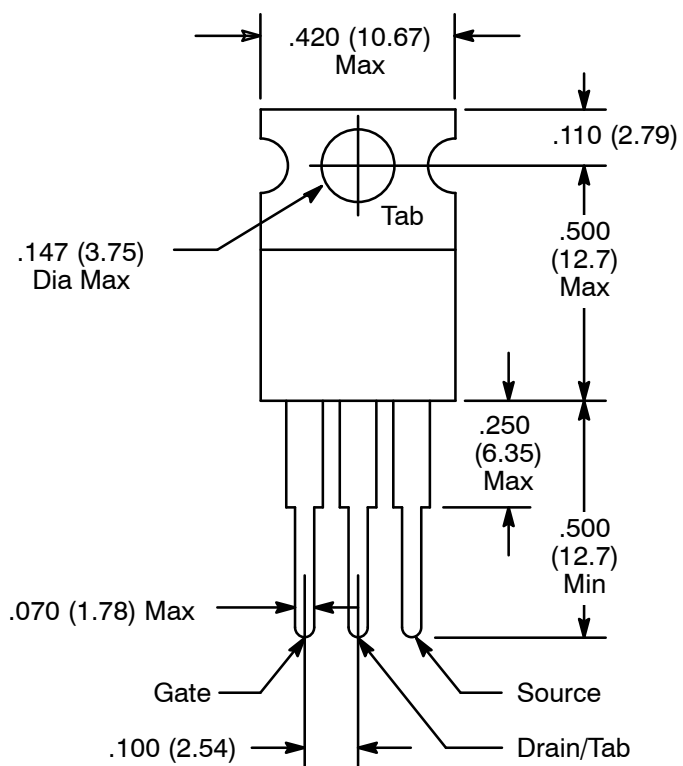
Electrical Characteristics: ($T_C = +25^{\circ}\text{C}$ unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
OFF Characteristics						
Drain–Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0V, I_D = 250\mu A$	500	–	–	V
Breakdown Voltage Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	$I_D = 250\mu A$, 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
		$V_{DS} = 400V, T_C = +125^\circ C$	–	–	10	μA
On Characteristics						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	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	$t_{d(on)}$	$V_{DD} = 250V, I_D = 18A, V_{GS} = 10V, R_G = 25\Omega$, 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}	$V_{GS} = 0V, I_S = 18A, di_F/dt = 100A/\mu s$	–	500	–	ns
Reverse Recovery Charge	t_{rr}		–	5.4	–	μC

Note 3. $L = 5.2\text{mH}$, $I_{AS} = 18$, $V_{DD} = 50V$, $R_G = 25\Omega$, Starting $T_J = +25^{\circ}\text{C}$.

Note 5. Essentially independent of operating temperature typical characteristics.

NTE2947 (TO-220)



NTE2947F (TO-220 Full Pack)

