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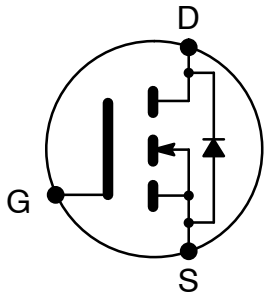
RoHS 2002/95/EC

NTE2915
MOSFET
N–Channel, Enhancement Mode
High Speed Switch
TO220 Type Package

Features:
- Low Gate–to–Drain Charge to Reduce Switching Losses
- Fully Characterized Capacitance Including Effective C_{OSS} to Simplify Design
- Fully Characterized Avalanche Voltage and Current



Applications:
- High Frequency DC–DC Converters

Absolute Maximum Ratings:

Continuous Drain Current (V_{GS} = 10V), I_D
- T_C = +25°C 31A
- T_C = +100°C 21A

Pulsed Drain Current (Note 1), I_{DM} 124A

Power Dissipation (T_C = +25°C), P_D 200W
- Linear Derating Factor . . . . . 1.3W/°C

Gate–Source Voltage, V_{GS} . . . . . ±30V

Peak Diode Recovery dv/dt (Note 2), dv/dt 5.9V/ns

Single Pulse Avalanche Energy (Note 3), E_{AS} 420mJ

Avalanche Current (Note 1), I_{AR} 18A

Repetitive Avalanche Energy (Note 1), E_{AR} 20mJ

Operating Junction Temperature Range, T_J . . . . . –55° to +175°C

Storage Temperature Range, T_{stg} . . . . . –55° to +175°C

Lead Temperature (During Soldering, 1.6mm from Case, 10 sec max.), T_L . . . . . +300°C

Maximum Thermal Resistance, Junction–to–Case, R_{thJC} . . . . . 0.75°C/W

Typical Thermal Resistance, Case–to–Sink (Flat, Greased Surface), R_{thCS} . . . . . 0.5°C/W

Maximum Thermal Resistance, Junction–to–Ambient, R_{thJA} . . . . . 62°C/W

Note 1. Repetitive rating: pulse width limited by maximum channel temperature.
Note 2. $I_{SD} \le 18A$, $di/dt \le 110A/s$, $V_{DD} \le V_{(BR)DSS}$, T_J +175°C.
Note 3. Starting T_J = +25°C, L = 3.8mH, R_G = 25Ω, I_{AS} = 18A.

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Static Characteristics						
Drain−to−Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = 250μA	200	–	–	V
Breakdown Voltage Temperature Coefficient	$\pm V_{(BR)DSS}/\pm T_J$	Reference to +25°C, I_D = 1mA	–	0.25	–	V/°C
Static Drain−to−Source On−Resistance	$R_{DS(on)}$	V_{GS} = 10V, I_D = 18A, Note 4	–	–	0.082	Ω
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	3.0	–	5.5	V
Drain−Source Leakage Current	I_{DSS}	V_{DS} = 200V, V_{GS} = 0V	–	–	25	μA
		V_{DS} = 160V, V_{GS} = 0V, T_J = +150°C	–	–	250	μA
Gate−Source Leakage Current	I_{GSS}	V_{GS} = ±30V	–	–	±100	nA
Dynamic Characteristics						
Forward Transconductance	g_{fs}	V_{DS} = 50V, I_D = 18A	17	–	–	S
Total Gate Charge	Q_g	I_D = 18A, V_{DS} = 160V, V_{GS} = 10V, Note 4	–	70	110	nC
Gate−to−Source Charge	Q_{gs}		–	18	27	nC
Gate−to−Drain (“Miller”) Charge	Q_{gd}		–	33	49	nC
Turn−On Delay Time	$t_{d(on)}$	V_{DD} = 100V, I_D = 18A, R_G = 2.5Ω, R_D = 4.5Ω, Note 4	–	16	–	ns
Rise Time	t_r		–	38	–	ns
Turn−Off Delay Time	$t_{d(off)}$		–	26	–	ns
Fall Time	t_f		–	10	–	ns
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 25V, f = 1MHz	–	2370	–	pF
Output Capacitance	C_{oss}		–	390	–	pF
Reverse Transfer Capacitance	C_{rss}		–	78	–	pF
Output Capacitance	C_{oss}	V_{GS} = 0V, V_{DS} = 1V, f = 1MHz	–	2860	–	pF
		V_{GS} = 0V, V_{DS} = 160V, f = 1MHz	–	150	–	pF
Effective Output Capacitance	C_{oss} eff.	V_{GS} = 0V, V_{DS} = 0V to 160V, Note 5	–	170	–	pF

Note 4. Pulse width ≤ 300μs; duty cycle ≤ 2%.

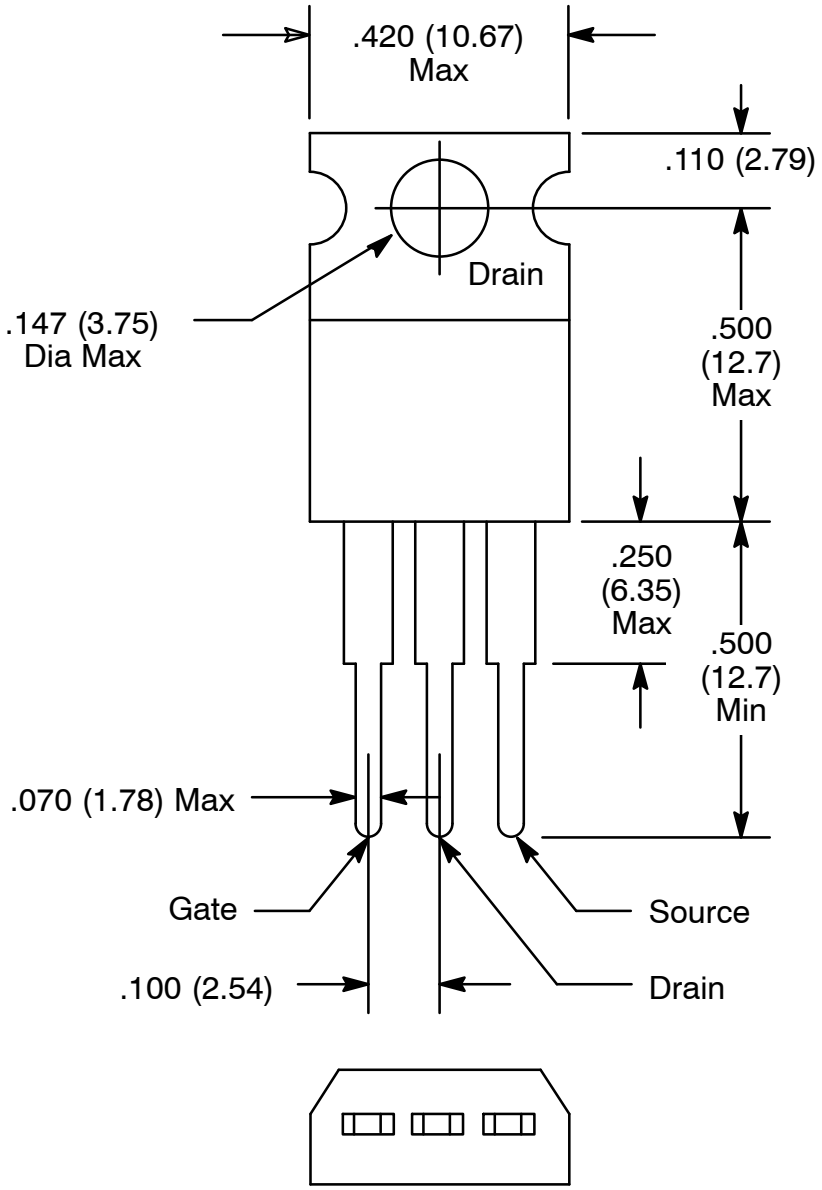
Note 5. C_{OSS} eff. is a fixed capacitance that gives the same charging time as C_{OSS} while V_{DS} is rising from 0 to 80% V_{DSS}.

Source−Drain Ratings and Characteristics:

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Continuous Source Current (Body Diode)	I_S		–	–	31	A
Pulsed Source Current (Body Diode)	I_{SM}	Note 1	–	–	124	A
Diode Forward Voltage	V_{SD}	I_S = 18A, V_{GS} = 0V, T_J = +25°C, Note 4	–	–	1.3	V
Reverse Recovery Time	t_{rr}	T_J = +25°C, I_F = 18A, di/dt = 100A/μs, Note 4	–	200	300	ns
Reverse Recovery Charge	Q_{rr}		–	1.7	2.6	μC
Forward Turn−On Time	t_{on}	Intrinsic turn−on time is negligible (turn−on is dominated by L_S + L_D)				

Note 1. Repetitive rating: pulse width limited by maximum channel temperature.

Note 4. Pulse width ≤ 300μs; duty cycle ≤ 2%.


.420 (10.67)
Max
.110 (2.79)
Drain
.147 (3.75)
Dia Max
.500
(12.7)
Max
.250
(6.35)
Max
.500
(12.7)
Min
.070 (1.78) Max
Gate
Source
.100 (2.54)
Drain