



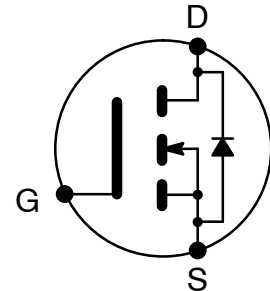
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## NTE2916 MOSFET N-Ch, Enhancement Mode High Speed Switch TO247 Type Package

**Features:**

- Advanced Process Technology
- Dynamic dv/dt Rating
- +175°C Operating Temperature
- Fast Switching
- Fully Avalanche Rated
- Ease of Paralleling



**Description:**

The NTE2916 Power MOSFET utilizes advanced processing techniques to achieve extremely low on-resistance per silicon area. This benefit, combined with the fast switching speed and ruggedized device design provides the designer with an extremely efficient and reliable device for use in a wide variety of applications.

The TO247 package is preferred for commercial-industrial applications where higher power levels preclude the use of TO220 devices. The TO247 is similar, but superior, to the TO218 package because of its isolated mounting hole.

**Absolute Maximum Ratings:**

Continuous Drain Current ( $V_{GS} = 10V$ ), $I_D$	
$T_C = +25^\circ C$ .....	50A
$T_C = +100^\circ C$ .....	35A
Pulsed Drain Current (Note 1), $I_{DM}$ .....	200A
Power Dissipation ( $T_C = +25^\circ C$ ), $P_D$ .....	300W
Derate Linearly Above 25°C .....	2.0W/°C
Gate-to-Source Voltage, $V_{GS}$ .....	±20
Single Pulse Avalanche Energy (Note 2), $E_{AS}$ .....	560mJ
Avalanche Current (Note 1), $I_{AR}$ .....	50A
Repetitive Avalanche Energy (Note 1), $E_{AR}$ .....	30mJ
Peak Diode Recovery dv/dt (Note 3), dv/dt .....	10V/ns
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 for 10sec), $T_L$ .....	+300°C
Mounting Torque (6-32 or M3 Screw) .....	10 lbf•in (1.1N•m)
Thermal Resistance, Junction-to-Case, $R_{thJC}$ .....	0.50°C/W
Thermal Resistance, Junction-to-Ambient, $R_{thJA}$ .....	40°C/W
Typical Thermal Resistance, Case-to-Sink (Flat, Greased Surface), $R_{thCS}$ .....	0.24°C/W

Note 1. Repetitive rating; pulse width limited by maximum junction temperature.

Note 2. Starting  $T_J = +25^\circ C$ ,  $L = 1.5mH$ ,  $R_G = 25\Omega$ ,  $I_{AS} = 28A$

Note 3.  $I_{SD} \leq 28A$ ,  $di/dt \leq 486A/\mu s$ ,  $V_{DD} \leq V_{(BR)DSS}$ ,  $T_J \leq +175^\circ C$

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

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\pm A$	200	-	-	V
Breakdown Voltage Temp. Coefficient	$\frac{V_{(BR)DSS}}{T_J}$	Reference to $+25^\circ\text{C}$ , $I_D = 1\text{mA}$	-	0.26	-	$V/^\circ\text{C}$
Static Drain-to-Source On-Resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 28A$ , Note 4	-	-	0.04	$\Omega$
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	2.0	-	4.0	V
Forward Transconductance	$g_{fs}$	$V_{DS} = 50V, I_D = 28A$	27	-	-	mhos
Drain-to-Source Leakage Current	$I_{DSS}$	$V_{DS} = 200V, V_{GS} = 0V$	-	-	25	$\mu A$
		$V_{DS} = 160V, V_{GS} = 0V, T_J = +150^\circ\text{C}$	-	-	250	$\mu A$
Gate-to-Source Forward Leakage	$I_{GSS}$	$V_{GS} = 20V$	-	-	100	nA
Gate-to-Source Reverse Leakage	$I_{GSS}$	$V_{GS} = -20V$	-	-	-100	nA
Total Gate Charge	$Q_g$	$I_D = 28A, V_{DS} = 160V, V_{GS} = 10V$ , Note 4	-	-	234	nC
Gate-to-Source Charge	$Q_{gs}$		-	-	38	nC
Gate-to-Drain ("Miller") Charge	$Q_{gd}$		-	-	110	nC
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = 100V, I_D = 28A, R_G = 1.8\Omega$ , $V_{GS} = 10V$ , Note 4	-	17	-	ns
Rise Time	$t_r$		-	60	-	ns
Turn-Off Delay Time	$t_{d(off)}$		-	55	-	ns
Fall Time	$t_f$		-	48	-	ns
Internal Drain Inductance	$L_D$	Between lead, .250in. (6.0) mm from package and center of die contact	-	5.0	-	nH
Internal Source Inductance	$L_S$		-	13	-	nH
Input Capacitance	$C_{iss}$	$V_{GS} = 0V, V_{DS} = 25V, f = 1\text{MHz}$	-	4057	-	pF
Output Capacitance	$C_{oss}$		-	603	-	pF
Reverse Transfer Capacitance	$C_{riss}$		-	161	-	pF

Note 4. Pulse width  $\leq 400\mu\text{s}$ ; duty cycle  $\leq 2\%$ .

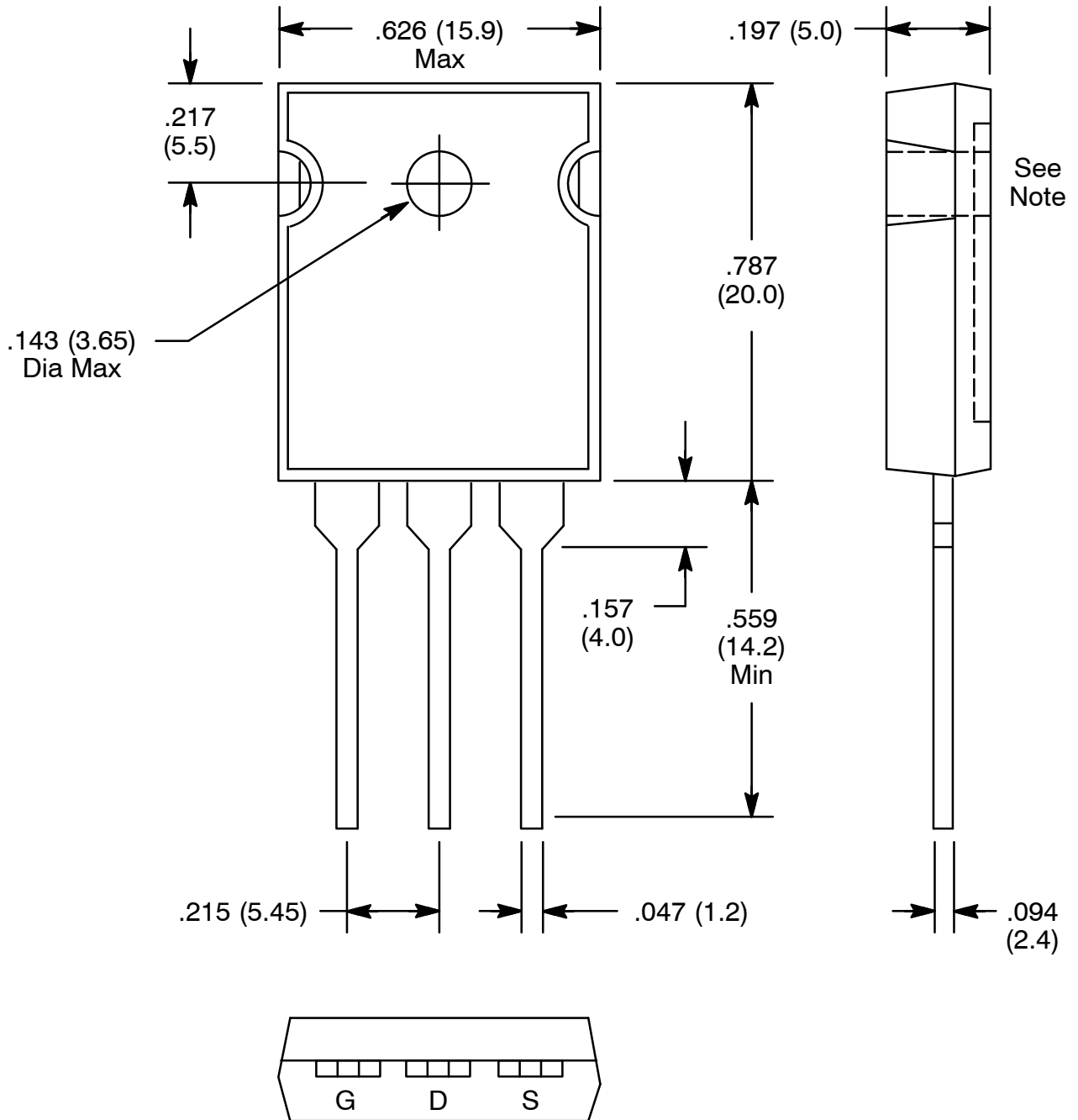
**Source-Drain Ratings and Characteristics:**

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Continuous Source Current (Body Diode)	$I_S$	Note 5	-	-	50	A
Pulsed Source Current (Body Diode)	$I_{SM}$	Note 1	-	-	200	A
Diode Forward Voltage	$V_{SD}$	$T_J = +25^\circ\text{C}, I_S = 28A, V_{GS} = 0V$ , Note 4	-	-	1.3	V
Reverse Recovery Time	$t_{rr}$	$T_J = +25^\circ\text{C}, I_F = 28A$ , $di/dt = 100A/\mu\text{s}$ , Note 4	-	268	402	ns
Reverse Recovery Charge	$Q_{rr}$		-	1.9	2.8	$\mu\text{C}$
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 junction temperature.

Note 4. Pulse width  $\leq 400\mu\text{s}$ ; duty cycle  $\leq 2\%$ .

Note 5. Calculated continuous current based on maximum allowable junction temperature.



**Note:** Drain connected to metal part of mounting surface.