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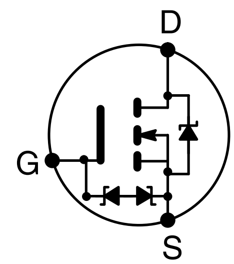
NTE2995
MOSFET
N−Channel, Enhancement Mode
High Speed Switch

Features:
- $R_{DS(on)}$ = 0.65Ω Typical
- Extremely High dv/dt Capability
- Gate Charge Minimized
- Gate−to−Source Zener Diode Protected



Applications:
- High Current, High Speed Switching
- Ideal for Off−Line Power Supplies, Adaptor and PFC
- Lighting

Absolute Maximum Ratings:

Drain−Source Voltage (V_{GS} = 0), V_{DS}	600V
Drain−Gate Voltage (R_{GS} = 20kΩ), V_{DGR}	600V
Gate−Source Voltage, V_{GS}	±30V
Drain Current, I_D	
Continuous	
T_C = +25°C	10A
T_C = +100°C	5.7A
Pulsed (Note 1)	36A
Total Power Dissiption (T_C = +25°C), P_{TOT}	115W
Derate Above +25°C	0.92W/°C
Gate−Source ESD Voltage (HBM C = 100pF, R = 1.5kΩ), $V_{esd(G-S)}$	4000V
Peak Diode Recovery Voltage Slope (Note 2), dv/dt	4.5V/ns
Avalanche Current, Repetitive or Non−Repetitive (Pulse Width Limited by $T_J$max), I_{AR}	9A
Single Pulse Avalanche Energy (Starting T_J = +25°C, I_D = I_{AR}, V_{DD} = 50V), E_{AS}	300mJ
Repetitive Avalanche Energy (Pulse Width Limited by $T_J$max), E_{AR}	3.5mJ
Minimum Gate−Source Breakdown Voltage (I_{GS} = ±1mA, Open Drain, Note 3), $V_{(BR)GSO}$	30V
Operating Junction Temperature Range, T_J	−55° to +150°C
Storage Temperature Range, T_{stg}	−55° to +150°C
Thermal Resistance, Junction−to−Case, R_{thJC}	1.09°C/W
Thermal Resistance, Junction−to−Ambient, R_{thJA}	62.5°C/W
Lead Temperature (During Soldering), T_L	+300°C

Note 1. Pulse width limited by safe operating area.
Note 2. $I_{SD} \leq$ 10A, di/dt ≤ 200A/µs, $V_{DD} \leq V_{(BR)DSS}$, $T_J \leq T_J$max.
Note 3. The built−in back−to−back Zener diodes have specifically been designed to enhance not only the device's ESD capability, but also to make them safely absorb possible voltage transients that may occasionally be applied from gate to source. In this respect their Zener voltage is appropriate to achieve an efficient and cost−effective intervention to protect the device's integrity. These integrated Zener diodes thus avoid the usage of external components.

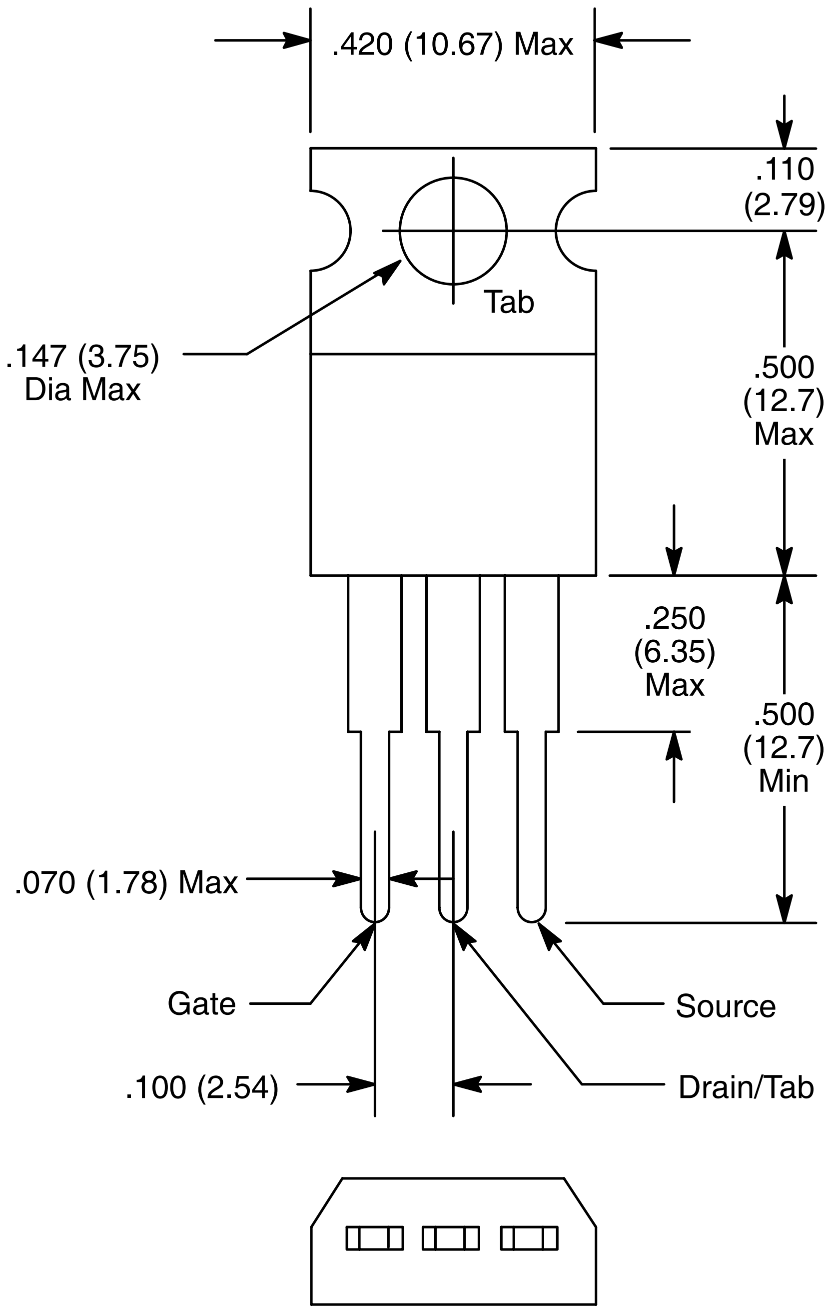
Electrical Characteristics: (T_C = +25°C unless otherwise specified)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
ON/OFF						
Drain–Source Breakdown Voltage	$V_{(BR)DSS}$	I_D = 250µA, V_{GS} = 0	600	–	–	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = Max Rating	–	–	1	µA
		V_{DS} = Max Rating, T_J = +125°C	–	–	50	µA
Gate Body Leakage Current	I_{GSS}	V_{GS} = ±15V, V_{DS} = 0	–	–	±10	µA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250µA	3.0	3.75	4.5	V
Static Drain–Source ON Resistance	$R_{DS(on)}$	V_{GS} = 10V, I_D = 4.5A	–	0.65	0.75	Ω
Dynamic						
Forward Transconductance	g_{fs}	V_{DS} = 15V, I_D = 4.5A, Note 4	–	7.8	–	S
Input Capacitance	C_{iss}	V_{DS} = 25V, f = 1MHz, V_{GS} = 0	–	1370	–	pF
Output Capacitance	C_{oss}		–	156	–	pF
Reverse Transfer Capacitance	C_{rss}		–	37	–	pF
Equivalent Output Capacitance	$C_{oss\ eq.}$	V_{GS} = 0, V_{DS} = 0V to 480V, Note 5	–	90	–	pF
Total Gate Charge	Q_g	V_{DD} = 480V, I_D = 8A, V_{GS} = 10V	–	50	70	nC
Gate–Source Charge	Q_{gs}		–	10	–	nC
Gate–Drain Charge	Q_{gd}		–	25	–	nC
Switching ON/OFF						
Turn–On Delay Time	$t_{d(on)}$	V_{DD} = 300V, I_D = 4A, R_G = 4.7Ω, V_{GS} = 10V	–	20	–	ns
Rise Time	t_r		–	20	–	ns
Turn–Off Delay Time	$t_{d(off)}$		–	55	–	ns
Fall Time	t_f		–	30	–	ns
Off–Voltage Rise Time	$t_{r(Voff)}$	V_{DD} = 480V, I_D = 8A, R_G = 4.7Ω, V_{GS} = 10V	–	18	–	ns
Fall Time	t_f		–	18	–	ns
Crossover Time	t_c		–	36	–	ns
Source–Drain Diode						
Source–Drain Current	I_{SD}		–	–	10	A
Source–Drain Current, Pulsed	I_{SDM}	Note 1	–	–	36	A
Forward ON Voltage	V_{SD}	I_{SD} = 10A, V_{GS} = 0, Note 4	–	–	1.6	V
Reverse Recovery Time	t_{rr}	I_{SD} = 8A, di/dt = 100A/µs, V_{DD} = 40V, T_J = +150°C	–	570	–	ns
Reverse Recovery Charge	Q_{rr}		–	4.3	–	µC
Reverse Recovery Current	I_{RRM}		–	15	–	A

Note 1. Pulse width limited by safe operating area.

Note 4. Pulsed: pulse duration = 300µs, duty cycle 1.5%.

Note 5. $C_{oss\ eq.}$ is defined as a constant equivalent capacitance giving the same charging time as C_{oss} when V_{DS} increases from 0 to 80%.


.420 (10.67) Max
.110
(2.79)
Tab
.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/Tab