

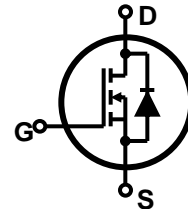
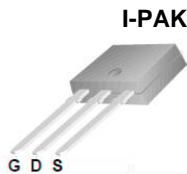
## Features

- Low gate charge
- 100% avalanche tested
- Improved dv/dt capability
- RoHS compliant
- Halogen free package
- JEDEC Qualification

$$V_{DSS} = 880 \text{ V @ } T_{jmax}$$

$$I_D = 3 \text{ A}$$

$$R_{DS(on)} = 4.2 \text{ (max) @ } V_{GS} = 10 \text{ V}$$



Device	Package	Marking	Remark
TMD3N80G/TMU3N80G	D-PAK/I-PAK	TMD3N80G/TMU3N80G	Halogen Free

## Absolute Maximum Ratings

Parameter	Symbol	TMD3N80G/TMU3N80G	Unit
Drain-Source Voltage	$V_{DSS}$	800	V
Gate-Source Voltage	$V_{GS}$	$\pm 30$	V
Continuous Drain Current	$I_D$	$T_C = 25 \text{ }^\circ\text{C}$	3
		$T_C = 100 \text{ }^\circ\text{C}$	1.83
Pulsed Drain Current (Note 1)	$I_{DM}$	12	A
Single Pulse Avalanche Energy (Note 2)	$E_{AS}$	283	mJ
Repetitive Avalanche Current (Note 1)	$I_{AR}$	3	A
Repetitive Avalanche Energy (Note 1)	$E_{AR}$	9.4	mJ
Power Dissipation	$P_D$	$T_C = 25 \text{ }^\circ\text{C}$	94
		Derate above $25 \text{ }^\circ\text{C}$	0.75
Peak Diode Recovery dv/dt (Note 3)	dv/dt	4.5	V/ns
Operating Junction and Storage Temperature Range	$T_J, T_{STG}$	-55~150	$^\circ\text{C}$
Maximum lead temperature for soldering purposes,	$T_L$	300	$^\circ\text{C}$

\* Limited only by maximum junction temperature

## Thermal Characteristics

Parameter	Symbol	TMD3N80G/TMU3N80G	Unit
Maximum Thermal resistance, Junction-to-Case	$R_{JC}$	1.33	$^\circ\text{C/W}$
Maximum Thermal resistance, Junction-to-Ambient	$R_{JA}$	110	$^\circ\text{C/W}$

## Electrical Characteristics : $T_C=25^\circ\text{C}$ , unless otherwise noted

Parameter	Symbol	Test condition	Min	Typ	Max	Units
<b>OFF</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS} = 0\text{ V}, I_D = 250\ \mu\text{A}$	800	--	--	V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 800\text{ V}, V_{GS} = 0\text{ V}$	--	--	10	$\mu\text{A}$
		$V_{DS} = 640\text{ V}, T_C = 125^\circ\text{C}$	--	--	100	$\mu\text{A}$
Forward Gate-Source Leakage Current	$I_{GSSF}$	$V_{GS} = 30\text{ V}, V_{DS} = 0\text{ V}$	--	--	100	nA
Reverse Gate-Source Leakage Current	$I_{GSSR}$	$V_{GS} = -30\text{ V}, V_{DS} = 0\text{ V}$	--	--	-100	nA

### ON

Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\ \mu\text{A}$	2	--	4	V
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS} = 10\text{ V}, I_D = 1.5\text{ A}$	--	3.36	4.2	
Forward Transconductance <sup>(Note 4)</sup>	$g_{FS}$	$V_{DS} = 30\text{ V}, I_D = 1.5\text{ A}$	--	3.7	--	S

### DYNAMIC

Input Capacitance	$C_{iss}$	$V_{DS} = 25\text{ V}, V_{GS} = 0\text{ V},$ $f = 1.0\text{ MHz}$	--	696	--	pF
Output Capacitance	$C_{oss}$		--	65	--	pF
Reverse Transfer Capacitance	$C_{rss}$		--	10.2	--	pF

### SWITCHING

Turn-On Delay Time <sup>(Note 4,5)</sup>	$t_{d(on)}$	$V_{DD} = 400\text{ V}, I_D = 3\text{ A},$ $R_G = 25$	--	48	--	ns
Turn-On Rise Time <sup>(Note 4,5)</sup>	$t_r$		--	36	--	ns
Turn-Off Delay Time <sup>(Note 4,5)</sup>	$t_{d(off)}$		--	106	--	ns
Turn-Off Fall Time <sup>(Note 4,5)</sup>	$t_f$		--	41	--	ns
Total Gate Charge <sup>(Note 4,5)</sup>	$Q_g$	$V_{DS} = 640\text{ V}, I_D = 3\text{ A},$ $V_{GS} = 10\text{ V}$	--	19	--	nC
Gate-Source Charge <sup>(Note 4,5)</sup>	$Q_{gs}$		--	4	--	nC
Gate-Drain Charge <sup>(Note 4,5)</sup>	$Q_{gd}$		--	7.6	--	nC

### SOURCE DRAIN DIODE

Maximum Continuous Drain-Source Diode Forward Current	$I_S$	----	--	--	3	A
Maximum Pulsed Drain-Source Diode Forward Current	$I_{SM}$	----	--	--	12	A
Drain-Source Diode Forward Voltage	$V_{SD}$	$V_{GS} = 0\text{ V}, I_S = 3\text{ A}$	--	--	1.5	V
Reverse Recovery Time <sup>(Note 4)</sup>	$t_{rr}$	$V_{GS} = 0\text{ V}, I_S = 3\text{ A}$	--	372	--	ns
Reverse Recovery Charge <sup>(Note 4)</sup>	$Q_{rr}$	$dl_F / dt = 100\text{ A}/\mu\text{s}$	--	1.8	--	$\mu\text{C}$

Note :

1. Repeated rating : Pulse width limited by safe operating area
2.  $L = 59\text{ mH}, I_{AS} = 3\text{ A}, V_{DD} = 50\text{ V}, R_G = 25$  , Starting  $T_J = 25^\circ\text{C}$
3.  $I_{SD}$   $\mu\text{s}, V_{DD}$   $\mu\text{s}, V_{DS}$   $\mu\text{s}$ , Starting  $T_J = 25^\circ\text{C}$

5. Essentially Independent of Operating Temperature Typical Characteristics

