Features

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

V_{DSS} = 440 V @T_{jmax}
I_D = 2A
$R_{DS(on)}$ = 3.4 (max) @ V_{GS}= 10 V

Absolute Maximum Ratings

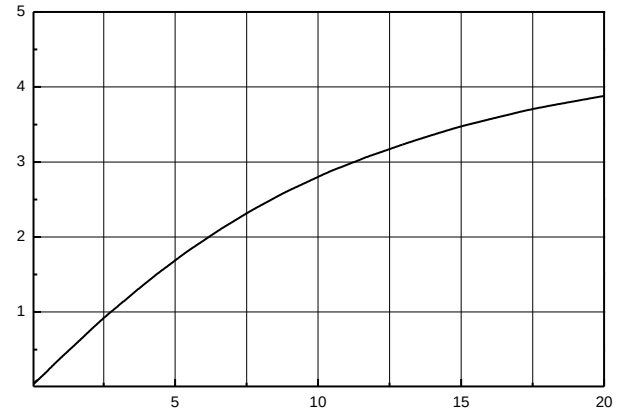
Parameter		Symbol	TMD3N40ZG/TMU3N40ZG	Unit
Drain-Source Voltage		V_{DS}	400	V
Gate-Source Voltage		V_{GS}	±30	V
Continuous Drain Current	T_C = 25 ℃	I_D	2.0*	A
	T_C = 100 ℃		1.2*	A
Pulsed Drain Current (Note 1)		I_{DM}	8*	A
Single Pulse Avalanche Energy (Note 2)		E_{AS}	46	mJ
Repetitive Avalanche Current (Note 1)		I_{AR}	2	A
Repetitive Avalanche Energy (Note 1)		E_{AR}	3	mJ
Power Dissipation	T_C = 25 ℃	P_D	30	W
	Derate above 25 ℃		0.24	W/℃
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	℃
Maximum lead temperature for soldering purposes, 1		T_L	300	℃

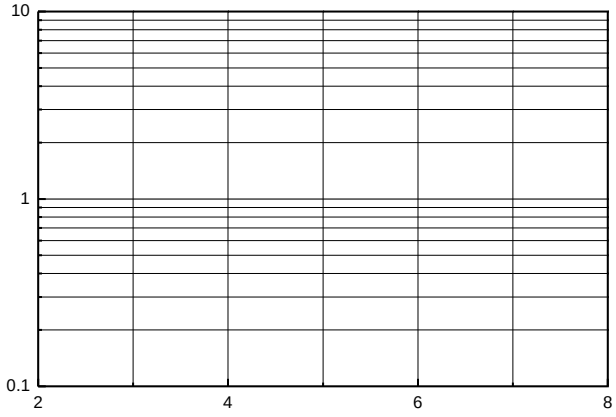
Thermal Characteristics

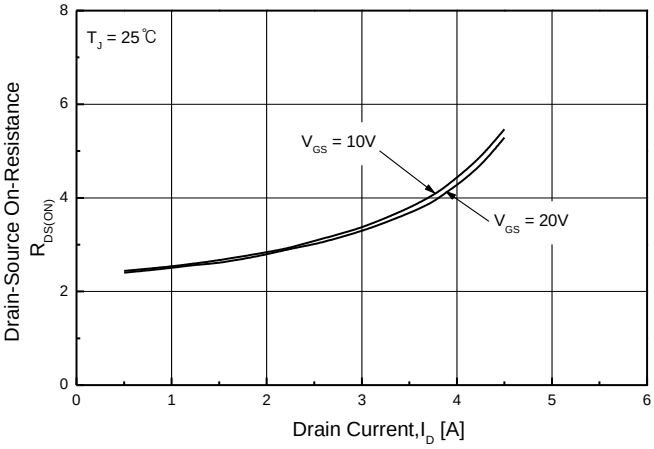
Parameter	Symbol	TMD3N40ZG/TMU3N40ZG	Unit
Maximum Thermal resistance, Junction-to-Case	R_{JC}	4.2	℃/W
Maximum Thermal resistance, Junction-to-Ambient	R_{JA}		

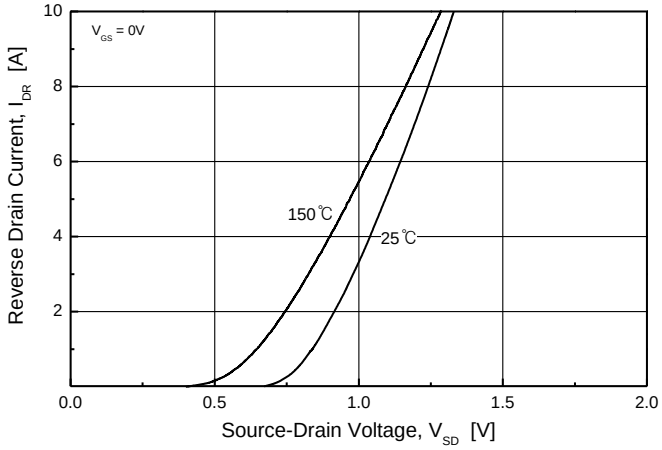
Electrical Characteristics : T_C=25℃, unless otherwise noted

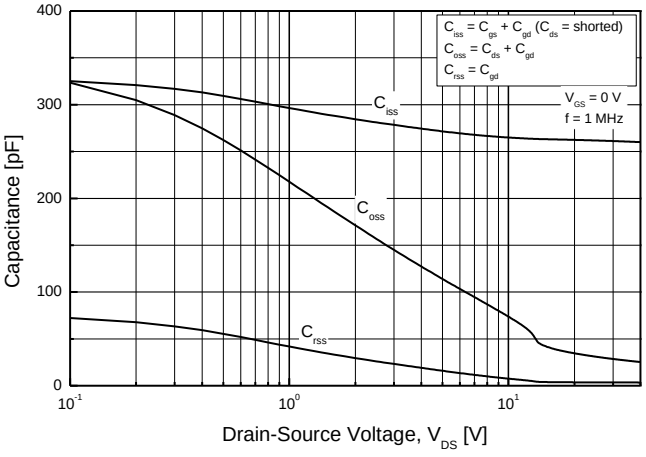
Note :
1. Repeated rating : Pulse width limited by safe operating area
2. L=10mH, I_{AS} =2A, V_{DD} = 50V, R_G = 25 , Starting T_J= 25 ℃
3 I_{SD} % µs , V_{DD} $_{DS}$, Starting T_J= 25 ℃
, µ %
5. Essentially Independent of Operating Temperature Typical Characteristics

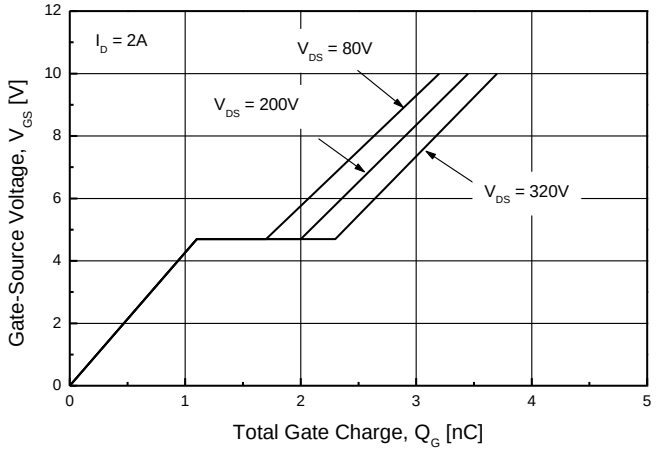

5
4
3
2
1
5
10
15
20

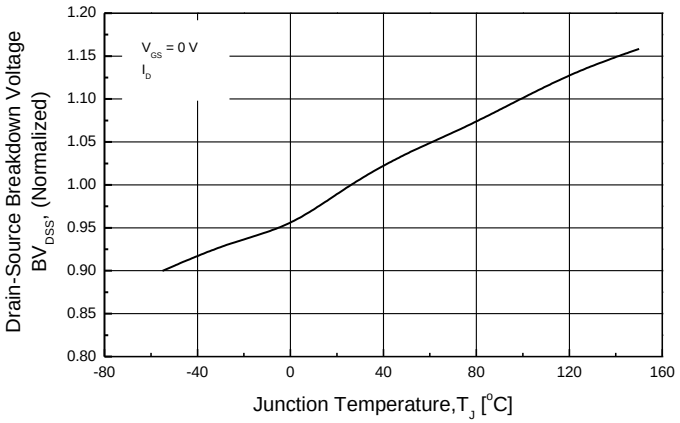

10
1
0.1
2
4
6
8

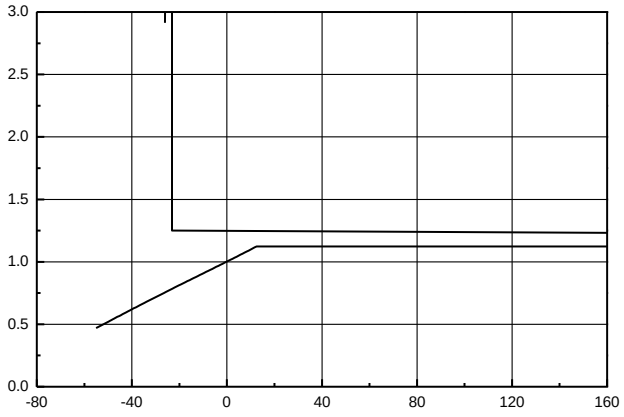

T_J = 25℃
V_GS = 10V
V_GS = 20V
Drain-Source On-Resistance
R_DS(ON)
Drain Current,I_D [A]
0
1
2
3
4
5
6
0
2
4
6
8

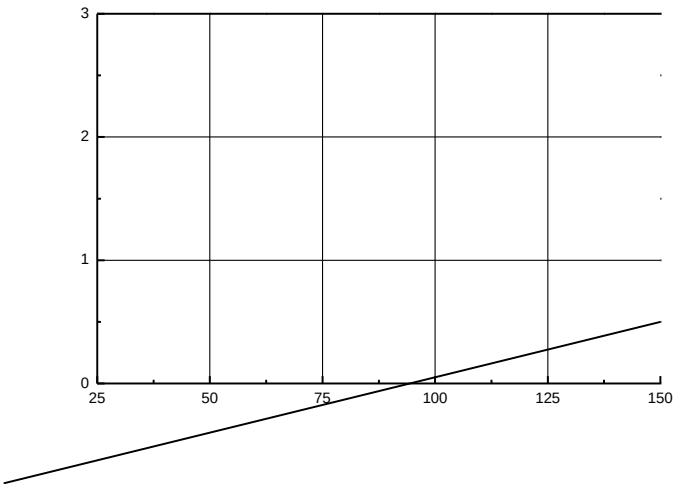

V_GS = 0V
150℃
25℃
Reverse Drain Current, I_DR [A]
Source-Drain Voltage, V_SD [V]
0.0
0.5
1.0
1.5
2.0
2
4
6
8
10

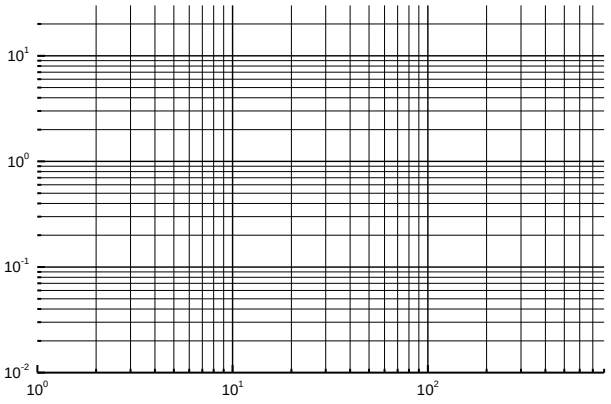

C_iss = C_gs + C_gd (C_ds = shorted)
C_oss = C_ds + C_gd
C_rss = C_gd
V_GS = 0 V
f = 1 MHz
C_iss
C_oss
C_rss
Capacitance [pF]
Drain-Source Voltage, V_DS [V]
0
100
200
300
400
10^-1
10^0
10^1

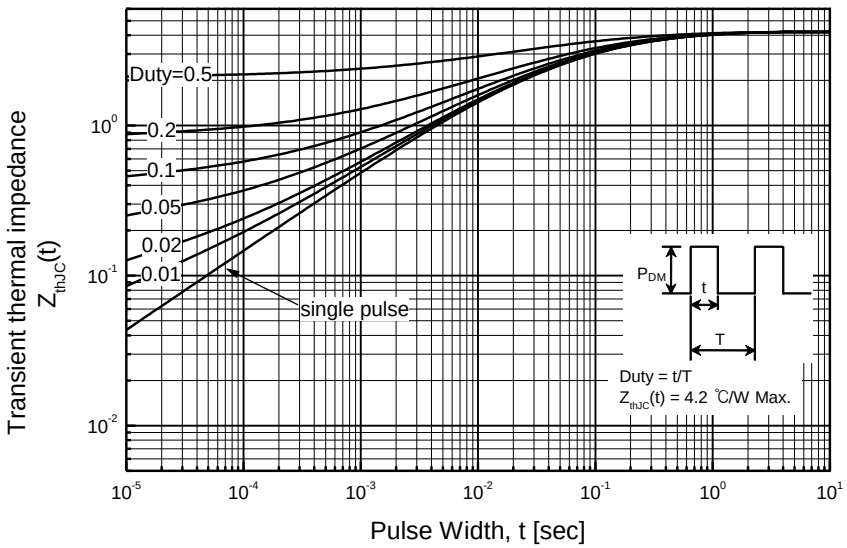

I_D = 2A
V_DS = 80V
V_DS = 200V
V_DS = 320V
Gate-Source Voltage, V_GS [V]
Total Gate Charge, Q_G [nC]
0
2
4
6
8
10
12
0
1
2
3
4
5


Drain-Source Breakdown Voltage
BV_DSS, (Normalized)
V_GS = 0 V
I_D
1.20
1.15
1.10
1.05
1.00
0.95
0.90
0.85
0.80
-80
-40
0
40
80
120
160
Junction Temperature,T_J [°C]

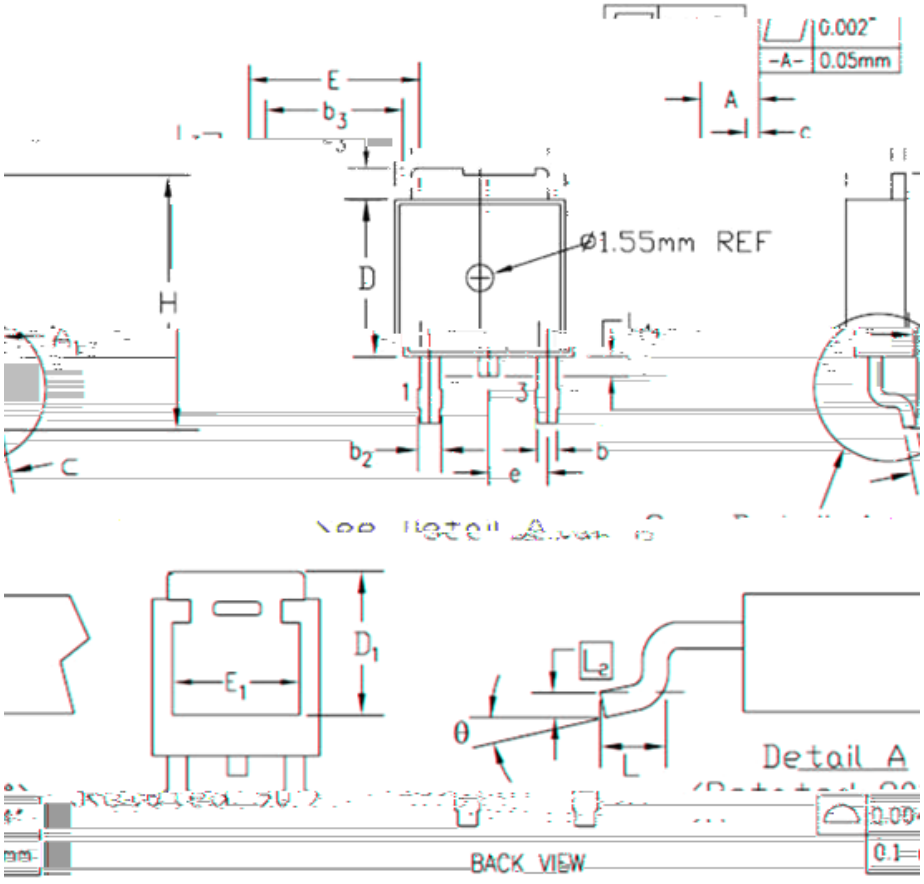

3.0
2.5
2.0
1.5
1.0
0.5
0.0
-80
-40
0
40
80
120
160


3
2
1
0
25
50
75
100
125
150


10^1
10^0
10^-1
10^-2
10^0
10^1
10^2

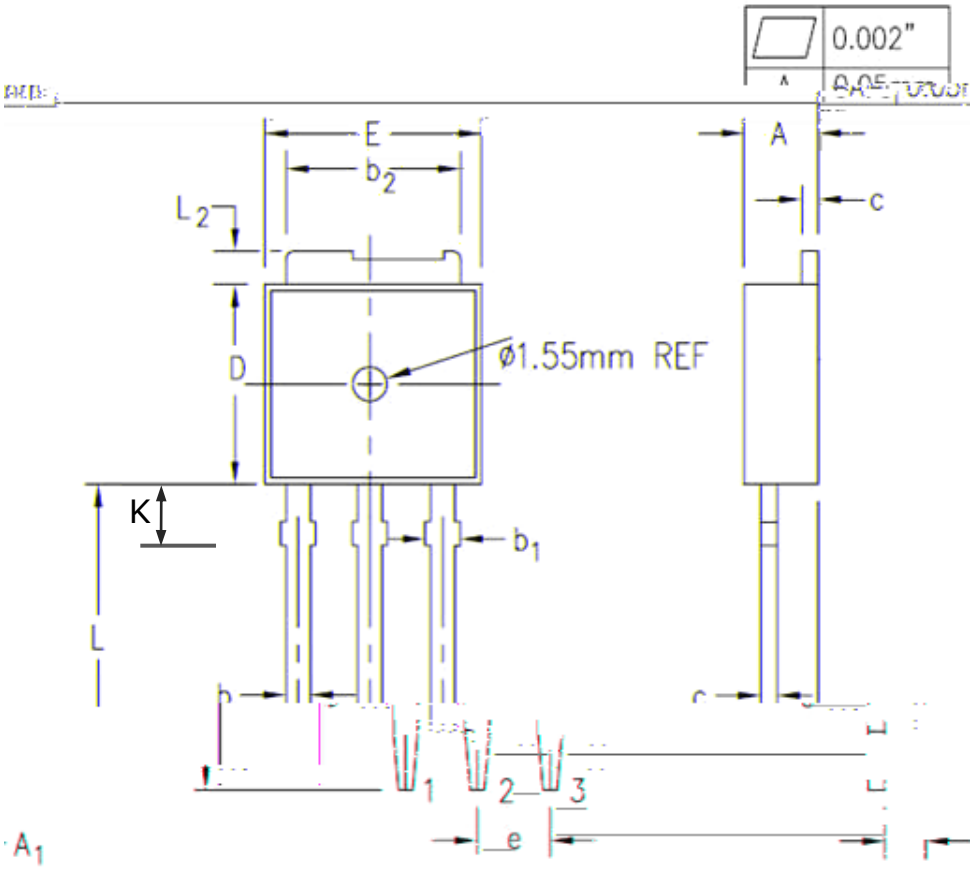

Transient thermal impedance
Z_thJC(t)
Duty=0.5
0.2
0.1
0.05
0.02
0.01
single pulse
P_DM
t
T
Duty = t/T
Z_thJC(t) = 4.2 ℃/W Max.
10^0
10^-1
10^-2
10^-5
10^-4
10^-3
10^-2
10^-1
10^0
10^1
Pulse Width, t [sec]

TO-252 (D-PAK) MECHANICAL DATA



SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN.	MAX.	MIN.	MAX.	
A	0.086	0.094	2.19	2.38	
A1	–	0.005	–	0.13	
b	0.025	0.035	0.64	0.89	
b2	0.033	0.045	0.84	1.14	
b3	0.205	0.215	5.21	5.46	
c	0.018	0.024	0.46	0.61	
E	0.235	0.245	5.97	6.22	
D1	0.205	–	5.21	–	2
D	0.250	0.265	6.35	6.73	
E1	0.190	–	4.83	–	2
e	0.090 BSC		2.29 BSC		
H	0.380	0.410	9.65	10.41	
L	0.055	0.070	1.40	1.78	4
L2	0.020 BSC		0.51 BSC		
L3	0.035	0.050	0.89	1.27	3
L4	0.025	0.040	0.64	1.02	1,3
θ	0°	6°	0°	6°	1,3

TO-251 (I-PAK) MECHANICAL DATA



	INCHES		MILIMETERS		NOTES
SYMBOL	MIN.	MAX.	MIN.	MAX.	
A	0.086	0.094	2.19	2.39	
A1	0.040	0.045	1.02	1.14	
b	0.025	0.035	0.64	0.89	
b1	0.037	0.045	0.95	1.14	
b2	0.205	0.215	5.21	5.46	
c	0.018	0.023	0.46	0.58	
D	0.235	0.245	5.97	6.22	
E	0.250	0.265	6.35	6.73	
e	0.090 TYP.		2.28 TYP.		
L	0.350	0.380	8.89	9.65	
L2	0.035	0.050	0.89	1.27	
K	0.079	0.096	2.00	2.44	