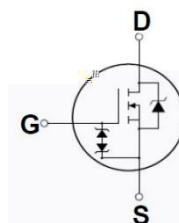
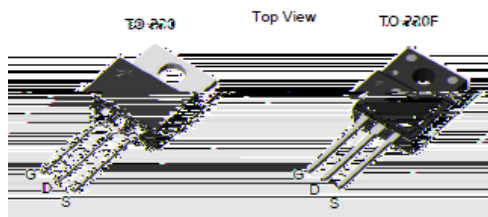


Features

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

N-channel MOSFET

BV_{DSS}	I_D	$R_{DS(on)}$
500V	2.5A	< 2.8Ω



Device	Package	Marking	Remark
TMP3N50Z / TMPF3N50Z	TO-220 / TO-220F	TMP3N50Z / TMPF3N50Z	RoHS
TMP3N50ZG / TMPF3N50ZG	TO-220 / TO-220F	TMP3N50ZG / TMPF3N50ZG	Halogen Free

Absolute Maximum Ratings

Parameter	Symbol	TMP3N50Z(G)	TMPF3N50Z(G)	Unit	
Drain-Source Voltage	V_{DSS}	500		V	
Gate-Source Voltage	V_{GS}	30		V	
Continuous Drain Current	I_D	$T_C = 25$	2.5	2.5 *	A
		$T_C = 100$	1.8	1.8 *	A
Pulsed Drain Current (Note 1)	I_{DM}	10	10 *	A	
Single Pulse Avalanche Energy (Note 2)	E_{AS}	107		mJ	
Repetitive Avalanche Current (Note 1)	I_{AR}	2.5		A	
Repetitive Avalanche Energy (Note 1)	E_{AR}	5.21		mJ	
Power Dissipation	P_D	$T_C = 25$	52.1	17.3	W
		Derate above 25	0.41	0.13	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,	T_L	300			

* Limited only by maximum junction temperature

Thermal Characteristics

Parameter	Symbol	TMP3N50Z(G)	TMPF3N50Z(G)	Unit
Maximum Thermal resistance, Junction-to-Case	$R_{\theta JC}$	2.4	7.2	/W
Maximum Thermal resistance, Junction-to-Ambient	$R_{\theta JA}$	62.5	62.5	/W

Electrical Characteristics : $T_C=25$, unless otherwise noted

Parameter	Symbol	Test condition	Min	Typ	Max	Units
OFF						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0\text{ V}, I_D = 250\ \mu\text{A}$	500	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 500\text{ V}, V_{GS} = 0\text{ V}$	--	--	1	μA
		$V_{DS} = 400\text{ V}, T_C = 125^\circ\text{C}$	--	--	10	μA
Forward Gate-Source Leakage Current	I_{GSSF}	$V_{GS} = 30\text{ V}, V_{DS} = 0\text{ V}$	--	--	100	μA
Reverse Gate-Source Leakage Current	I_{GSSR}	$V_{GS} = -30\text{ V}, V_{DS} = 0\text{ V}$	--	--	-100	μA

ON

Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\ \mu\text{A}$	2	--	4	V
Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS} = 10\text{ V}, I_D = 1.25\text{ A}$	--	2.3	2.8	Ω
Forward Transconductance ^(Note 4)	g_{FS}	$V_{DS} = 30\text{ V}, I_D = 1.25\text{ A}$	--	5	--	S

DYNAMIC

Input Capacitance	C_{iss}	$V_{DS} = 25\text{ V}, V_{GS} = 0\text{ V},$ $f = 1.0\text{ MHz}$	--	395	--	pF
Output Capacitance	C_{oss}		--	44	--	pF
Reverse Transfer Capacitance	C_{rss}		--	8	--	pF

SWITCHING

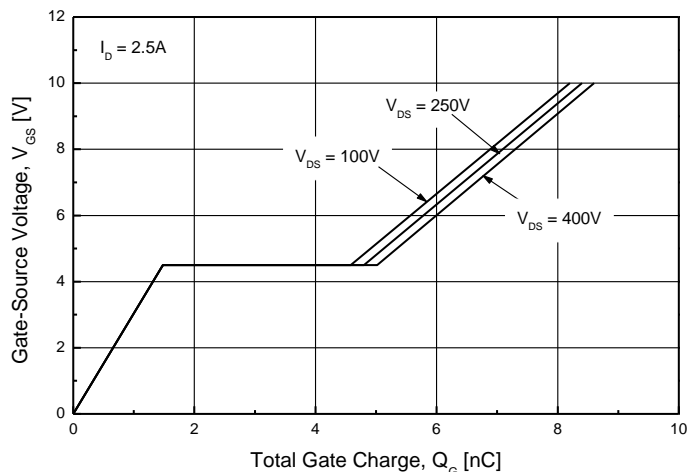
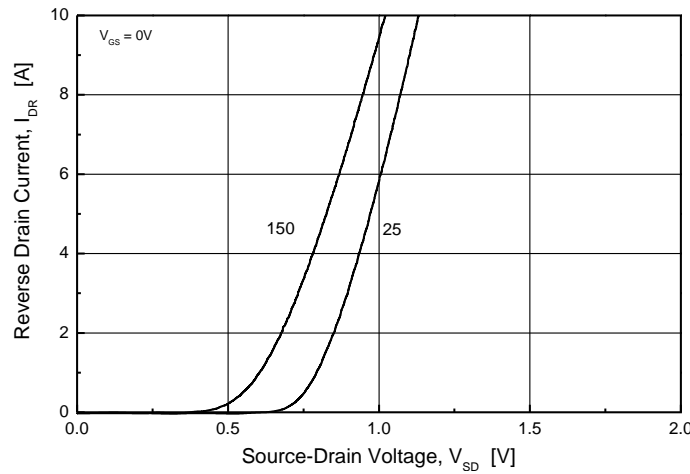
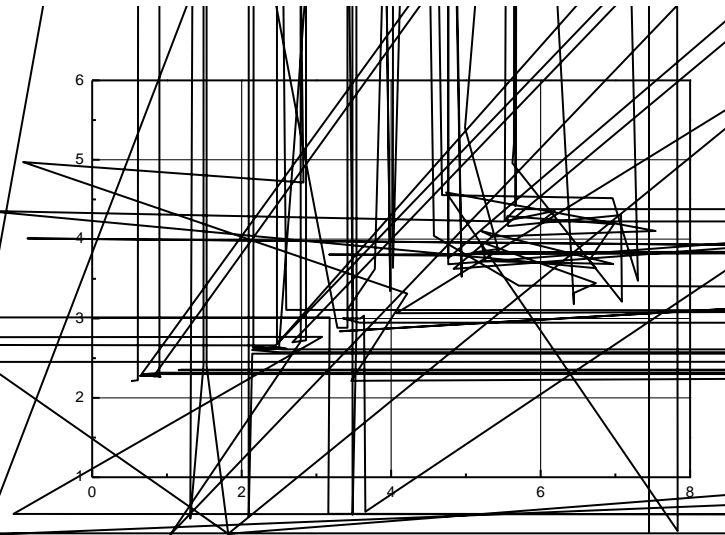
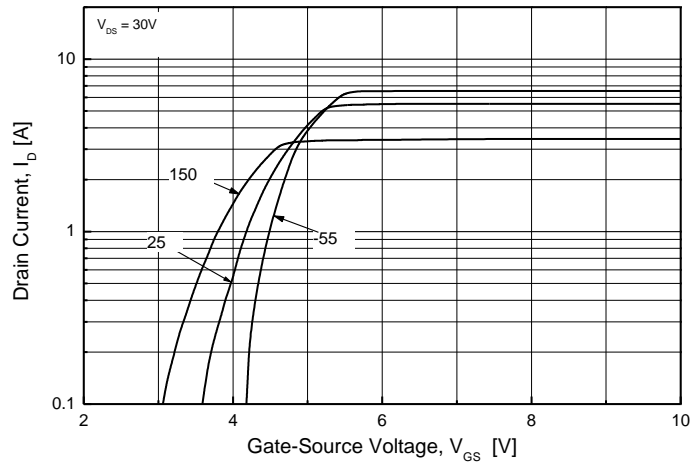
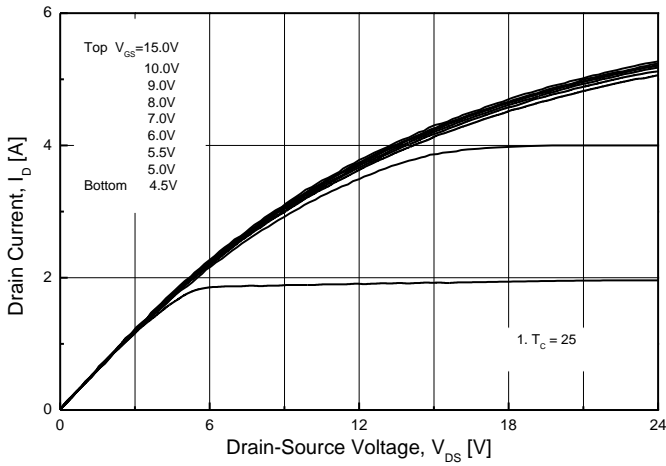
Turn-On Delay Time ^(Note 4,5)	$t_{d(on)}$	$V_{DD} = 300\text{ V}, I_D = 2.5\text{ A},$ $R_G = 25\ \Omega, V_{GS} = 10\text{ V}$	--	16	--	ns
Turn-On Rise Time ^(Note 4,5)	t_r		--	19	--	ns
Turn-Off Delay Time ^(Note 4,5)	$t_{d(off)}$		--	62	--	ns
Turn-Off Fall Time ^(Note 4,5)	t_f		--	18	--	ns
Total Gate Charge ^(Note 4,5)	Q_g	$V_{DS} = 400\text{ V}, I_D = 2.5\text{ A},$ $V_{GS} = 10\text{ V}$	--	9	--	nC
Gate-Source Charge ^(Note 4,5)	Q_{gs}		--	2	--	nC
Gate-Drain Charge ^(Note 4,5)	Q_{gd}		--	4	--	nC

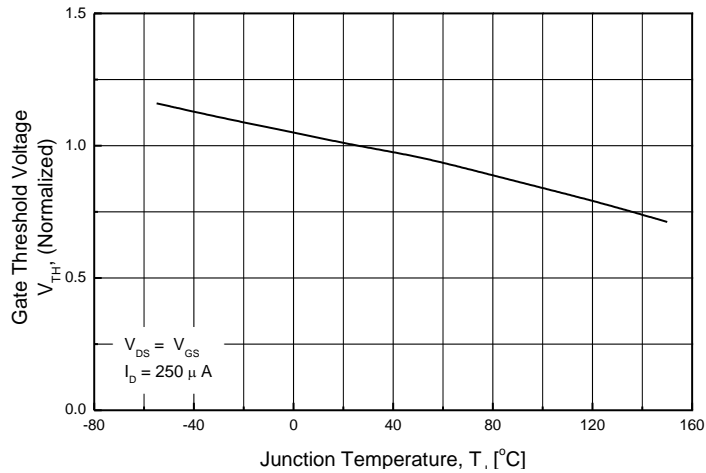
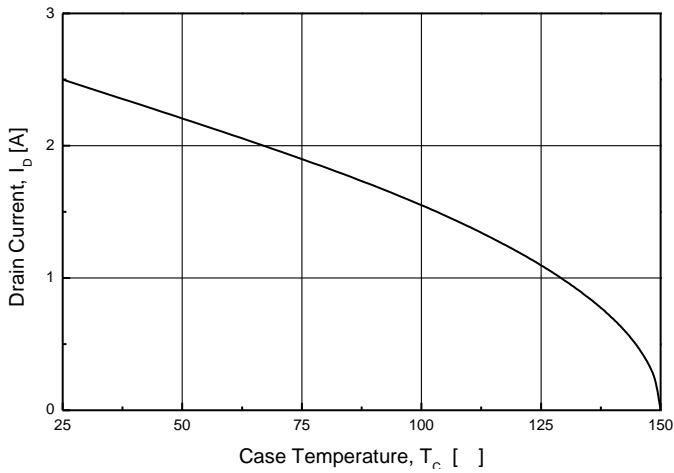
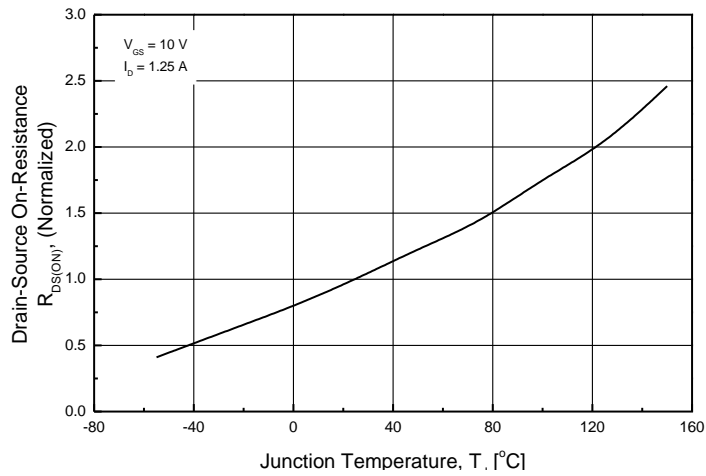
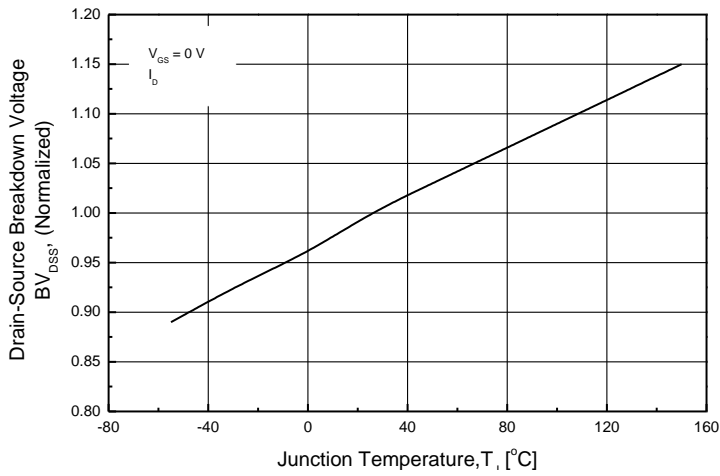
SOURCE DRAIN DIODE

Maximum Continuous Drain-Source Diode Forward Current	I_S	----	--	--	2.5	A
Maximum Pulsed Drain-Source Diode Forward Current	I_{SM}	----	--	--	10	A
Drain-Source Diode Forward Voltage	V_{SD}	$V_{GS} = 0\text{ V}, I_S = 2.5\text{ A}$	--	--	1.5	V
Reverse Recovery Time ^(Note 4)	t_{rr}	$V_{GS} = 0\text{ V}, I_S = 2.5\text{ A}$ $di_F / dt = 100\text{ A}/\mu\text{s}$	--	230	--	ns
Reverse Recovery Charge ^(Note 4)	Q_{rr}		--	0.9	--	μC

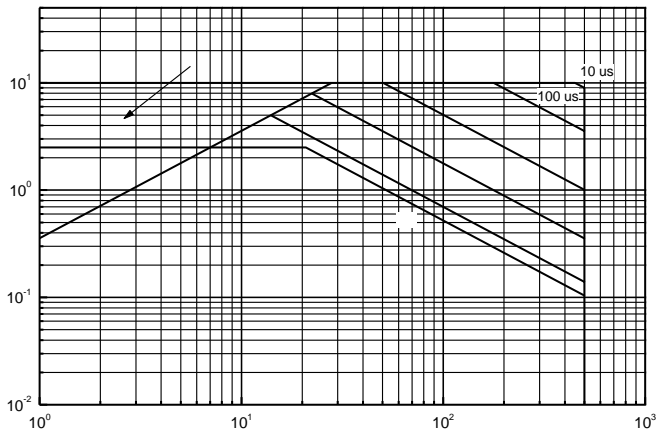
Note :

1. Repeated rating : Pulse width limited by safe operating area
2. $L=30.9\text{mH}, I_{AS} = 2.5\text{A}, V_{DD} = 50\text{V}, R_G = 25\ \Omega$, Starting $T_J= 25$
3. $I_{SD} = 2.5\text{A}, di/dt = 100\ \mu\text{A}/\mu\text{s}, V_{DD} = 50\text{V}, V_{DS} = 400\text{V}$, Starting $T_J= 25$
5. Essentially Independent of Operating Temperature Typical Characteristics

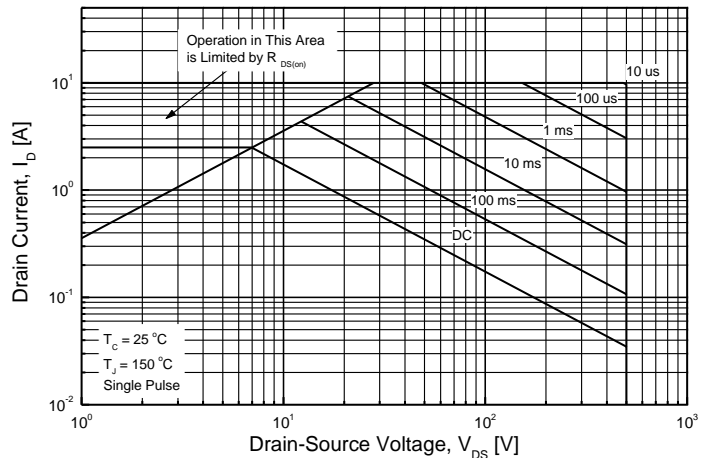


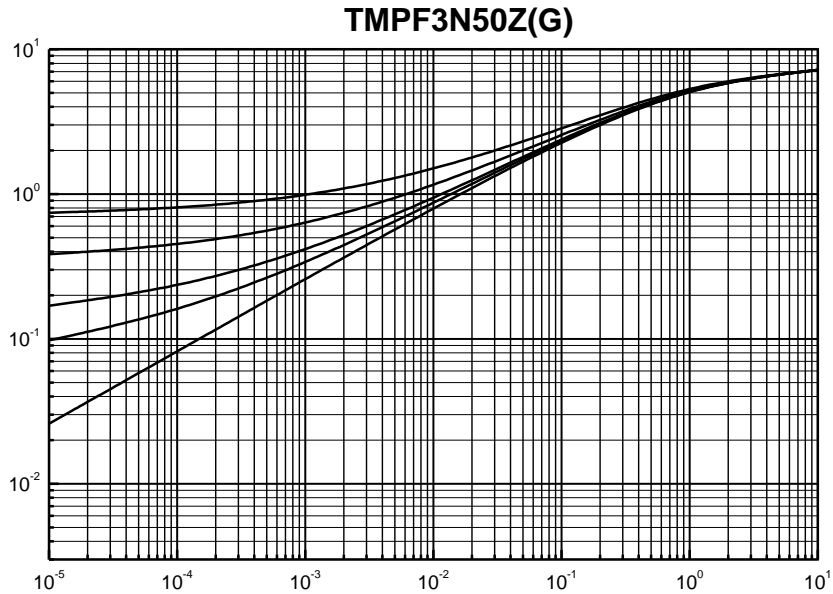
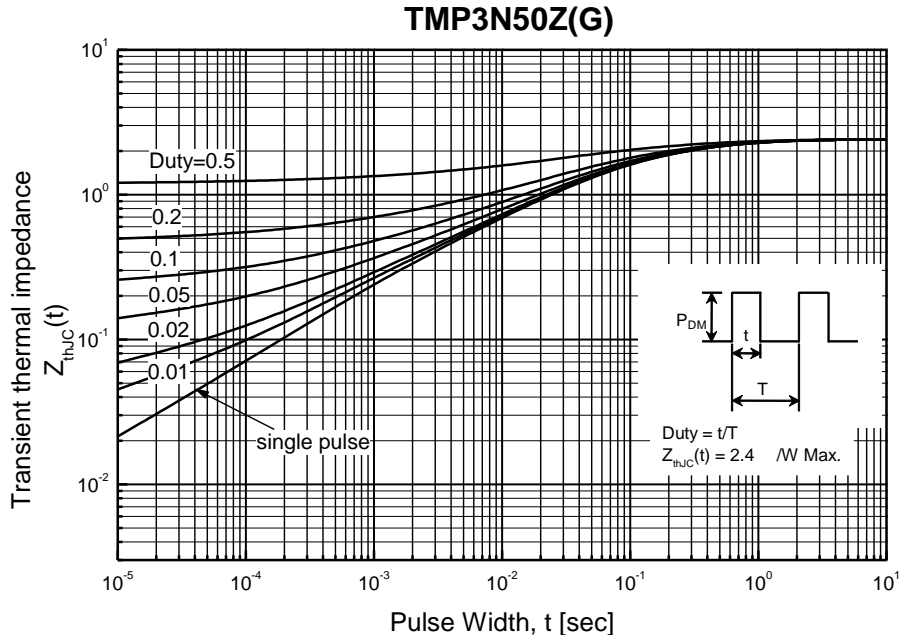


TMP3N50Z

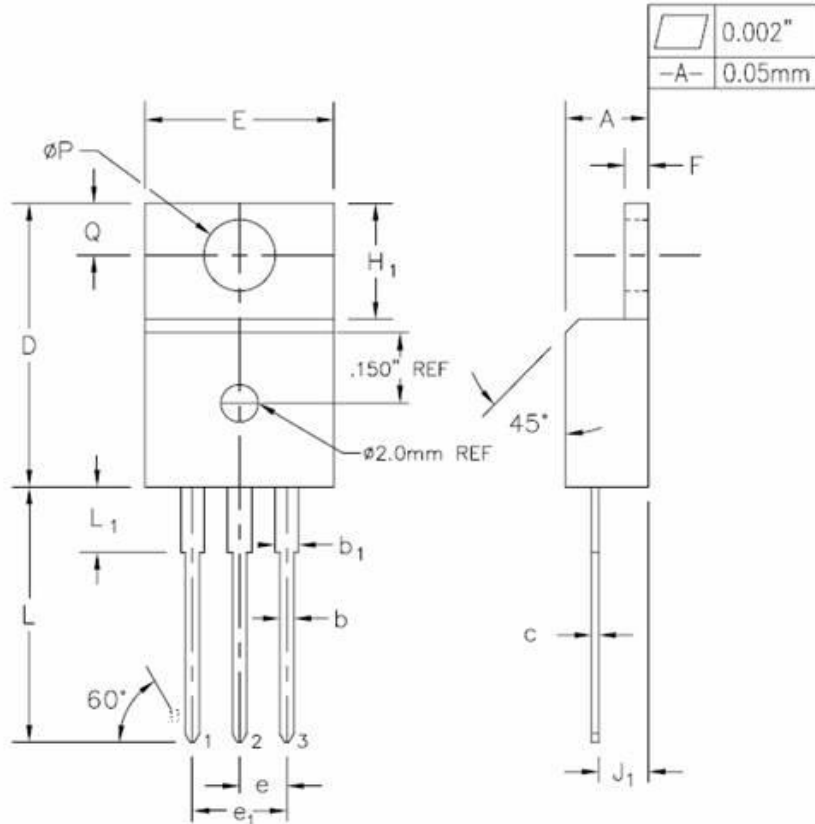


TMPF3N50Z





TO-220AB-3L MECHANICAL DATA



SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN.	MAX.	MIN.	MAX.	
A	0.170	0.180	4.32	4.57	
b	0.028	0.036	0.71	0.91	
b ₁	0.045	0.055	1.15	1.39	
c	0.014	0.021	0.36	0.53	
D	0.590	0.610	14.99	15.49	
E	0.395	0.410	10.04	10.41	
e	0.100 TYP.		2.54 TYP.		
e ₁	0.200 BSC		5.08 BSC		
F	0.048	0.054	1.22	1.37	
H ₁	0.235	0.255	5.97	6.47	
J ₁	0.100	0.110	2.54	2.79	
L	0.530	0.550	13.47	13.97	
L ₁	0.130	0.150	3.31	3.81	2
φP	0.149	0.173	3.78	3.98	
Q	0.102	0.112	2.60	2.84	

