



# TMP9N90/TMPF9N90 TMP9N90G/TMPF9N90G

## Features

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

$$V_{DSS} = 990 \text{ V @ } T_{jmax}$$

$$I_D = 9\text{A}$$

$$R_{DS(ON)} = 1.4 \Omega(\text{max}) @ V_{GS} = 10 \text{ V}$$

## Absolute Maximum Ratings

Parameter	Symbol	TMP9N90(G)	TMPF9N90(G)	Unit
Drain-Source Voltage	$V_{DSS}$	900		V
Gate-Source Voltage	$V_{GS}$	$\pm 30$		V
Continuous Drain Current	$T_C = 25 \text{ }^\circ\text{C}$	9	9 *	A
	$T_C = 100 \text{ }^\circ\text{C}$	5.7	5.7 *	A
Pulsed Drain Current (Note 1)	$I_{DM}$	36	36*	A
Single Pulse Avalanche Energy (Note 2)	$E_{AS}$	221		mJ
Repetitive Avalanche Current (Note 1)	$I_{AR}$	9		A
Repetitive Avalanche Energy (Note 1)	$E_{AR}$	29		mJ
Power Dissipation	$T_C = 25 \text{ }^\circ\text{C}$	290	48	W
	Derate above 25 °C	2.32	0.38	W/°C
Peak Diode Recovery dv				



## 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	$BV_{DSS}$	$V_{GS} = 0\text{ V}, I_D = 250\ \mu\text{A}$	900	--	--	V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS} = 900\text{ V}, V_{GS} = 0\text{ V}$	--	--	10	$\mu\text{A}$
		$V_{DS} = 720\text{ V}, T_C = 125^\circ\text{C}$	--	--	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	$R_{DS(on)}$	$V_{GS} = 10\text{ V}, I_D = 4.5\text{ A}$	--	1.13	1.4	$\Omega$
Forward Transconductance <sup>(Note 4)</sup>	$g_{FS}$	$V_{DS} = 30\text{ V}, I_D = 4.5\text{ A}$	--	10	--	S

### DYNAMIC

Input Capacitance	$C_{iss}$	$V_{DS} = 25\text{ V}, V_{GS} = 0\text{ V},$ $f = 1.0\text{ MHz}$	--	2324	--	pF
Output Capacitance	$C_{oss}$		--	184	--	pF
Reverse Transfer Capacitance	$C_{rss}$		--	29	--	pF

### SWITCHING

Turn-On Delay Time <sup>(Note 4,5)</sup>	$t_{d(on)}$	$V_{DD} = 450\text{ V}, I_D = 9\text{ A},$ $R_G = 25$	--	61	--	ns
Turn-On Rise Time <sup>(Note 4,5)</sup>	$t_r$		--	49	--	ns
Turn-Off Delay Time <sup>(Note 4,5)</sup>	$t_{d(off)}$		--	318	--	ns
Turn-Off Fall Time <sup>(Note 4,5)</sup>						

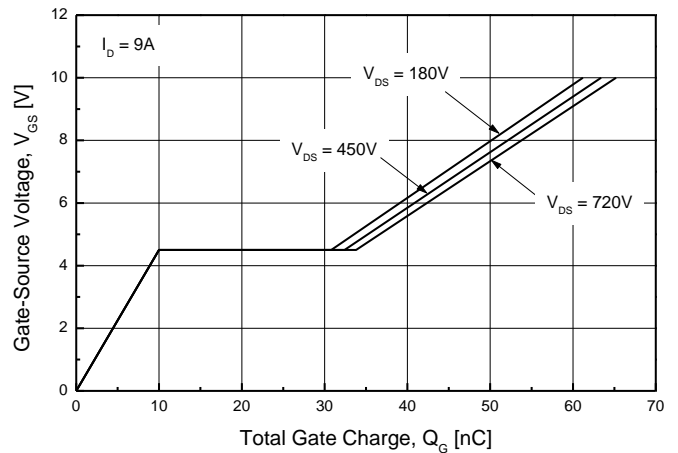
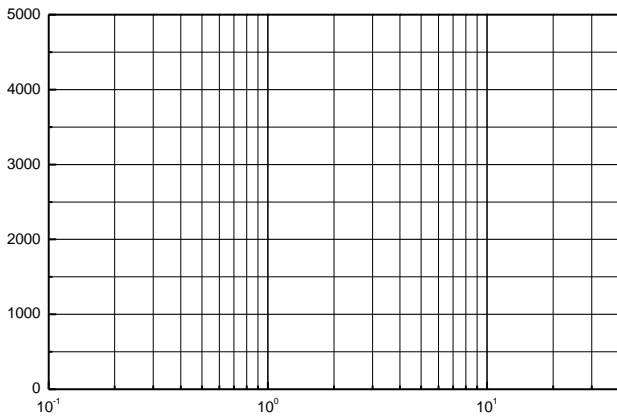
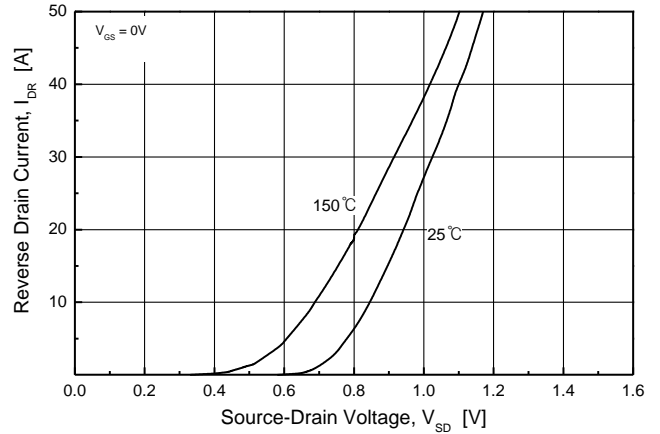
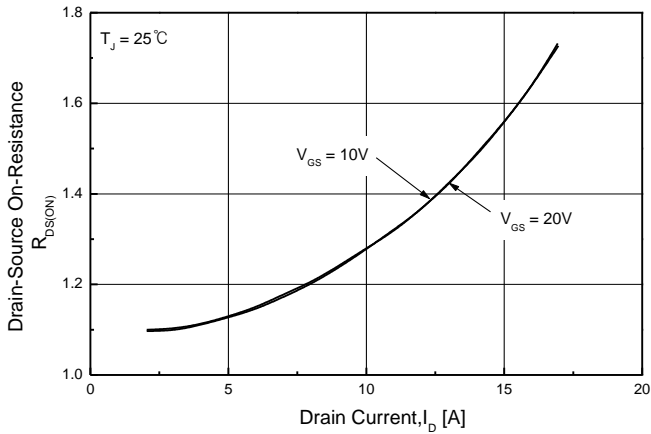
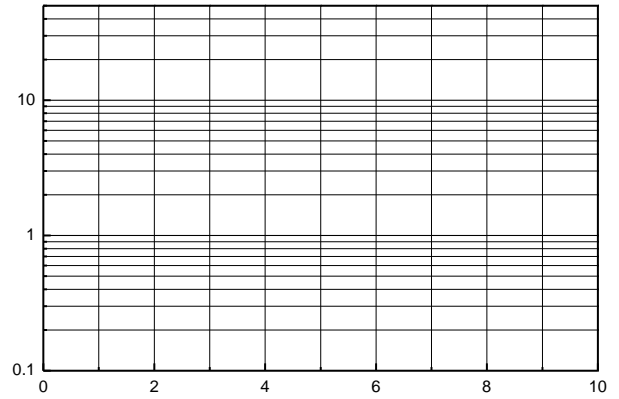
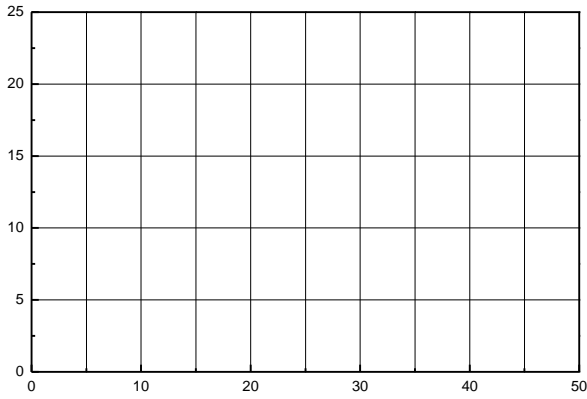
Note :

1. Repeated rating : Pulse width limited by safe operating area
2.  $L=5.16\text{mH}, I_{AS} = 9\text{A}, V_{DD} = 50\text{V}, R_G = 25\ \mu\text{s}$ , Starting  $T_J = 25^\circ\text{C}$
3.  $I_{SD}, di/dt, \mu\text{s}, V_{DD}, V_{DS}$ , Starting  $T_J = 25^\circ\text{C}$

5. Essentially Independent of Operating Temperature Typical Characteristics

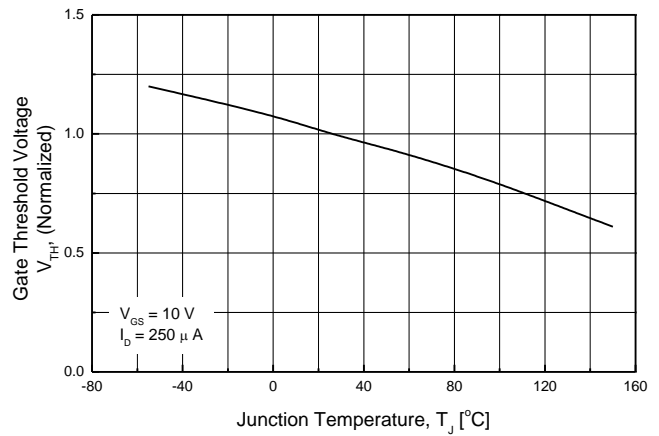
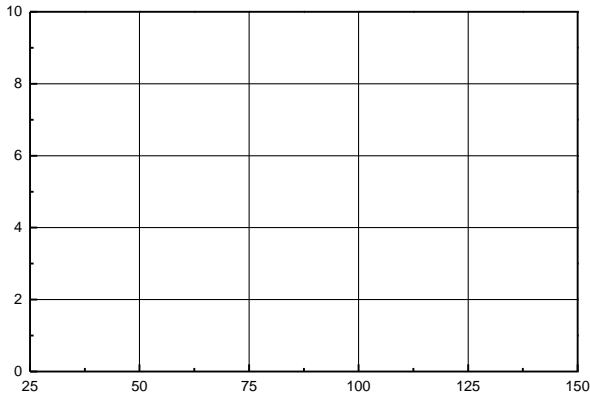
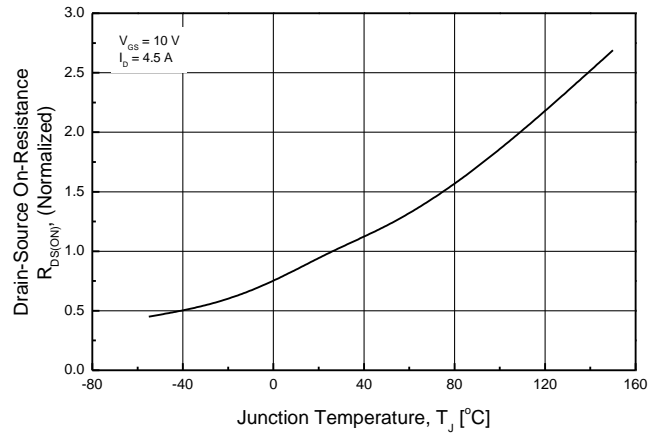
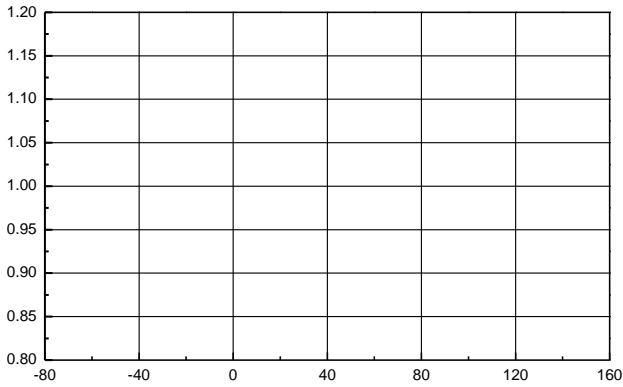


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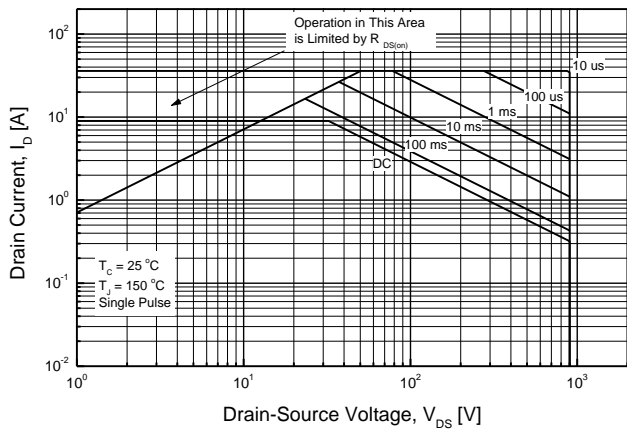




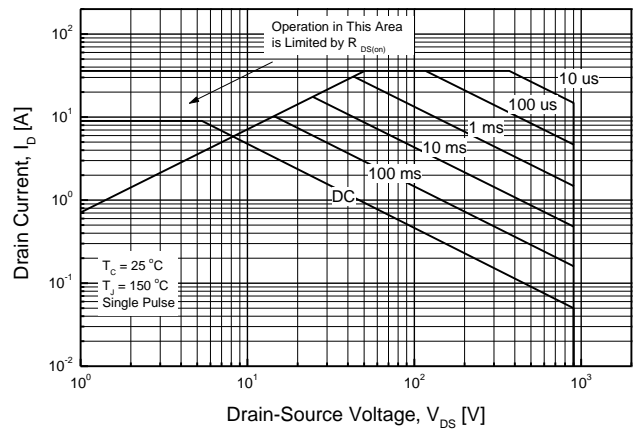
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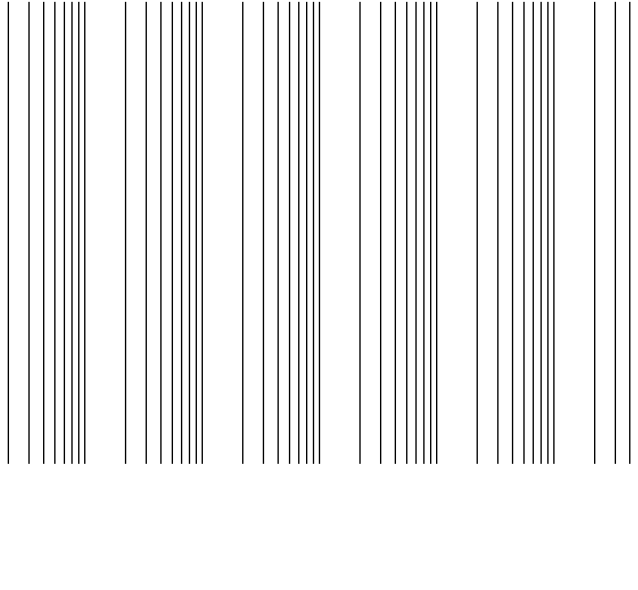
**TMP9N90(G)**



**TMPF9N90(G)**



**TMP9N90(G)**



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