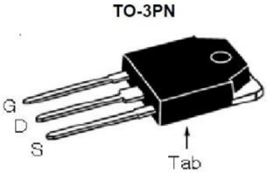
TMAN11N90Z

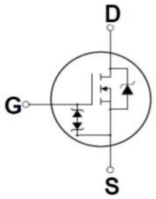
N-channel MOSFET

BV_{DSS}	I_D	$R_{DS(on)MAX}$
900V	11A	<0.95Ω

Features

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





Device	Package	Marking	Remark
TMAN11N90Z	TO-3PN	TMAN11N90Z	RoHS

Absolute Maximum Ratings

Parameter		Symbol	TMAN11N90Z	Unit
Drain-Source Voltage		V_{DS}	900	V
Gate-Source Voltage		V_{GS}	30	V
Continuous Drain Current	T_C = 25	I_D	11	A
	T_C = 100		8.5	A
Pulsed Drain Current (Note 1)		I_{DM}	44	A
Single Pulse Avalanche Energy (Note 2)		E_{AS}	360	mJ
Repetitive Avalanche Current (Note 1)		I_{AR}	11	A
Repetitive Avalanche Energy (Note 1)		E_{AR}	41.6	mJ
Power Dissipation	T_C = 25	P_D	416	W
	Derate above 25		3.3	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	TMAN11N90Z	Unit
Maximum Thermal resistance, Junction-to-Case	$R_{\theta JC}$	0.3	/W
Maximum Thermal resistance, Junction-to-Ambient	$R_{\theta JA}$	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 V, I_D = 250 μA	900	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 900 V, V_{GS} = 0 V	--	--	1	μA
		V_{DS} = 720 V, T_C = 125°C	--	--	10	μA
Forward Gate-Source Leakage Current	I_{GSSF}	V_{GS} = 30 V, V_{DS} = 0 V	--	--	100	μA
Reverse Gate-Source Leakage Current	I_{GSSR}	V_{GS} = -30 V, V_{DS} = 0 V	--	--	-100	μA
ON						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250 μA	2	--	4	V
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS} = 10 V, I_D = 5.5 A	--	0.75	0.95	Ω
Forward Transconductance (Note 4)	g_{FS}	V_{DS} = 30 V, I_D = 5.5 A	--	8	--	S
DYNAMIC						
Input Capacitance	C_{iss}	V_{DS} = 25 V, V_{GS} = 0 V, f = 1.0 MHz	--	3737	--	pF
Output Capacitance	C_{oss}		--	267	--	pF
Reverse Transfer Capacitance	C_{rss}		--	32	--	pF
SWITCHING						
Turn-On Delay Time (Note 4,5)	$t_{d(on)}$	V_{DD} = 450 V, I_D = 11 A, R_G = 25	--	59	--	ns
Turn-On Rise Time (Note 4,5)	t_r		--	62	--	ns
Turn-Off Delay Time (Note 4,5)	$t_{d(off)}$		--	408	--	ns
Turn-Off Fall Time (Note 4,5)	t_f		--	83	--	ns
Total Gate Charge (Note 4,5)	Q_g	V_{DS} = 720V, I_D = 11 A, V_{GS} = 10 V	--	95	--	nC
Gate-Source Charge (Note 4,5)	Q_{gs}		--	13	--	nC
Gate-Drain Charge (Note 4,5)	Q_{gd}		--	40	--	nC
SOURCE DRAIN DIODE						
Maximum Continuous Drain-Source Diode Forward Current	I_S	---	--	--	11	A
Maximum Pulsed Drain-Source Diode Forward Current	I_{SM}	---	--	--	44	A
Drain-Source Diode Forward Voltage	V_{SD}	V_{GS} = 0 V, I_S = 11 A	--	--	1.5	V
Reverse Recovery Time (Note 4)	t_{rr}	V_{GS} = 0 V, I_S = 11 A dI_F / dt = 100 A/μs	--	513	--	ns
Reverse Recovery Charge (Note 4)	Q_{rr}		--	6	--	μC

Note :

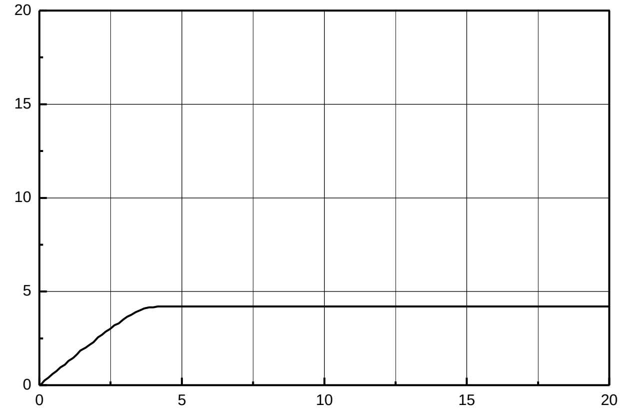
1. Repeated rating : Pulse width limited by safe operating area

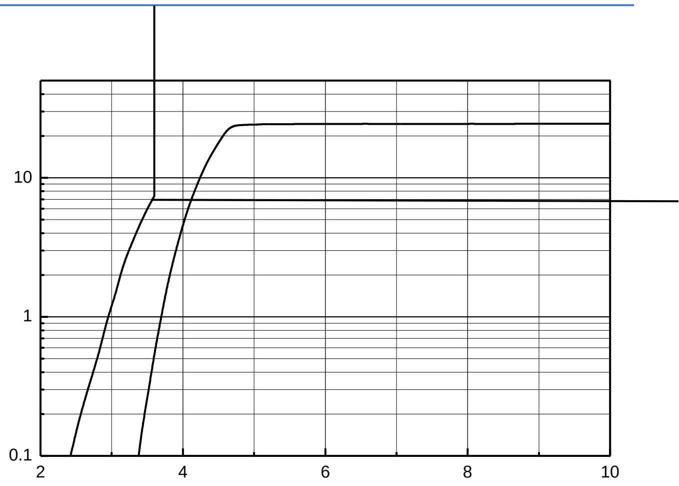
2. L=5.6mH, I_{AS} = 11A, V_{DD} = 50V, R_G = 25 , Starting T_J= 25

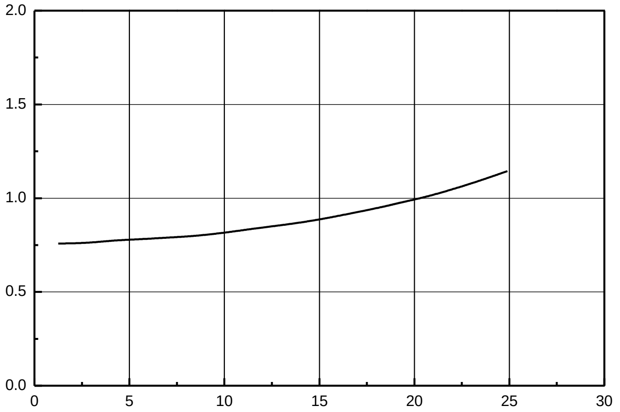
3 I_{SD} 11A, di/dt μs , V_{DD} $_{DS}$, Starting T_J= 25

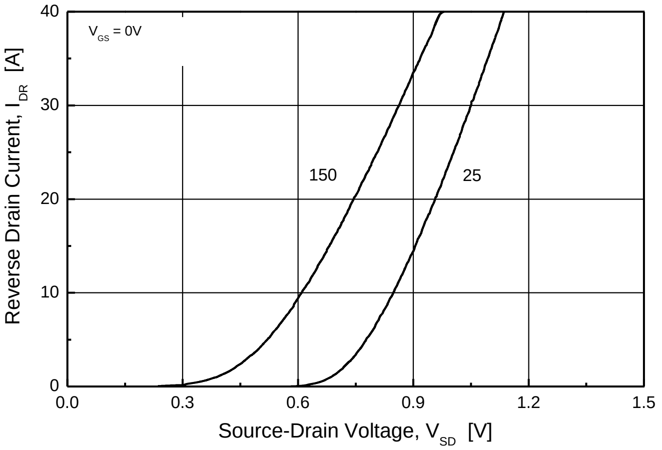
μ

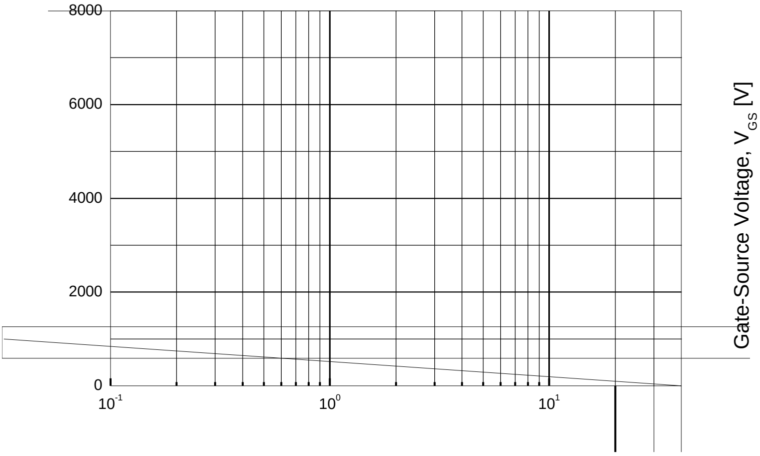
5. Essentially Independent of Operating Temperature Typical Characteristics

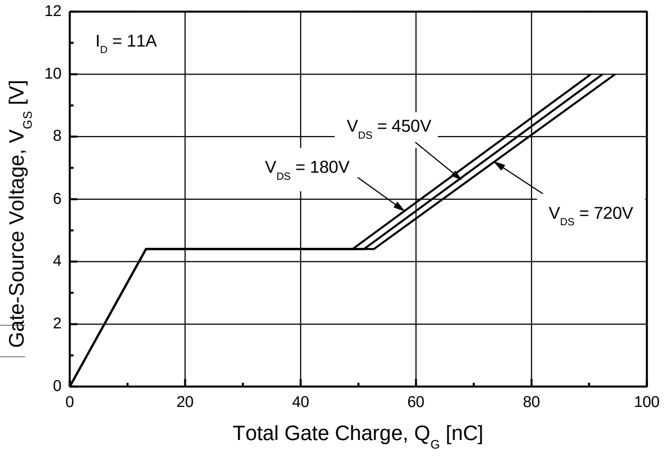

20
15
10
5
0
0
5
10
15
20


10
1
0.1
2
4
6
8
10


2.0
1.5
1.0
0.5
0.0
0
5
10
15
20
25
30


V_{GS} = 0V
Reverse Drain Current, I_{DR} [A]
40
30
20
10
0
150
25
0.0
0.3
0.6
0.9
1.2
1.5
Source-Drain Voltage, V_{SD} [V]


8000
6000
4000
2000
0
10^{-1}
10^{0}
10^{1}


I_D = 11A
Gate-Source Voltage, V_{GS} [V]
12
10
8
6
4
2
0
V_{DS} = 450V
V_{DS} = 180V
V_{DS} = 720V
0
20
40
60
80
100
Total Gate Charge, Q_G [nC]

TO-3PN MECHANICAL DATA