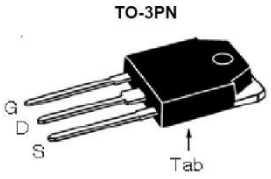
TMAN12N80Z

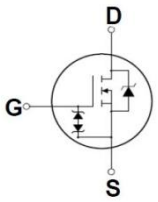
N-channel MOSFET

BV_{DSS}	I_D	$R_{DS(on)MAX}$
800V	12A	<0.65Ω

Features

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





Device	Package	Marking	Remark
TMAN12N80Z	TO-3PN	TMAN12N80Z	RoHS

Absolute Maximum Ratings

Parameter		Symbol	TMAN12N80Z	Unit
Drain-Source Voltage		V_{DS}	800	V
Gate-Source Voltage		V_{GS}	30	V
Continuous Drain Current	T_C = 25	I_D	12	A
	T_C = 100		8.95	A
Pulsed Drain Current (Note 1)		I_{DM}	48	A
Single Pulse Avalanche Energy (Note 2)		E_{AS}	330	mJ
Repetitive Avalanche Current (Note 1)		I_{AR}	12	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

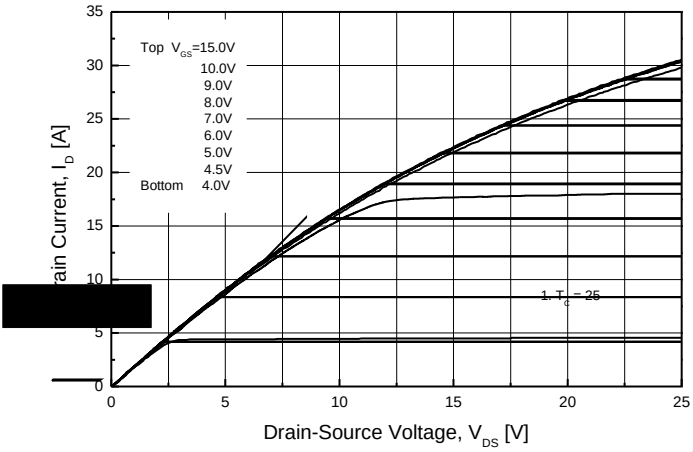
Thermal Characteristics

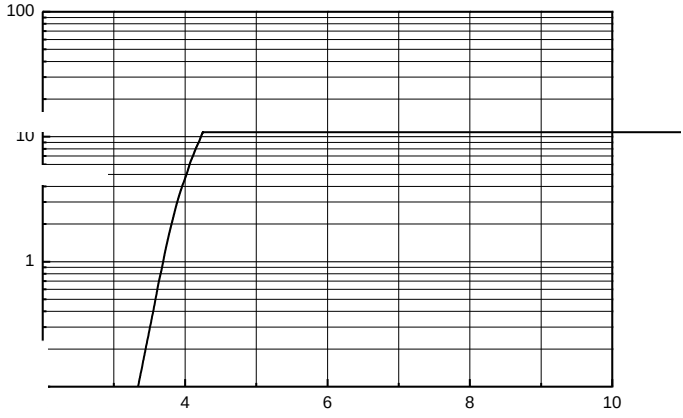
Parameter	Symbol	TMAN12N80Z	Unit
Maximum Thermal resistance, Junction-to-Case	$R_{\theta JC}$	0.3	/W
Maximum Thermal resistance, Junction-to-Ambient	$R_{\theta JA}$	62.5	/W

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	800	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 800 V, V_{GS} = 0 V	--	--	1	µA
		V_{DS} = 640 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 = 6 A	--	0.53	0.65	Ω
Forward Transconductance (Note 4)	g_{FS}	V_{DS} = 30 V, I_D = 6 A	--	8	--	S
DYNAMIC						
Input Capacitance	C_{iss}	V_{DS} = 25 V, V_{GS} = 0 V, f = 1.0 MHz	--	3723	--	pF
Output Capacitance	C_{oss}		--	295	--	pF
Reverse Transfer Capacitance	C_{rss}		--	32	--	pF
SWITCHING						
Turn-On Delay Time (Note 4,5)	$t_{d(on)}$	V_{DD} = 400 V, I_D = 12 A, R_G = 25	--	59	--	ns
Turn-On Rise Time (Note 4,5)	t_r		--	64	--	ns
Turn-Off Delay Time (Note 4,5)	$t_{d(off)}$		--	410	--	ns
Turn-Off Fall Time (Note 4,5)	t_f		--	94	--	ns
Total Gate Charge (Note 4,5)	Q_g	V_{DS} = 640V, I_D = 12 A, V_{GS} = 10 V	--	94	--	nC
Gate-Source Charge (Note 4,5)	Q_{gs}		--	13	--	nC
Gate-Drain Charge (Note 4,5)	Q_{gd}		--	39	--	nC
SOURCE DRAIN DIODE						
Maximum Continuous Drain-Source Diode Forward Current	I_S	---	--	--	12	A
Maximum Pulsed Drain-Source Diode Forward Current	I_{SM}	---	--	--	48	A
Drain-Source Diode Forward Voltage	V_{SD}	V_{GS} = 0 V, I_S = 12 A	--	--	1.5	V
Reverse Recovery Time (Note 4)	t_{rr}	V_{GS} = 0 V, I_S = 12 A	--	369	--	ns
Reverse Recovery Charge (Note 4)	Q_{rr}	dI_F / dt = 100 A/µs	--	3.4	--	µC

Note :
1. Repeated rating : Pulse width limited by safe operating area
2. L=4.3mH, I_{AS} = 12A, V_{DD} = 50V, R_G = 25 , Starting T_J= 25
3 I_{SD} 12A, di/dt µs , V_{DD} $_{DS}$, Starting T_J= 25
µ
5. Essentially Independent of Operating Temperature Typical Characteristics





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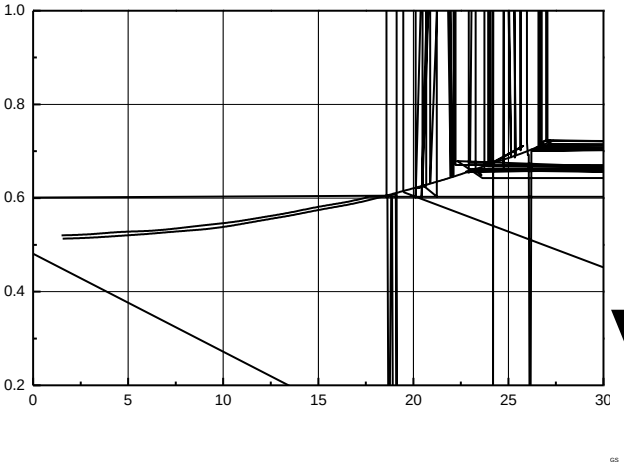

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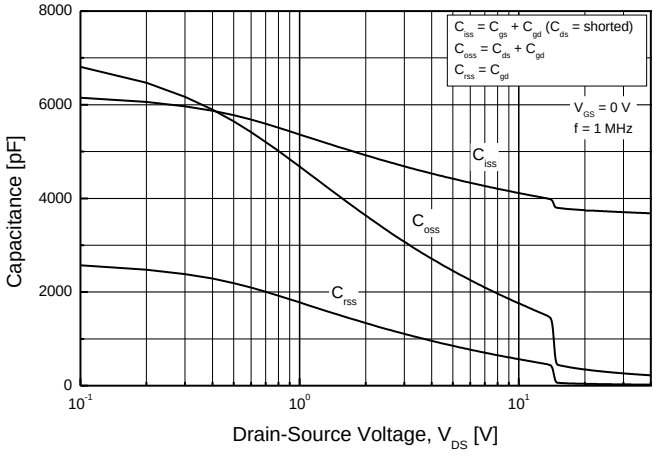
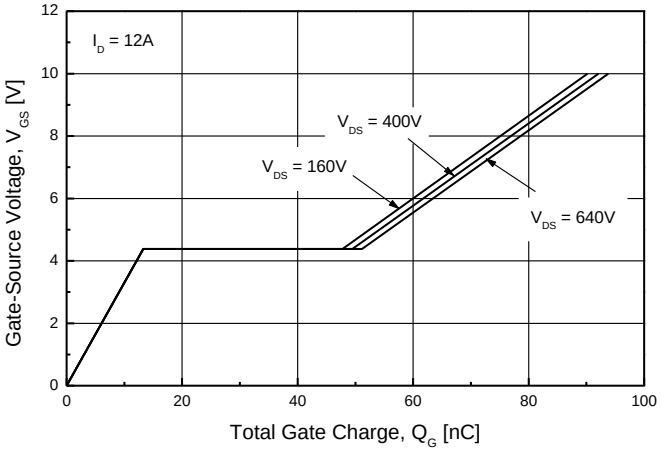
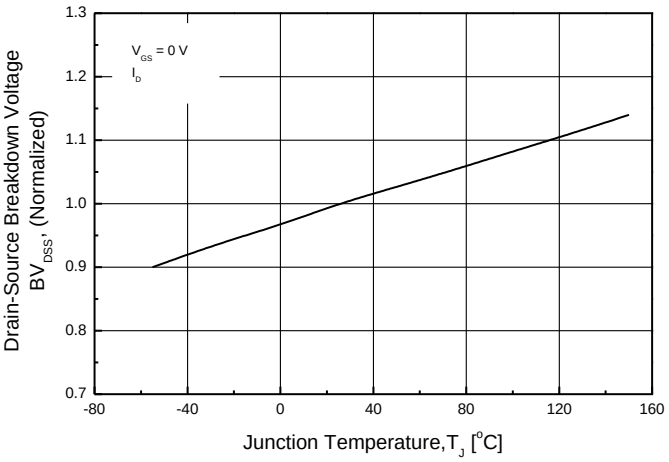
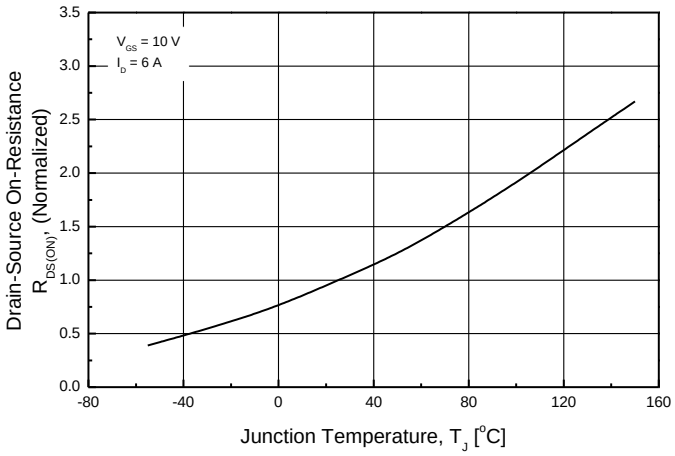
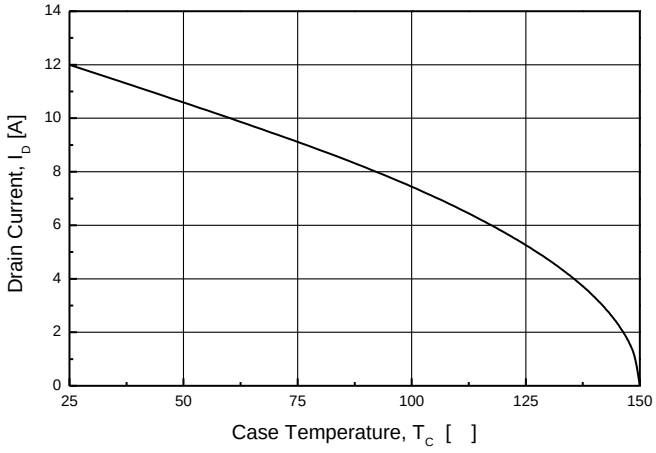
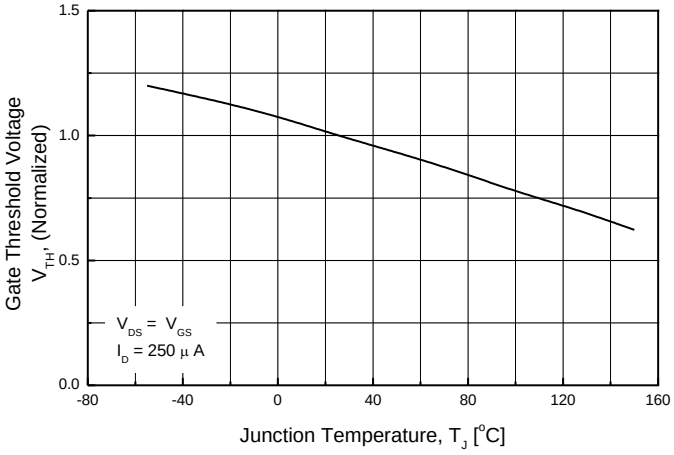


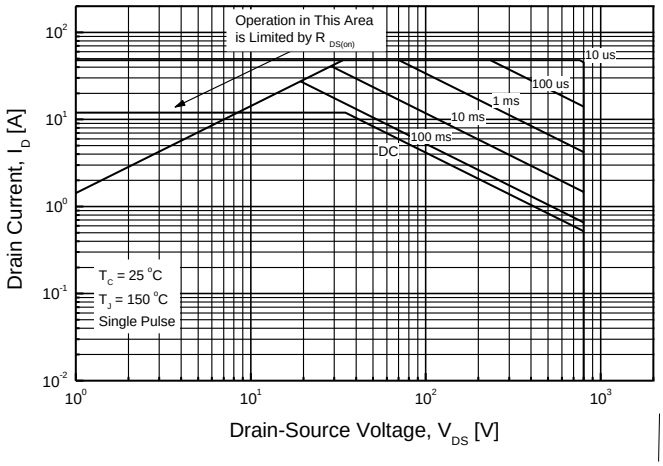


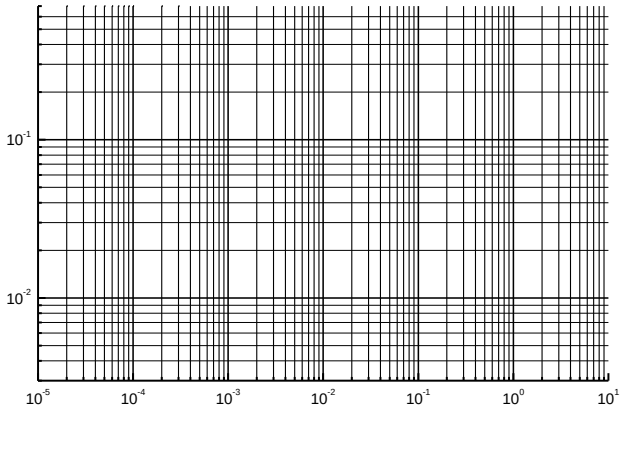

V_{GS} = 0 V
I_D
Drain-Source Breakdown Voltage
BV_{DSS}, (Normalized)
Junction Temperature,T_J [°C]


V_{GS} = 10 V
I_D = 6 A
Drain-Source On-Resistance
$R_{DS(ON)}$, (Normalized)
Junction Temperature, T_J [°C]

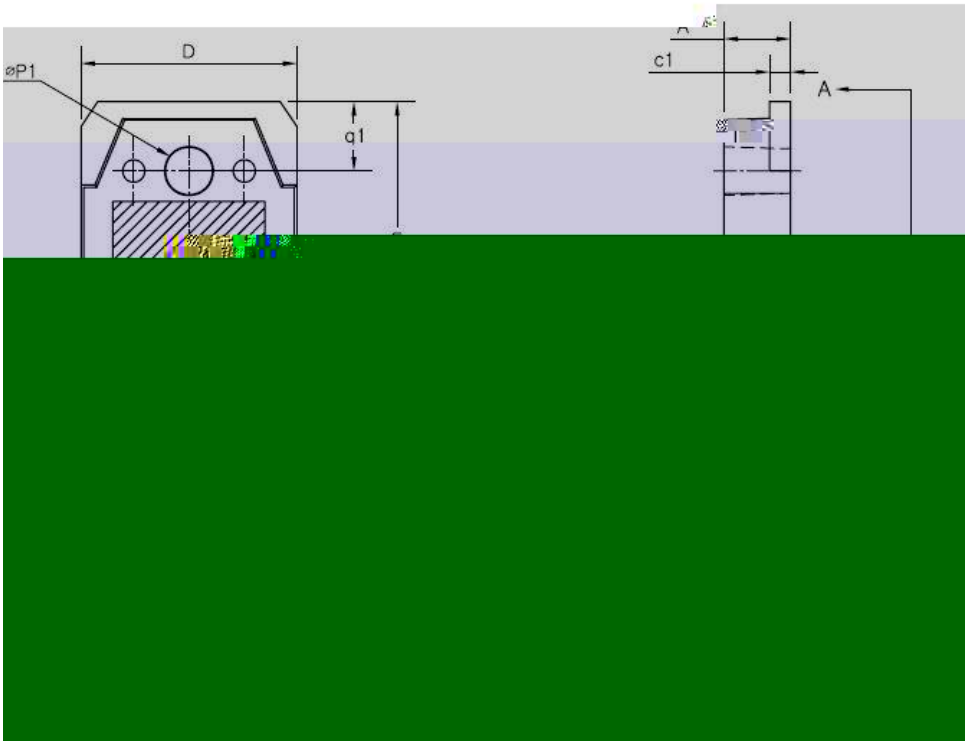

Drain Current, I_D [A]
Case Temperature, T_C [ ]

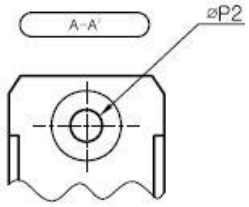

V_{DS} = V_{GS}
I_D = 250 μ A
Gate Threshold Voltage
V_{TH}, (Normalized)
Junction Temperature, T_J [°C]


Operation in This Area
is Limited by $R_{DS(on)}$
10 us
100 us
1 ms
10 ms
100 ms
DC
T_C = 25 °C
T_J = 150 °C
Single Pulse
Drain Current, I_D [A]
Drain-Source Voltage, V_{DS} [V]



TO-3PN MECHANICAL DATA





SYMBOL	MIN	NOM	MAX
A	4.60	4.80	5.00
øP1	3.30	3.40	3.50
Q	2.20	2.40	2.60
q1	4.80	5.00	5.20