

TMP10N80/TMPF10N80

TMP10N80G/TMPF10N80G

Features

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

$$V_{DSS} = 880 \text{ V @ } T_{jmax}$$

$$I_D = 9.5 \text{ A}$$

$$R_{DS(ON)} = 1.05 \Omega(\text{max}) @ V_{GS} = 10 \text{ V}$$

Absolute Maximum Ratings

Parameter	Symbol	TMP10N80(G)	TMPF10N80(G)	Unit	
Drain-Source Voltage	V_{DSS}	800		V	
Gate-Source Voltage	V_{GS}	30		V	
Continuous Drain Current	I_D	$T_C = 25$	9.5	9.5 *	A
		$T_C = 100$	6.4	6.4 *	A
Pulsed Drain Current (Note 1)	I_{DM}	38	38*	A	
Single Pulse Avalanche Energy (Note 2)	E_{AS}	231		mJ	
Repetitive Avalanche Current (Note 1)	I_{AR}	9.5		A	
Repetitive Avalanche Energy (Note 1)	E_{AR}	29		mJ	
Power Dissipation	P_D	$T_C = 25$	290	48	W
		Derate above 25	2.32	0.38	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, 1/8" from case for 5 seconds	T_L	300			

Thermal Characteristics

Parameter	Symbol	TMP10N80(G)	TMPF10N80(G)	Unit
Maximum Thermal resistance, Junction-to-Case	$R_{\theta JC}$	0.43	2.6	/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}	$V_{GS} = 0\text{ V}, I_D = 250\ \mu\text{A}$	800	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 800\text{ V}, V_{GS} = 0\text{ V}$	--	--	10	μA
		$V_{DS} = 640\text{ V}, T_C = 125^\circ\text{C}$	--	--	100	μA
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	$R_{DS(on)}$	$V_{GS} = 10\text{ V}, I_D = 4.75\text{ A}$	--	0.9	1.05	Ω
Forward Transconductance ^(Note 4)	g_{FS}	$V_{DS} = 30\text{ V}, I_D = 4.75\text{ A}$	--	6.3	--	S

DYNAMIC

Input Capacitance	C_{iss}	$V_{DS} = 25\text{ V}, V_{GS} = 0\text{ V},$ $f = 1.0\text{ MHz}$	--	2336	--	pF
Output Capacitance	C_{oss}		--	214	--	pF
Reverse Transfer Capacitance	C_{rss}		--	29	--	pF

SWITCHING

Turn-On Delay Time ^(Note 4,5)	$t_{d(on)}$	$V_{DD} = 400\text{ V}, I_D = 9.5\text{ A},$ $R_G = 25$	--	63	--	ns
Turn-On Rise Time ^(Note 4,5)	t_r		--	62	--	ns
Turn-Off Delay Time ^(Note 4,5)	$t_{d(off)}$		--	256	--	ns
Turn-Off Fall Time ^(Note 4,5)	t_f		--	72	--	ns
Total Gate Charge ^(Note 4,5)	Q_g	$V_{DS} = 640\text{ V}, I_D = 9.5\text{ A},$ $V_{GS} = 10\text{ V}$	--	53	--	nC
Gate-Source Charge ^(Note 4,5)	Q_{gs}		--	10	--	nC
Gate-Drain Charge ^(Note 4,5)	Q_{gd}		--	22.3	--	nC

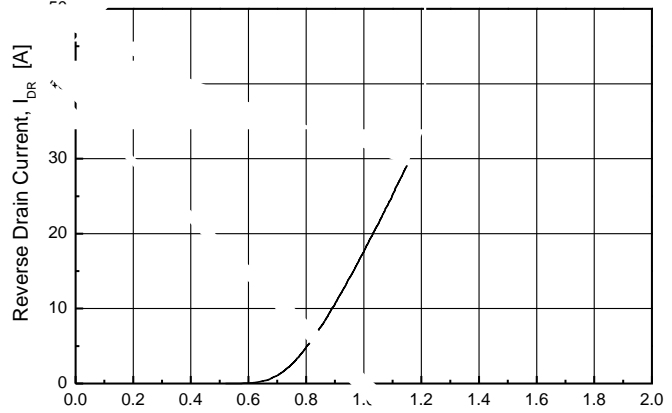
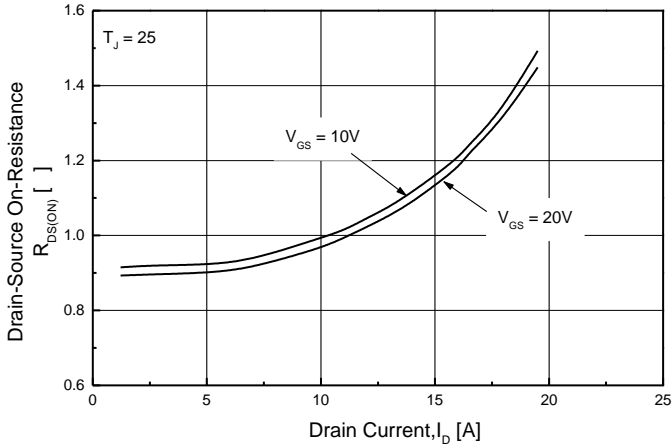
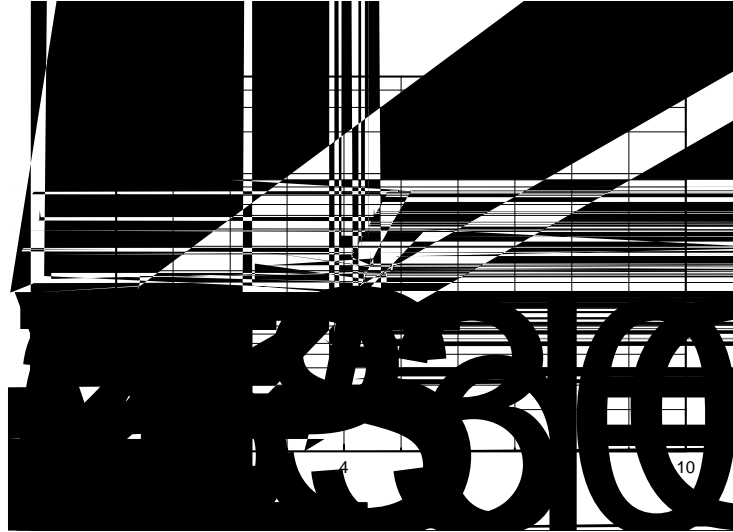
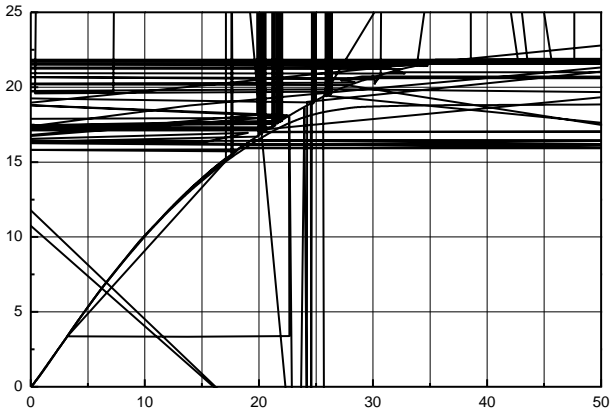
SOURCE DRAIN DIODE

Maximum Continuous Drain-Source Diode Forward Current	I_S	---	--	--	9.5	A
Maximum Pulsed Drain-Source Diode Forward Current	I_{SM}	---	--	--	38	A
Drain-Source Diode Forward Voltage	V_{SD}	$V_{GS} = 0\text{ V}, I_S = 9.5\text{ A}$	--	--	1.5	V
Reverse Recovery Time ^(Note 4)	t_{rr}	$V_{GS} = 0\text{ V}, I_S = 9.5\text{ A}$ $di_F / dt = 100\text{ A}/\mu\text{s}$	--	453	--	ns
Reverse Recovery Charge ^(Note 4)	Q_{rr}		--	5.3	--	μC

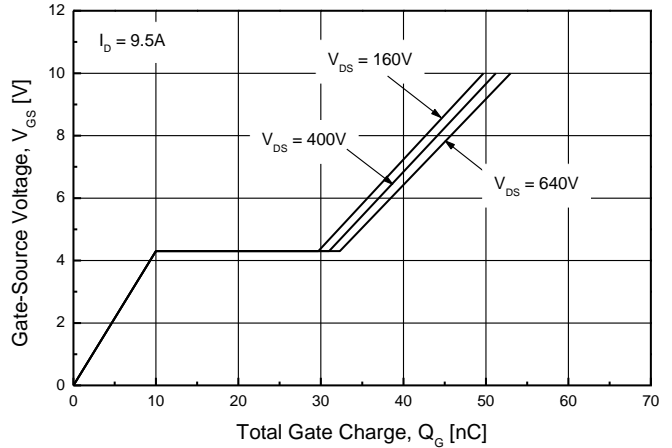
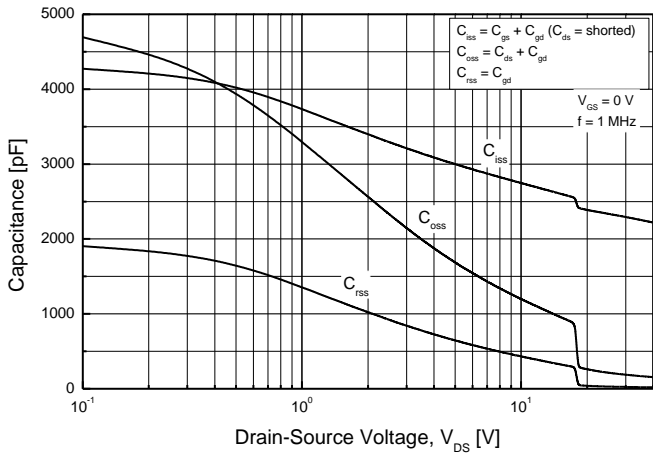
Note :

1. Repeated rating : Pulse width limited by safe operating area
2. $L=4.8\text{mH}, I_{AS} = 9.5\text{A}, V_{DD} = 50\text{V}, R_G = 25$, Starting $T_J = 25$
3. $I_{SD} = 9.5\text{A}, di/dt = 200\text{A}/\mu\text{s}, V_{DD} = BV_{DS}$, Starting $T_J = 25$
4. Pulse Test :Pulse width 300 μs , Duty Cycle 2%
5. Essentially Independent of Operating Temperature Typical Characteristics

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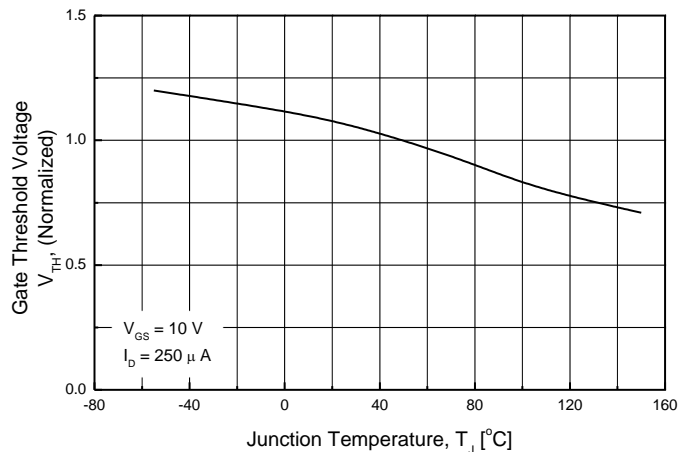
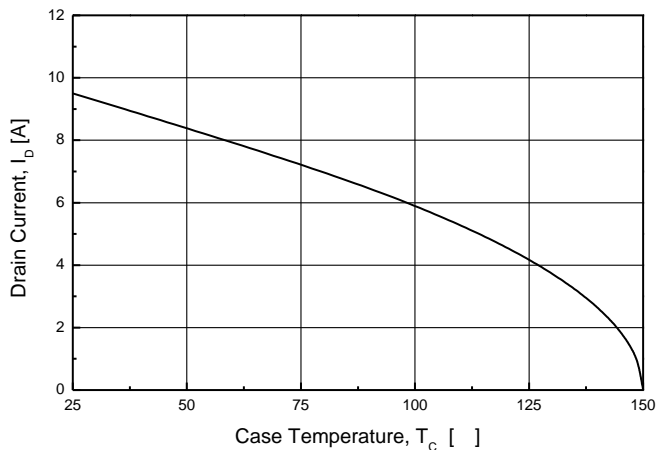
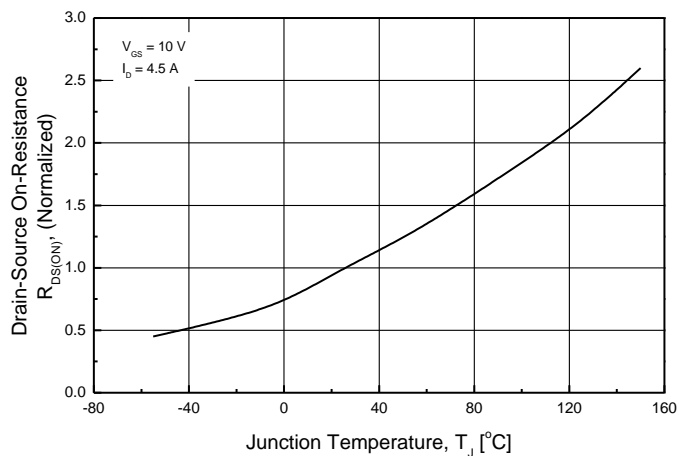
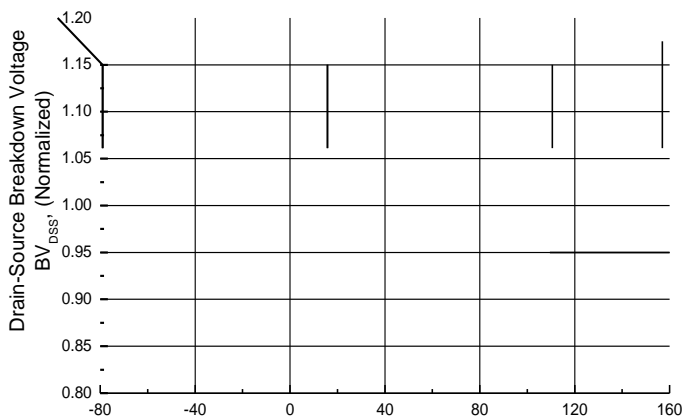


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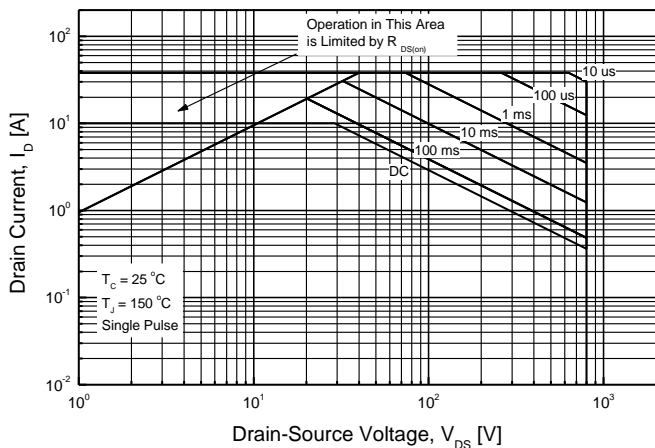


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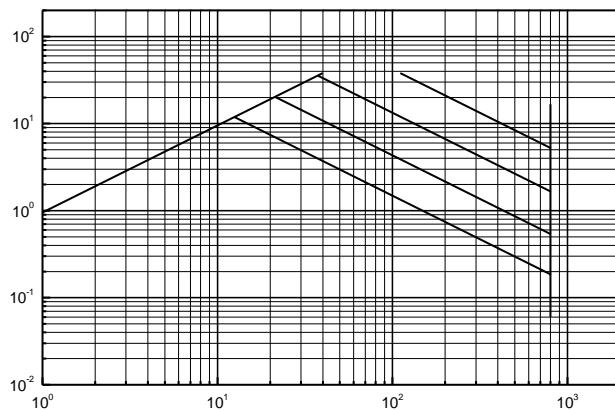
TMP10N80G/TMPF10N80G



TMP10N80(G)

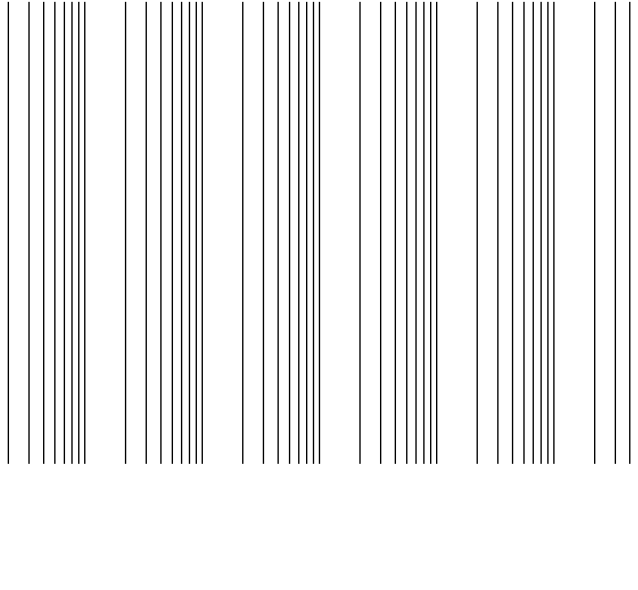


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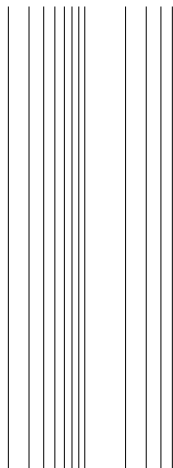




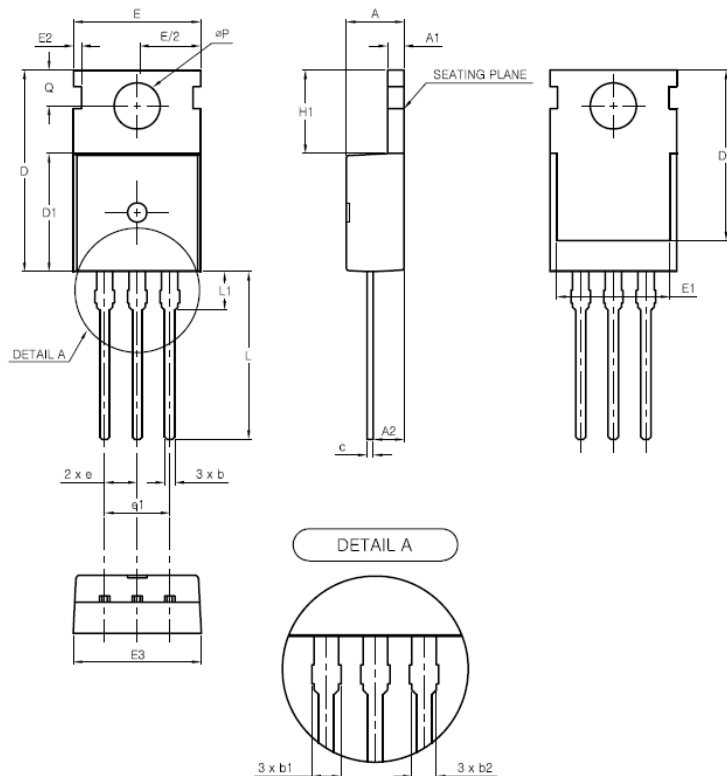
TMP10N80(G)



TMPF10N80(G)

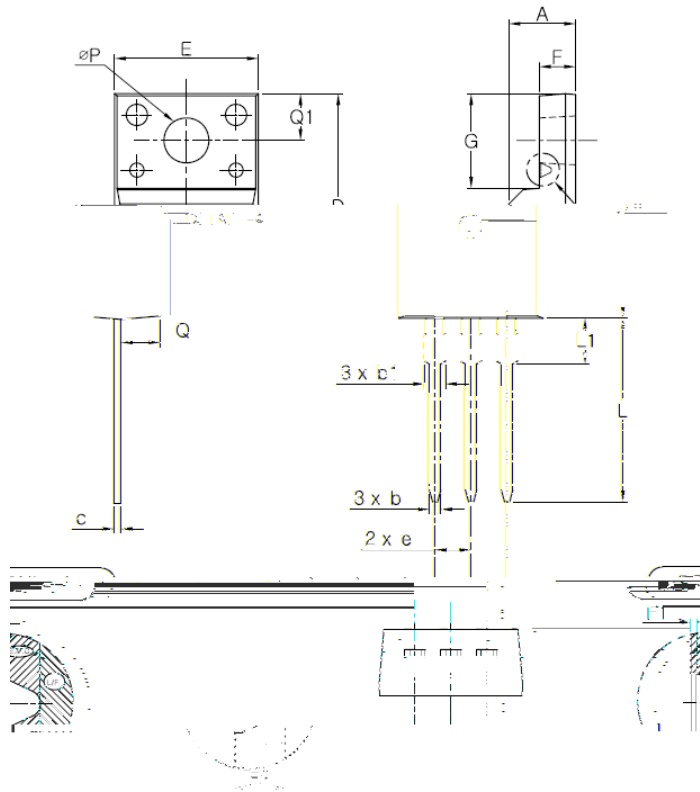


TO-220AB-3L MECHANICAL DATA



SYMBOL	MIN	NOM	MAX
A	4.30	4.50	4.70
A1	1.25	1.30	1.40
A2	2.20	2.40	2.60
b	0.70	0.80	0.90
b1	1.42	1.52	1.62
b2	1.17	1.27	1.37
c	0.45	0.50	0.60
D	15.50	15.70	15.90
D1	9.00	9.20	9.40
D2	13.10	13.30	13.50
E	9.70	9.90	10.10
E1	-	-	8.90
E2	(0.60)		
E3	9.80	10.00	10.20
e	2.54 BSC		
e1	5.08 BSC		
H1	6.30	6.50	6.70
L	12.88	13.08	13.28
L1	(3.00)		
	3.40	3.60	3.80
Q	2.70	2.80	2.90

TO-220F-3L MECHANICAL DATA



SYMBOL	MIN	NOM	MAX
A	4.50	4.70	4.90
b	0.70	0.80	0.90
b1	1.33	1.40	1.47
c	0.45	0.50	0.60
D	15.67	15.87	16.07
E	9.96	10.16	10.36
e	2.54 BSC		
F	2.34	2.54	2.74
F1	(0.10)		
F2	(0.84)		
G	6.48	6.68	6.88
L	12.78	12.98	13.18
L1	3.03	3.23	3.43
Q	2.56	2.76	2.96
Q1	3.10	3.30	3.50
	3.08	3.18	3.28

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