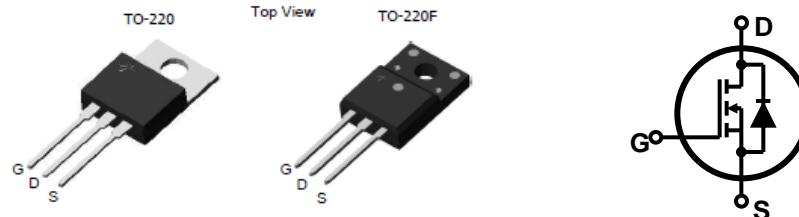


Features

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

$V_{DSS} = 550 \text{ V} @ T_{j\max}$
 $I_D = 11 \text{ A}$
 $R_{DS(ON)} = 0.67 \Omega(\text{max}) @ V_{GS} = 10 \text{ V}$



Device	Package	Marking	Remark
TMP11N50 / TMPF11N50	TO-220 / TO-220F	TMP11N50 / TMPF11N50	RoHS
TMP11N50G / TMPF11N50G	TO-220 / TO-220F	TMP11N50G / TMPF11N50G	Halogen Free

Absolute Maximum Ratings

Parameter	Symbol	TMP11N50(G)	TMPF11N50(G)	Unit
Drain-Source Voltage	V_{DSS}	500		V
Gate-Source Voltage	V_{GS}	± 30		V
Continuous Drain Current	I_D	11	11 *	A
		6	6 *	A
Pulsed Drain Current (Note 1)	I_{DM}	44	44*	A
Single Pulse Avalanche Energy (Note 2)	E_{AS}	544		mJ
Repetitive Avalanche Current (Note 1)	I_{AR}	11		A
Repetitive Avalanche Energy (Note 1)	E_{AR}	15.8		mJ
Power Dissipation	P_D	158	51.4	W
		1.26	0.41	W/°C
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		°C
Maximum lead temperature for soldering purposes, 1/8" from case for 5 seconds	T_L	300		°C

* Limited only by maximum junction temperature

Thermal Characteristics

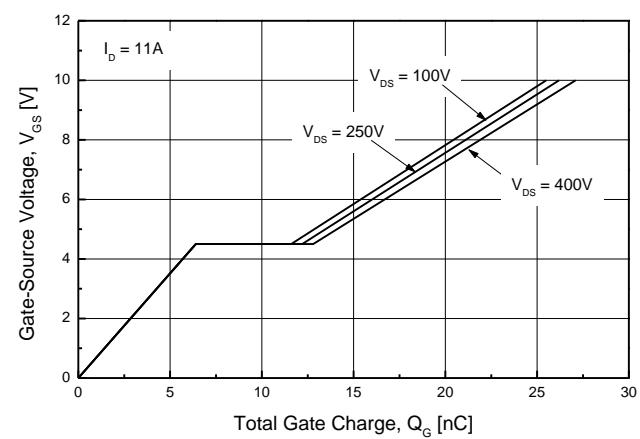
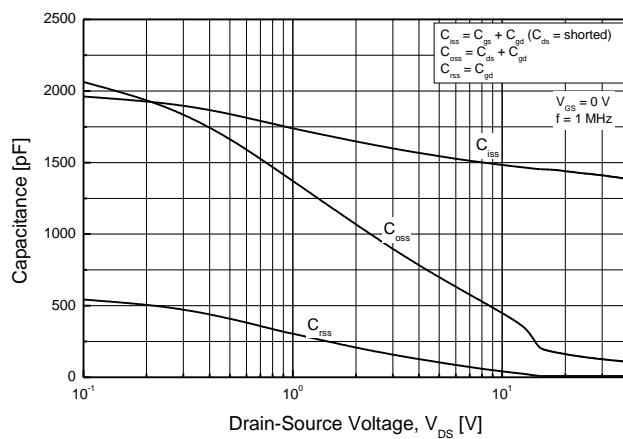
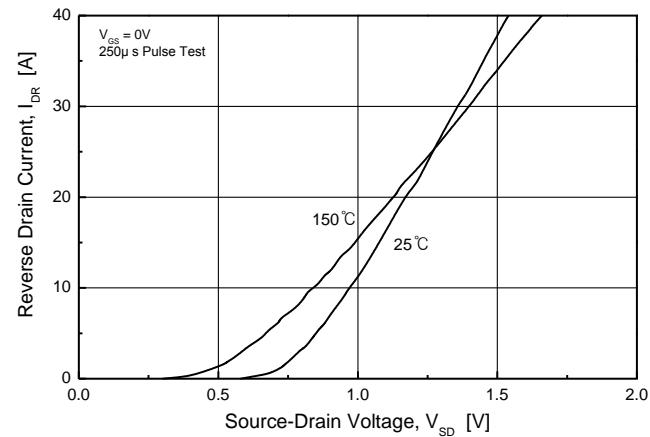
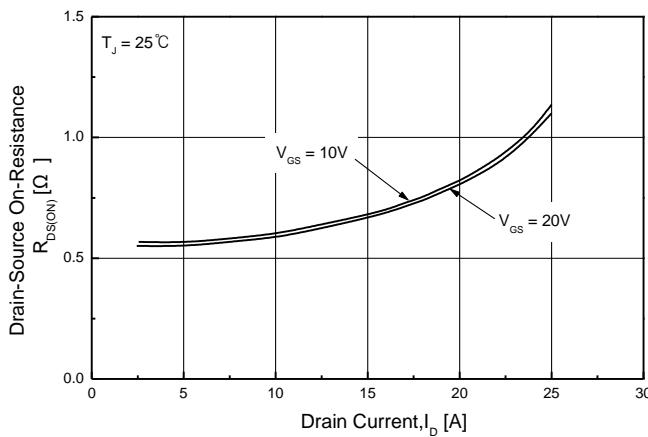
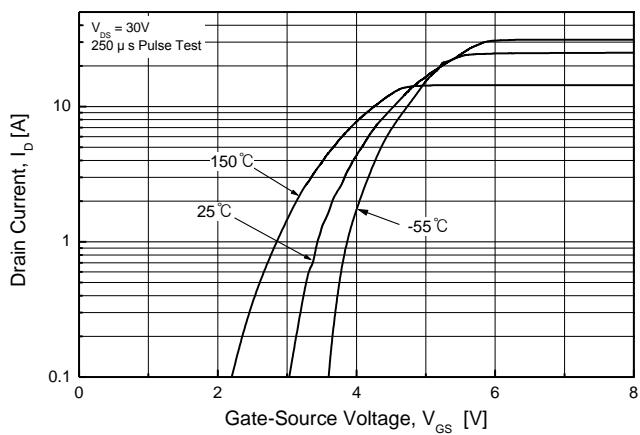
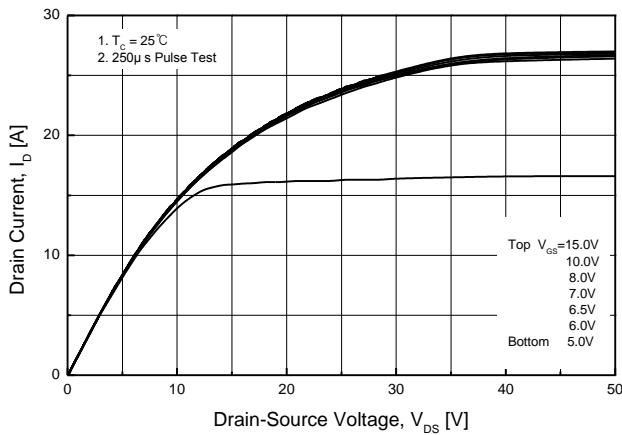
Parameter	Symbol	TMP11N50(G)	TMPF11N50(G)	Unit
Maximum Thermal resistance, Junction-to-Case	$R_{\theta JC}$	0.79	2.43	°C/W
Maximum Thermal resistance, Junction-to-Ambient	$R_{\theta JA}$	62.5	62.5	°C/W

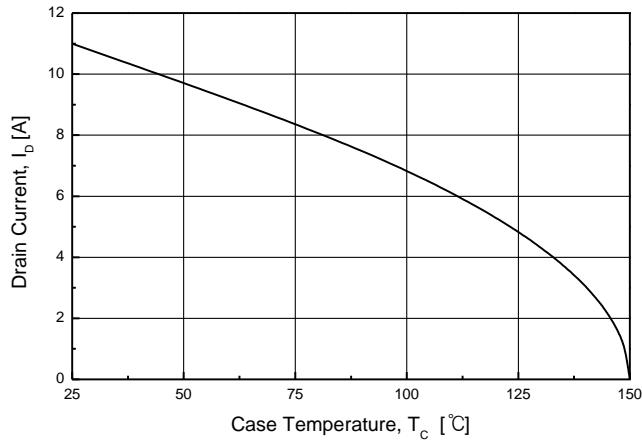
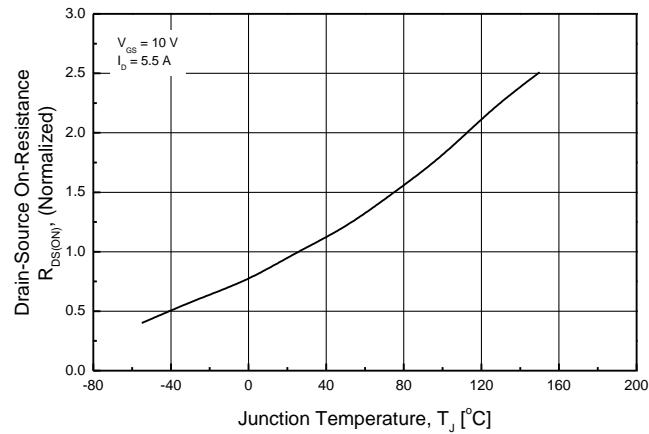
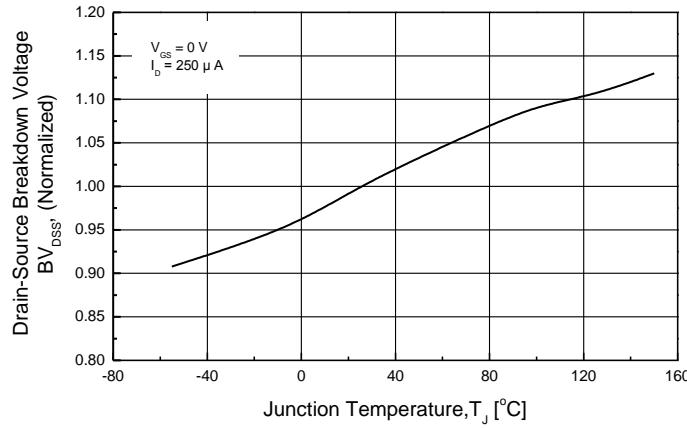
Electrical Characteristics : $T_c=25^\circ\text{C}$, unless otherwise noted

Parameter	Symbol	Test condition	Min	Typ	Max	Units
OFF						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{\text{GS}} = 0 \text{ V}, I_{\text{D}} = 250 \mu\text{A}$	500	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{\text{DS}} = 500 \text{ V}, V_{\text{GS}} = 0 \text{ V}$	--	--	1	μA
		$V_{\text{DS}} = 400 \text{ V}, T_c = 125^\circ\text{C}$	--	--	10	μA
Forward Gate-Source Leakage Current	I_{GSSF}	$V_{\text{GS}} = 30 \text{ V}, V_{\text{DS}} = 0 \text{ V}$	--	--	100	nA
Reverse Gate-Source Leakage Current	I_{GSSR}	$V_{\text{GS}} = -30 \text{ V}, V_{\text{DS}} = 0 \text{ V}$	--	--	-100	nA
ON						
Gate Threshold Voltage	$V_{\text{GS(th)}}$	$V_{\text{DS}} = V_{\text{GS}}, I_{\text{D}} = 250 \mu\text{A}$	2	--	4	V
Drain-Source On-Resistance	$R_{\text{DS(on)}}$	$V_{\text{GS}} = 10 \text{ V}, I_{\text{D}} = 5.5 \text{ A}$	--	0.54	0.67	Ω
Forward Transconductance ^(Note 4)	g_{FS}	$V_{\text{DS}} = 30 \text{ V}, I_{\text{D}} = 5.5 \text{ A}$	--	10	--	S
DYNAMIC						
Input Capacitance	C_{iss}	$V_{\text{DS}} = 25 \text{ V}, V_{\text{GS}} = 0 \text{ V}, f = 1.0 \text{ MHz}$	--	1423	--	pF
Output Capacitance	C_{oss}		--	140	--	pF
Reverse Transfer Capacitance	C_{rss}		--	8.3	--	pF
SWITCHING						
Turn-On Delay Time ^(Note 4,5)	$t_{\text{d(on)}}$	$V_{\text{DD}} = 250 \text{ V}, I_{\text{D}} = 11 \text{ A}, R_{\text{G}} = 25 \Omega$	--	50	--	ns
Turn-On Rise Time ^(Note 4,5)	t_r		--	46	--	ns
Turn-Off Delay Time ^(Note 4,5)	$t_{\text{d(off)}}$		--	124	--	ns
Turn-Off Fall Time ^(Note 4,5)	t_f		--	53	--	ns
Total Gate Charge ^(Note 4,5)	Q_g	$V_{\text{DS}} = 400 \text{ V}, I_{\text{D}} = 11 \text{ A}, V_{\text{GS}} = 10 \text{ V}$	--	28	--	nC
Gate-Source Charge ^(Note 4,5)	Q_{gs}		--	6.4	--	nC
Gate-Drain Charge ^(Note 4,5)	Q_{gd}		--	5.9	--	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}	$V_{\text{GS}} = 0 \text{ V}, I_s = 11 \text{ A}$	--	--	1.5	V
Reverse Recovery Time ^(Note 4)	t_{rr}	$V_{\text{GS}} = 0 \text{ V}, I_s = 11 \text{ A}$ $dI_F / dt = 100 \text{ A}/\mu\text{s}$	--	310	--	ns
Reverse Recovery Charge ^(Note 4)	Q_{rr}		--	2.6	--	μC

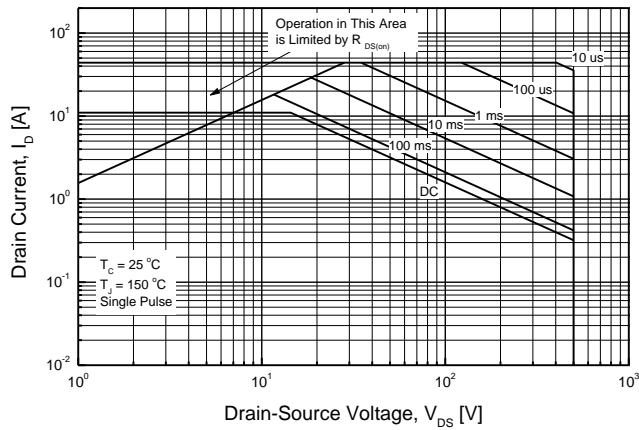
Note :

1. Repeated rating : Pulse width limited by safe operating area
2. $L=8.1\text{mH}$, $I_{\text{AS}} = 11\text{A}$, $V_{\text{DD}} = 50\text{V}$, $R_{\text{G}} = 25\Omega$, Starting $T_j = 25^\circ\text{C}$
3. $I_{\text{SD}} \leq 11\text{A}$, $di/dt \leq 200\text{A}/\mu\text{s}$, $V_{\text{DD}} \leq \text{BV}_{\text{DS}}$, Starting $T_j = 25^\circ\text{C}$
4. Pulse Test : Pulse width $\leq 300\mu\text{s}$, Duty Cycle $\leq 2\%$
5. Essentially Independent of Operating Temperature Typical Characteristics





TMP11N50(G)



TMPF11N50(G)

