



UP9T15G

Power MOSFET

N-CHANNEL ENHANCEMENT MODE POWER MOSFET

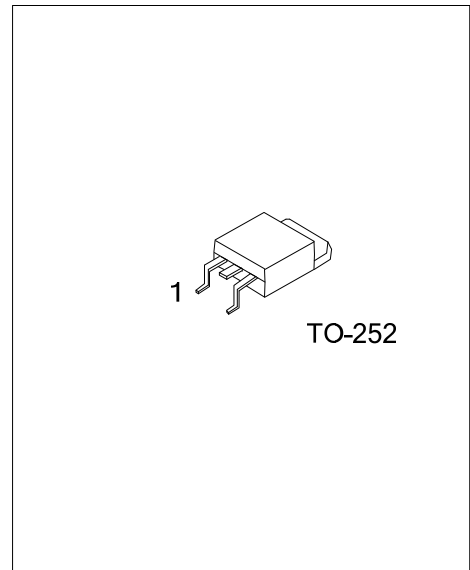
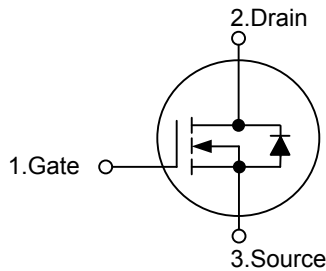
DESCRIPTION

The **UP9T15G** uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with low gate voltages. This device is suitable for use as a load switch or in PWM applications.

FEATURES

- * $V_{DS(V)}=20V$
- * $I_D=12.5A$ ($V_{GS}=4.5V$)
- * $R_{DS(ON)} < 50m\Omega$ @ $V_{GS} = 4.5 V$, $I_D = 6 A$
- * $R_{DS(ON)} < 80m\Omega$ @ $V_{GS} = 2.5 V$, $I_D = 5.2 A$

SYMBOL



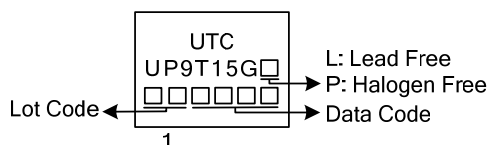
ORDERING INFORMATION

Ordering Number		Package	Pin Assignment			Packing
Lead Free	Halogen Free		1	2	3	
UP9T15GL-TN3-R	UP9T15GP-TN3-R	TO-252	G	D	S	Tape Reel

Note: Pin Assignment: G: Gate D: Drain S: Source

UP9T15GL-TN3-R	(1)Packing Type	(1) R: Tape Reel
	(2)Package Type	(2) TN3: TO-252
	(3)Green Package	(3) L: Lead Free, P: Halogen Free and Lead Free

MARKING



■ ABSOLUTE MAXIMUM RATINGS ($T_J = 25^\circ\text{C}$, unless otherwise noted)

PARAMETER	SYMBOL	RATINGS	UNIT
Drain-Source Voltage	V_{DS}	20	V
Gate-Source Voltage	V_{GS}	± 12	V
Continuous Drain Current, @ $V_{GS} = 4.5\text{V}$	I_D	12.5	A
Pulsed Drain Current	I_{DM}	60	A
Power Dissipation	P_D	12.5	W
Linear Derating Factor		0.1	W/ $^\circ\text{C}$
Junction Temperature	T_J	+150	$^\circ\text{C}$
Strong Temperature	T_{STG}	-55 ~ +150	$^\circ\text{C}$

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged.

Absolute maximum ratings are stress ratings only and functional device operation is not implied.

■ THERMAL DATA

PARAMETER	SYMBOL	MIN	TYP	MAX	UNIT
Junction-to-Ambient	θ_{JA}			110	$^\circ\text{C}/\text{W}$
Junction-to-Case	θ_{JC}			10	$^\circ\text{C}/\text{W}$

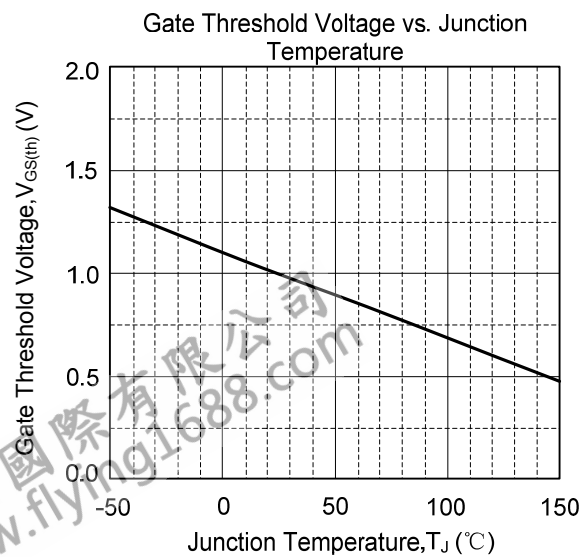
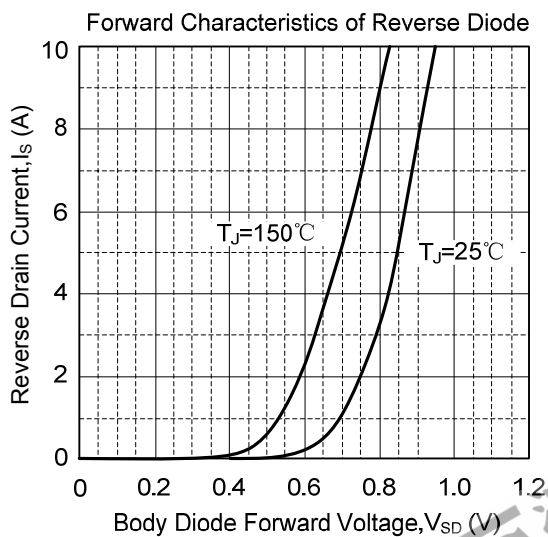
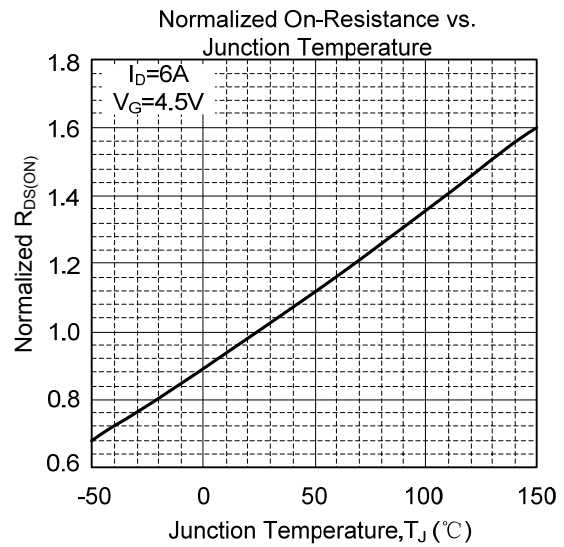
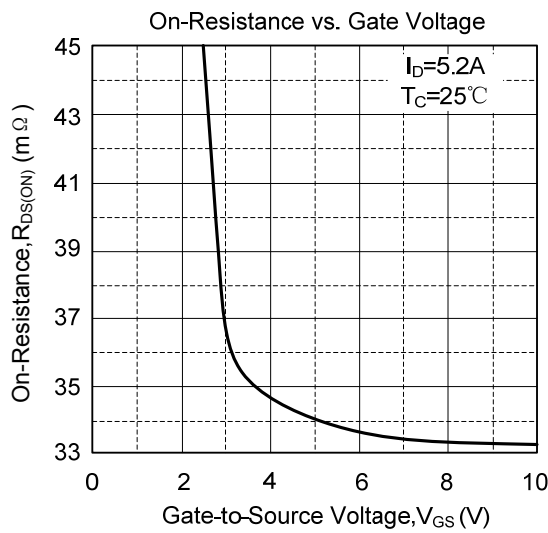
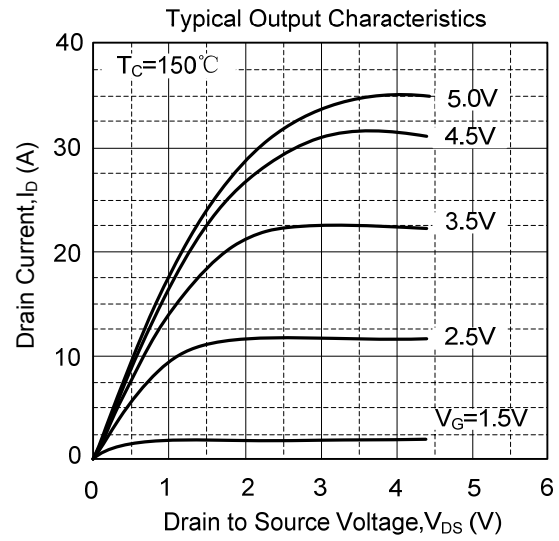
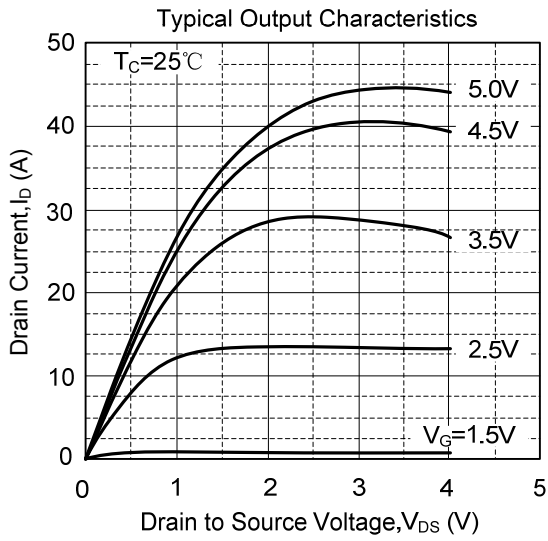
■ ELECTRICAL CHARACTERISTICS ($T_J = 25^\circ\text{C}$, unless otherwise noted)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0\text{V}, I_D = 250\ \mu\text{A}$	20			V
Drain-Source Leakage Current	I_{DSS}	$V_{DS} = 20\text{V}, V_{GS} = 0\text{V}$			1	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS} = \pm 12\text{V}$			± 100	nA
Breakdown Voltage Temperature Coefficient	$\Delta BV_{DSS}/\Delta T_J$	$25^\circ\text{C}, I_D = 1\text{mA}$		0.02		V/ $^\circ\text{C}$
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS} = V_{GS}, I_D = 250\ \mu\text{A}$	0.5		1.5	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS} = 4.5\text{V}, I_D = 6\text{A}$			50	m Ω
		$V_{GS} = 2.5\text{V}, I_D = 5.2\text{A}$			80	
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	$V_{DS} = 20\text{V}, V_{GS} = 0\text{V},$ $f = 1.0\text{MHz}$		360	580	pF
Output Capacitance	C_{OSS}			70		pF
Reverse Transfer Capacitance	C_{RSS}			50		pF
SWITCHING PARAMETERS						
Total Gate Charge(Note2)	Q_G	$V_{DS} = 16\text{V}, V_{GS} = 4.5\text{V}, I_D = 10\text{A}$		5	8	nC
Gate Source Charge	Q_{GS}			1		nC
Gate Drain Charge	Q_{GD}			2		nC
Turn-ON Delay Time(Note2)	$t_{D(ON)}$	$V_{GS} = 5\text{V}, V_{DS} = 10\text{V}, R_D = 1\ \Omega,$ $I_D = 10\text{A}, R_G = 3.3\ \Omega$		8		ns
Turn-ON Rise Time	t_R			55		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			10		ns
Turn-OFF Fall-Time	t_F			3		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Forward On Voltage(Note2)	V_{SD}	$I_S = 10\text{A}, V_{GS} = 0\text{V}$			1.3	V
Reverse Recovery Time(Note2)	t_{RR}	$I_S = 10\text{A}, V_{GS} = 0\text{V}, di/dt = 100$		17		ns
Reverse Recovery Charge	Q_{RR}	A/ μs		9		nC

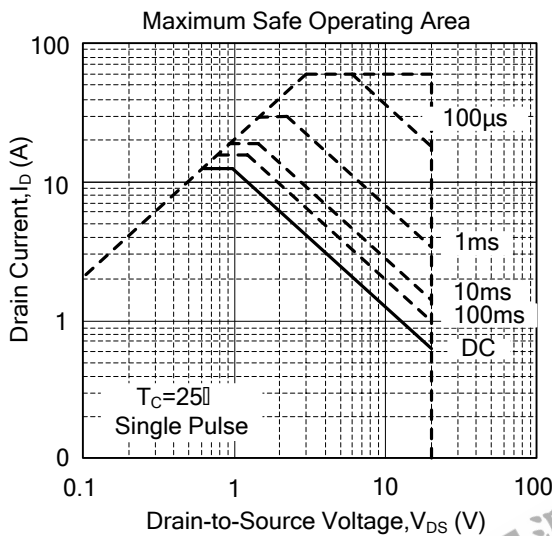
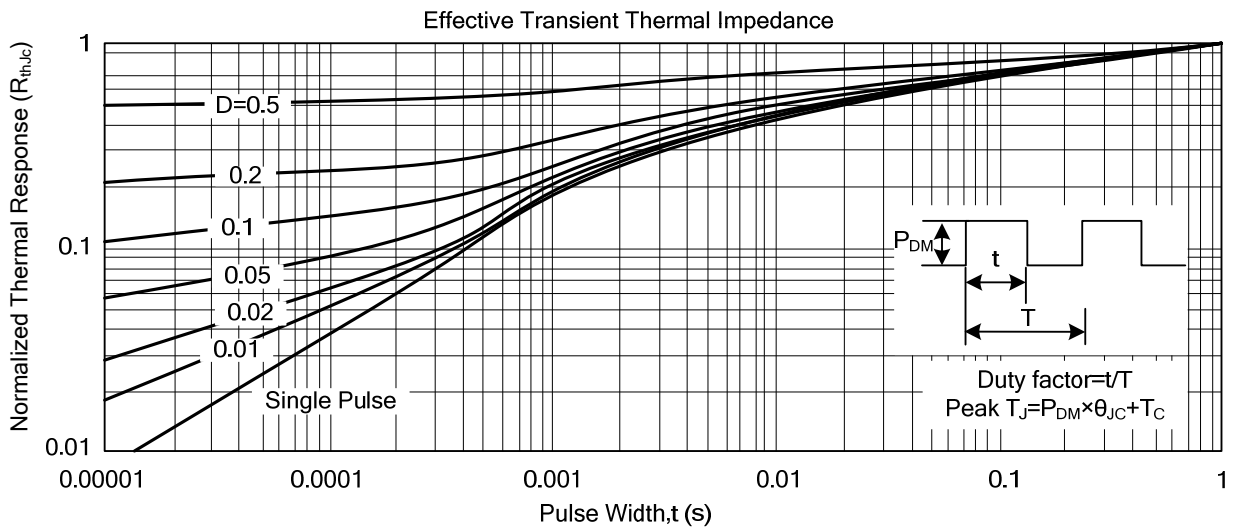
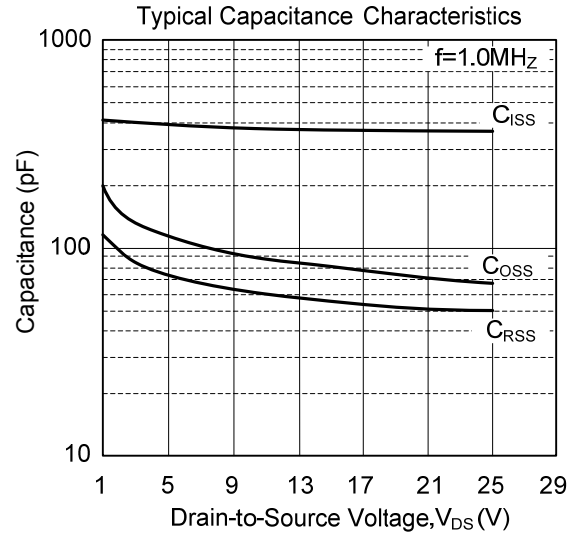
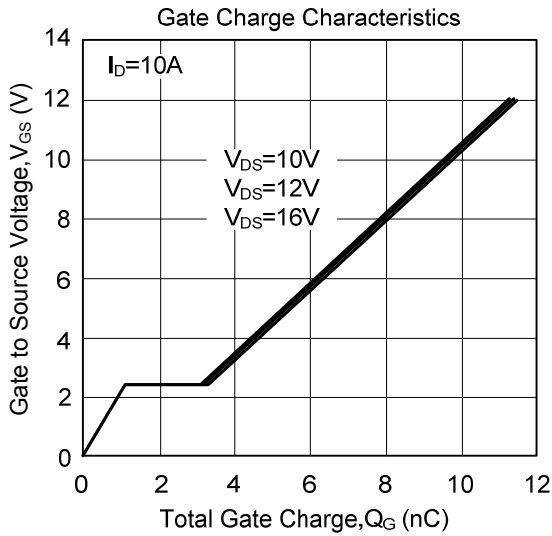
Notes: 1. Pulse width limited by safe operating area.

2. Pulse width $\leq 300\ \mu\text{s}$, duty cycle $\leq 2\%$.

TYPICAL CHARACTERISTICS



TYPICAL CHARACTERISTICS(Cont.)



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