



UP2790

Preliminary

Power MOSFET

SWITCHING N- AND P-CHANNEL POWER MOSFET

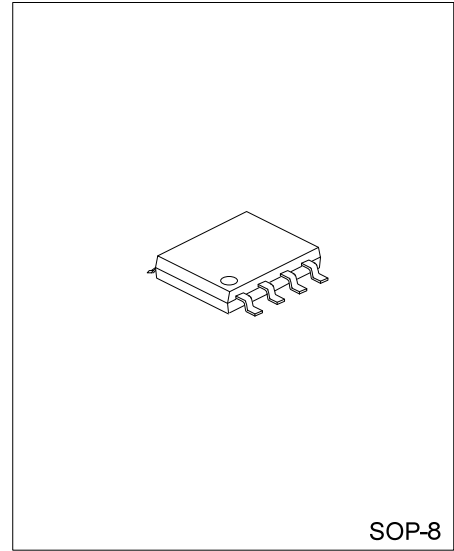
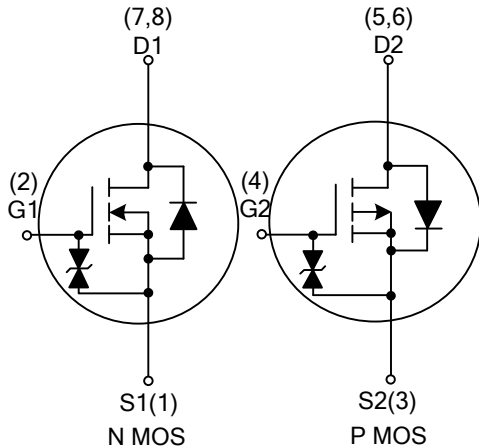
DESCRIPTION

The UTC **UP2790** uses advanced technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with low gate voltages. This device is suitable for use in Motor Drive application..

FEATURES

- * Low on-state resistance:
 - N-channel: $V_{GS} = 10V, I_D = 3A: R_{DS(ON)} = 28\ m\Omega\ (MAX)$
 - $V_{GS} = 4.5V, I_D = 3A: R_{DS(ON)} = 40\ m\Omega\ (MAX)$
 - P-channel: $V_{GS} = -10V, I_D = -3A: R_{DS(ON)} = 60\ m\Omega\ (MAX)$
 - $V_{GS} = -4.5V, I_D = -3A: R_{DS(ON)} = 80\ m\Omega\ (MAX)$
- * Low input capacitance
 - N-channel : C_{ISS} with 500 pF (Typ.)
 - P-channel : C_{ISS} with 460 pF (Typ.)
- * Built-in gate protection diode
- * Halogen Free

SYMBOL

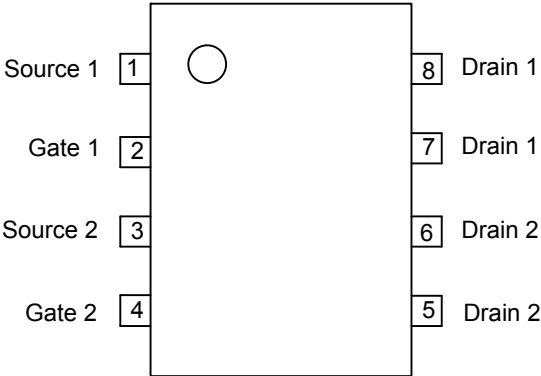


ORDERING INFORMATION

Ordering Number	Package	Packing
UP2790G-S08-R	SOP-8	Tape Reel

<p>UP2790G-S08-R</p> <ul style="list-style-type: none"> (1) Packing Type (2) Package Type (3) Halogen Free 	<ul style="list-style-type: none"> (1) R: Tape Reel (2) S08: SOP-8 (3) G: Halogen Free
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■ PIN CONFIGURATION



■ ABSOLUTE MAXIMUM RATINGS (Ta =25°C, unless otherwise specified)

N-Channel

PARAMETER	SYMBOL	RATINGS	UNIT
Drain to Source Voltage (V _{GS} =0V)	V _{DSS}	30	V
Gate to Source Voltage (V _{DS} =0V)	V _{GSS}	±20	V
Continuous Drain Current	I _D	±6	A
Pulsed Drain Current (Note 2)	I _{DM}	±24	A
Single Avalanche Current (Note 3)	I _{AS}	6	A
Single Avalanche Energy (Note 3)	E _{AS}	3.6	mJ
Power Dissipation (Note 4)	P _D	1.7	W
Junction Temperature	T _J	+150	°C
Storage Temperature	T _{STG}	-55 ~ +150	°C

P-Channel

PARAMETER	SYMBOL	RATINGS	UNIT
Drain to Source Voltage (V _{GS} =0V)	V _{DSS}	-30	V
Gate to Source Voltage (V _{DS} =0V)	V _{GSS}	±20	V
Drain Current (DC)	I _D	±6	A
Pulsed Drain Current (Note 2)	I _{DM}	±24	A
Single Avalanche Current (Note 3)	I _{AS}	-6	A
Single Avalanche Energy (Note 3)	E _{AS}	3.6	mJ
Power Dissipation (Note 4)	P _D	1.7	W
Junction Temperature	T _J	150	°C
Storage Temperature	T _{STG}	-55 ~ +150	°C

Note: 1. 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.

2. $PW \leq 10 \mu s$, Duty Cycle $\leq 1\%$
3. Mounted on ceramic substrate of $2000 \text{ mm}^2 \times 1.6 \text{ mm}$
4. $L = 0.1 \text{ mH}$, $V_{DD} = \frac{1}{2} \times V_{DSS}$, $R_G = 25 \Omega$, Starting $T_J = 25^\circ\text{C}$

■ ELECTRICAL CHARACTERISTICS (Ta =25°C, unless otherwise specified)

N-Channel

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Leakage Current	I_{DSS}	$V_{DS} = 30\text{ V}, V_{GS} = 0\text{ V}$			10	μA
Gate- Source Leakage Current	I_{GSS}	$V_{GS} = \pm 16\text{ V}, V_{DS} = 0\text{ V}$			± 10	μA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS} = 10\text{ V}, I_D = 1\text{ mA}$	1.5		2.5	V
Static Drain-Source On-State Resistance (Note)	$R_{DS(ON)}$	$V_{GS} = 10\text{ V}, I_D = 3\text{ A}$		21	28	$\text{m}\Omega$
		$V_{GS} = 4.5\text{ V}, I_D = 3\text{ A}$		28	40	$\text{m}\Omega$
		$V_{GS} = 4.0\text{ V}, I_D = 3\text{ A}$		34	53	$\text{m}\Omega$
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	$V_{DS} = 10\text{ V}, V_{GS} = 0\text{ V}, f = 1\text{ MHz}$		500		pF
Output Capacitance	C_{OSS}			135		pF
Reverse Transfer Capacitance	C_{RSS}			77		pF
SWITCHING PARAMETERS						
Turn-ON Delay Time	$t_{D(ON)}$	$V_{DD} = 15\text{ V}, V_{GS} = 10\text{ V}$ $I_D = 3\text{ A}, R_G = 10\ \Omega$		9.2		ns
Rise Time	t_R			8.8		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			28		ns
Fall-Time	t_F	$V_{DD} = 24\text{ V}, V_{GS} = 10\text{ V}, I_D = 6\text{ A}$		7.4		ns
Total Gate Charge	Q_G			12.6		nC
Gate to Source Charge	Q_{GS}			1.7		nC
Gate to Drain Charge	Q_{GD}		3.8		nC	
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Drain-Source Diode Forward Voltage	V_{SD}	$I_S = 6\text{ A}, V_{GS} = 0\text{ V}$ (Note)		0.85		V
Reverse Recovery Time	t_{RR}	$I_{DS} = 6\text{ A}, V_{GS} = 0\text{ V}, dI/dt = 100\text{ A}/\mu\text{s}$		18		ns
Reverse Recovery Charge	Q_{RR}			11		nC

P-Channel

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Leakage Current	I_{DSS}	$V_{DS} = -30\text{ V}, V_{GS} = 0\text{ V}$			-10	μA
Gate- Source Leakage Current	I_{GSS}	$V_{GS} = \pm 16\text{ V}, V_{DS} = 0\text{ V}$			± 10	μA
ON CHARACTERISTICS						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS} = -10\text{ V}, I_D = -1\text{ mA}$	-1.0		-2.5	V
Static Drain-Source On-State Resistance (Note)	$R_{DS(ON)}$	$V_{GS} = -10\text{ V}, I_D = -3\text{ A}$		43	60	$\text{m}\Omega$
		$V_{GS} = -4.5\text{ V}, I_D = -3\text{ A}$		58	80	$\text{m}\Omega$
		$V_{GS} = -4.0\text{ V}, I_D = -3\text{ A}$		65	110	$\text{m}\Omega$
DYNAMIC PARAMETERS						
Input Capacitance	C_{ISS}	$V_{DS} = -10\text{ V}, V_{GS} = 0\text{ V}, f = 1.0\text{ MHz}$		460		pF
Output Capacitance	C_{OSS}			130		pF
Reverse Transfer Capacitance	C_{RSS}			77		pF
SWITCHING PARAMETERS						
Turn-ON Delay Time	$t_{D(ON)}$	$V_{DD} = -15\text{ V}, V_{GS} = -10\text{ V}$ $I_D = -3\text{ A}, R_G = 10\ \Omega,$		8.5		ns
Turn-ON Rise Time	t_R			4.8		ns
Turn-OFF Delay Time	$t_{D(OFF)}$			42		ns
Turn-OFF Fall-Time	t_F	$V_{DD} = -24\text{ V}, V_{GS} = -10\text{ V}, I_D = -6\text{ A}$		19		ns
Total Gate Charge	Q_G			11		nC
Gate Source Charge	Q_{GS}			1.7		nC
Gate Drain Charge	Q_{GD}		3.3		nC	

■ ELECTRICAL CHARACTERISTICS(Cont.)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Drain-Source Diode Forward Voltage	V_{SD}	$I_S = 6\text{ A}$, $V_{GS} = 0\text{V}$ (Note)		0.92		V
Reverse Recovery Time	t_{RR}	$I_{DS} = 6\text{ A}$, $V_{GS} = 0\text{V}$, $dI/dt = 100\text{A}/\mu\text{s}$		21		ns
Reverse Recovery Charge	Q_{RR}			12		nC

Note: Pulsed

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