

DESCRIPTION

The MX30P15 uses advanced trench technology to provide excellent $R_{DS(ON)}$, This device is suitable for use as a load switch or in PWM applications.

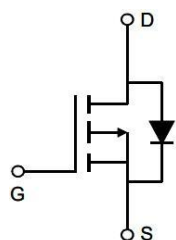
GENERAL FEATURES

- $V_{DS} = -30V$, $I_D = -15A$
 $R_{DS(ON)}(Typ.) = 11.5m\Omega$ @ $V_{GS} = -4.5V$
 $R_{DS(ON)}(Typ.) = 8.5m\Omega$ @ $V_{GS} = -10V$
- High Power and current handling capability
- Lead free product is acquired
- Surface Mount Package

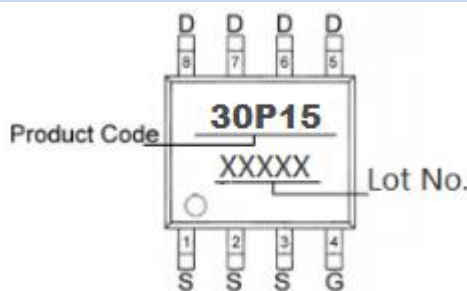
APPLICATION

- PWM applications
- Load switch
- Power management

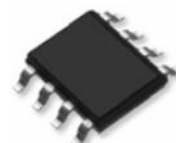
PINOUT



Schematic diagram



Marking and pin Assignment



SOP-8 top view

ORDERING INFORMATION

Part Number	Storage Temperature	Package	Devices Per Reel
MX30P15	-55°C to 150°C	SOP-8	-

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ C$ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	-30	V
Gate-Source Voltage	V_{GS}	± 20	V
Drain Current-Continuous	I_D	-15	A
Pulsed Drain Current ^(Note1)	I_{DM}	-80	A
Maximum Power Dissipation	P_D	3.1	W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	°C

THERMAL RESISTANCE

Thermal Resistance, Junction-to-Ambient ^(Note2)	$R_{\theta JA}$	40	°C/W
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Note 1. Repetitive Rating: Pulse width limited by maximum junction temperature.

Note 2. Surface Mounted on FR4 Board, $t \leq 10$ sec.



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

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
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Off Characteristics

Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS}=0V, I_D=-250\mu A$	-30	-33	-	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=-30V, V_{GS}=0V$	-	-	-1	μA
Gate-Body Leakage Current	I_{GSS}	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	± 100	nA

On Characteristics (Note 3)

Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-1.0	-1.5	-2.2	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	$V_{GS}=-4.5V, I_D=-6A$	-	11.5	15	m Ω
		$V_{GS}=-10V, I_D=-15A$	-	8.5	12	m Ω
Forward Transconductance	g_{FS}	$V_{DS}=-5V, I_D=-15A$	30	-	-	S

Dynamic Characteristics (Note 4)

Input Capacitance	C_{iss}	$V_{DS}=-15V, V_{GS}=0V, F=1.0MHz$	-	2900	-	pF
Output Capacitance	C_{oss}		-	410	-	pF
Reverse Transfer Capacitance	C_{rss}		-	280	-	pF

Switching Characteristics (Note 4)

Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=-15V, I_D=-10A, V_{GS}=-10V, R_{GEN}=3\Omega$	-	15	-	nS
Turn-on Rise Time	t_r		-	11	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	44	-	nS
Turn-Off Fall Time	t_f		-	21	-	nS
Total Gate Charge	Q_g	$V_{DS}=-15V, I_D=-10A, V_{GS}=-10V$	-	48	-	nC
Gate-Source Charge	Q_{gs}		-	12	-	nC
Gate-Drain Charge	Q_{gd}		-	14	-	nC

Drain-Source Diode Characteristics

Diode Forward Voltage (Note 3)	V_{SD}	$V_{GS}=0V, I_S=-2A$	-	-	-1.2	V
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Note 3. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.

Note 4. Guaranteed by design, not subject to product.



TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

Figure 1. Switching Test Circuit

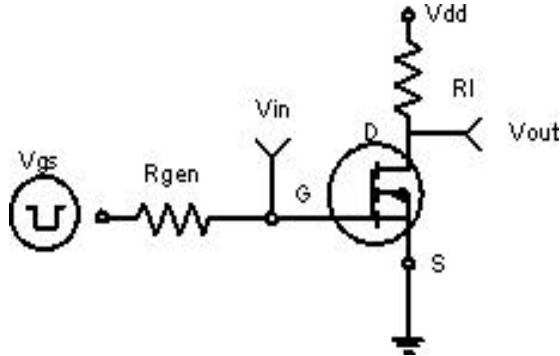


Figure 2. Switching Waveform

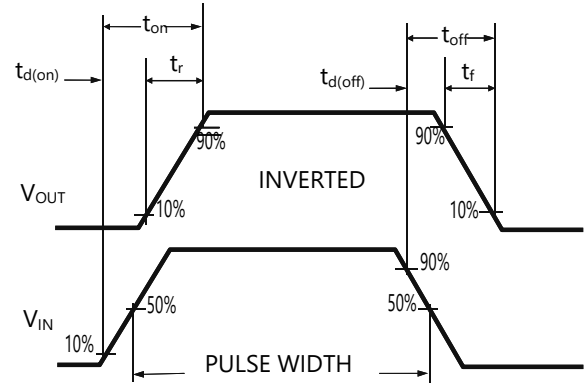


Figure 3. Power Dissipation

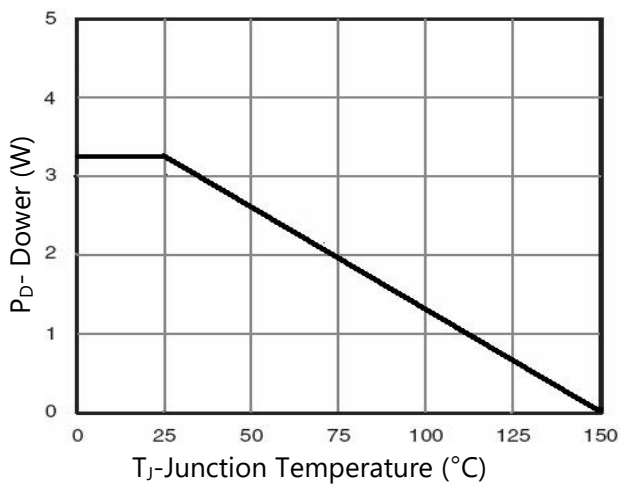


Figure 4. Safe Operation Area

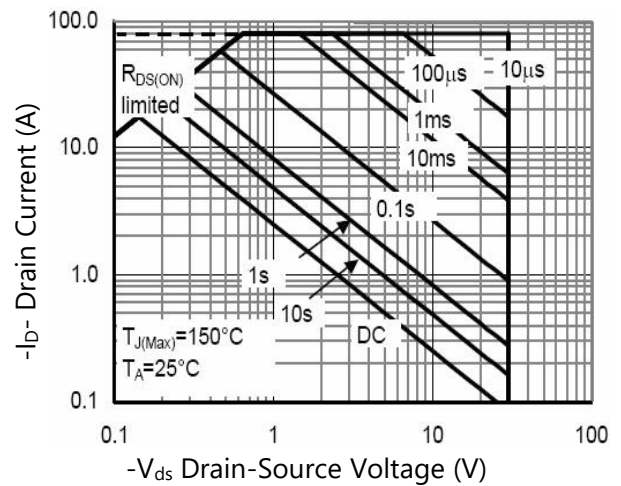


Figure 5. Output Characteristics

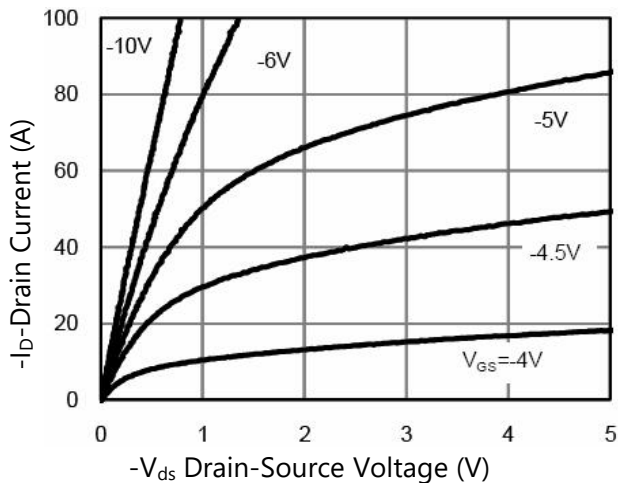
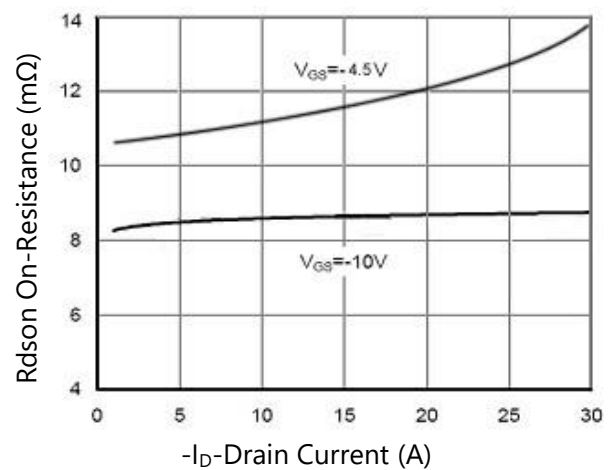


Figure 6. Rdson vs Drain Current





TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

Figure 7. Transfer Characteristics

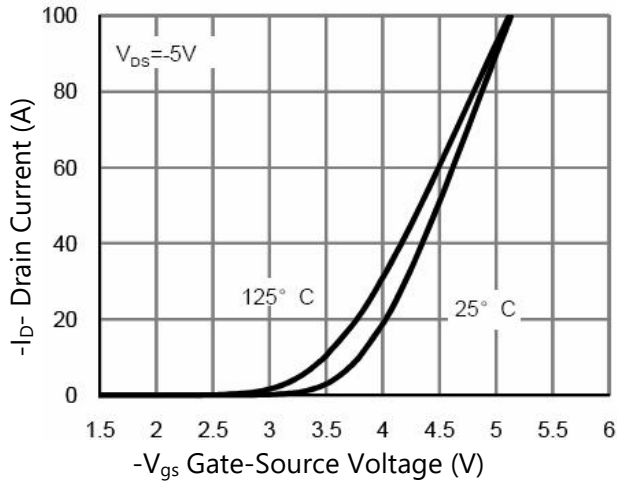


Figure 8. Rdson vs Junction Temperature

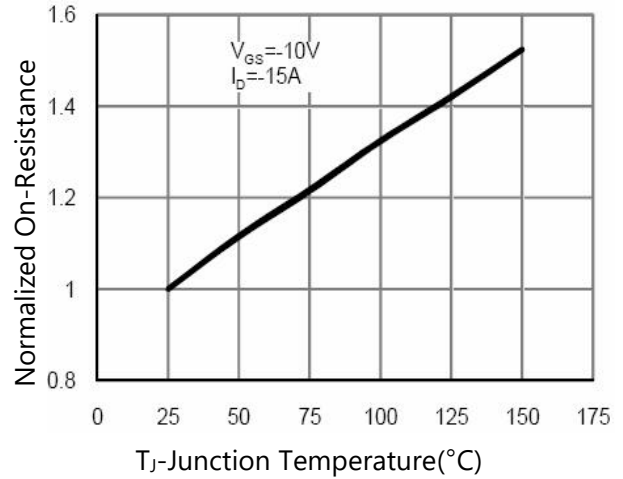


Figure 9. Rdson vs VGS

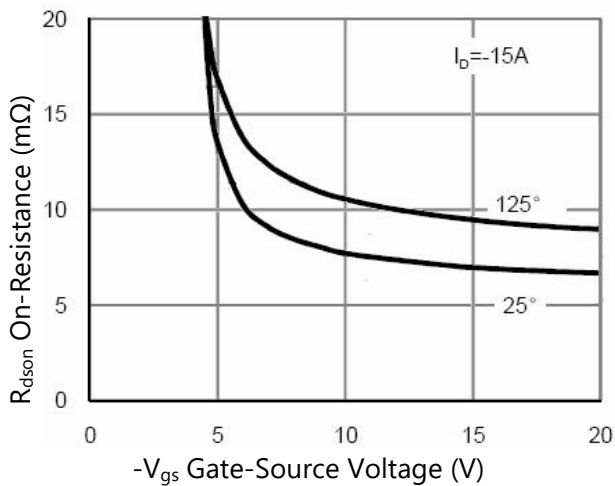


Figure 10. Capacitance vs Vds

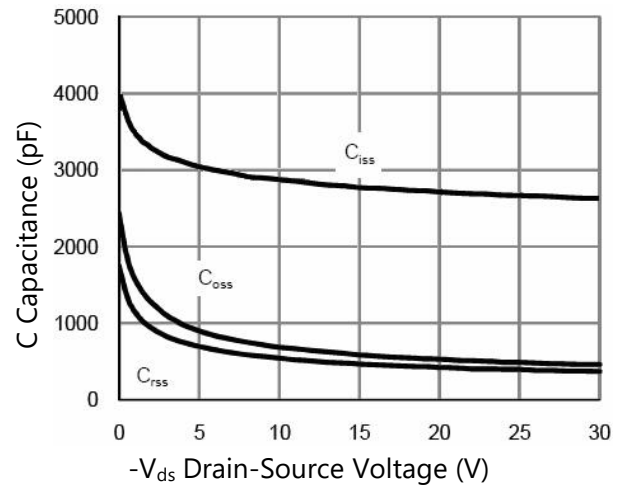


Figure 11. Gate Charge

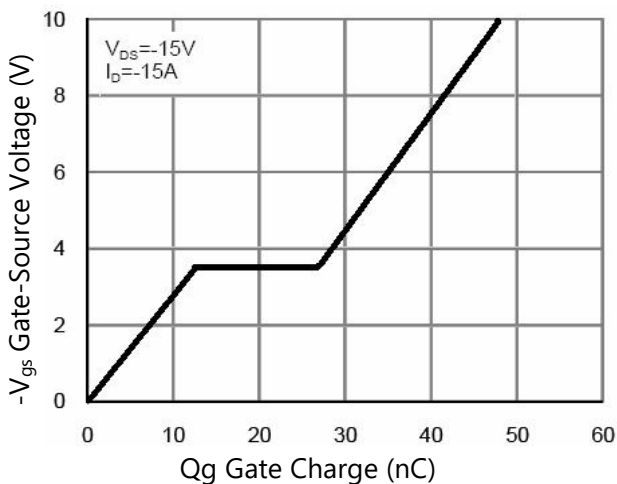
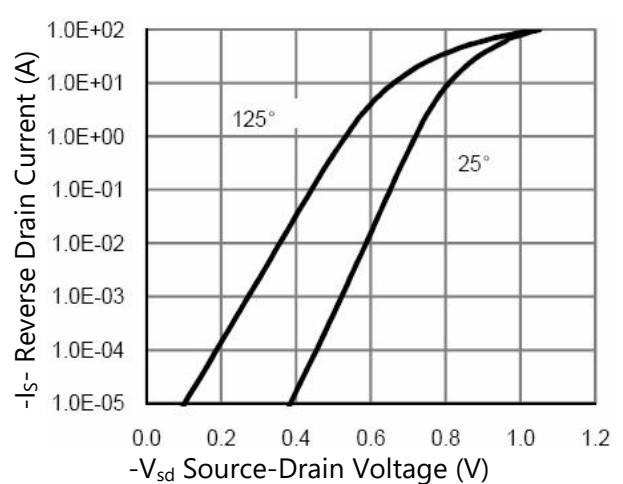


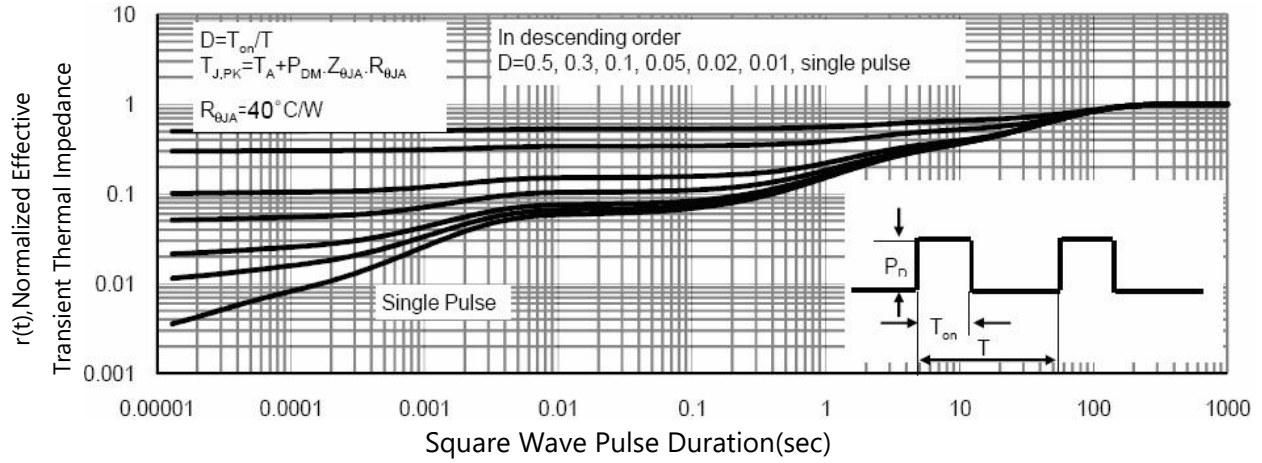
Figure 12. Source- Drain Diode Forward





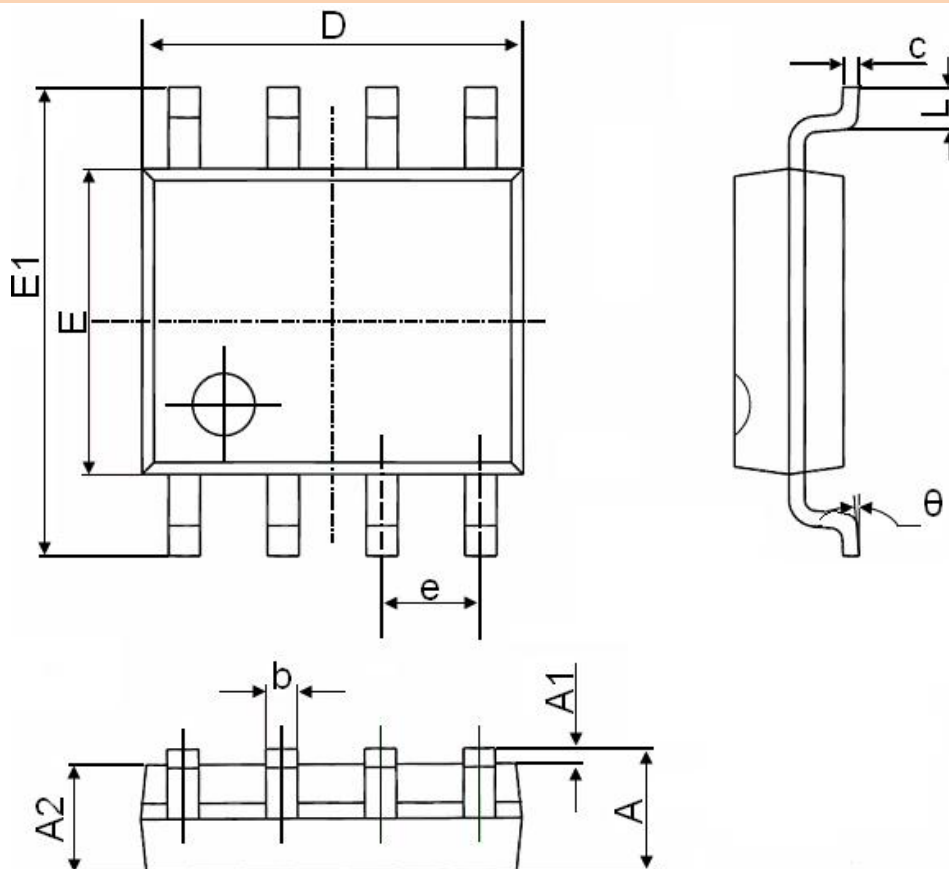
TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

Figure 13. Normalized Maximum Transient Thermal Impedance



PACKAGE INFORMATION

SOP-8



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.350	1.750	0.053	0.069
A1	0.100	0.250	0.004	0.010
A2	1.350	1.550	0.053	0.061
b	0.330	0.510	0.013	0.020
c	0.170	0.250	0.006	0.010
D	4.700	5.100	0.185	0.200
E	3.800	4.000	0.150	0.157
E1	5.800	6.200	0.228	0.244
e	1.270(BSC)		0.050(BSC)	
L	0.400	1.270	0.016	0.050
θ	0°	8°	0°	8°