DESCRIPTION

The MX6018 uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. It can be used in a wide variety of applications.

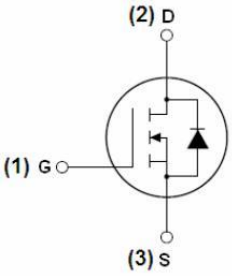
GENERAL FEATURES

- V_{DS}=60V, I_D=18A
  $R_{DS(ON)}$(Typ.)=13.5mΩ @ V_{GS}=4.5V
  $R_{DS(ON)}$(Typ.)=10mΩ @ V_{GS}=10V
- Special process technology for high ESD capability
- High density cell design for ultra low Rdson
- Fully characterized avalanche voltage and current
- Good stability and uniformity with high EAS
- Excellent package for good heat dissipation

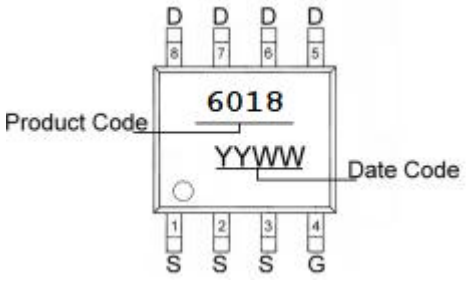
APPLICATION

- Power switching application
- Hard switched and High frequency circuits
- Uninterruptible power supply

PINOUT



Schematic diagram



Marking and pin Assignment

SOP-8 top view

ORDERING INFORMATION

Part Number	StorageTemperature	Package	Devices Per Reel
MX6018	-55°C to 150°C	SOP-8	3000

ABSOLUTE MAXIMUM RATINGS(T_C=25°C unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	60	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous	I_D	18	A
Drain Current-Continuous(T_C=100°C)	I_D(100°C)	12	A
Pulsed Drain Current(Note1)	I_{DM}	35	A
Maximum Power Dissipation	P_D	2.5	W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	°C

THERMAL RESISTANCE

Thermal Resistance, Junction-to-Case(Note2)	$R_{\theta JC}$	50	°C/W

Note 1. Repetitive Rating: Pulse width limited by maximum junction temperature.
Note 2. 2.Surface Mounted on FR4 Board, t ≤ 10 sec.

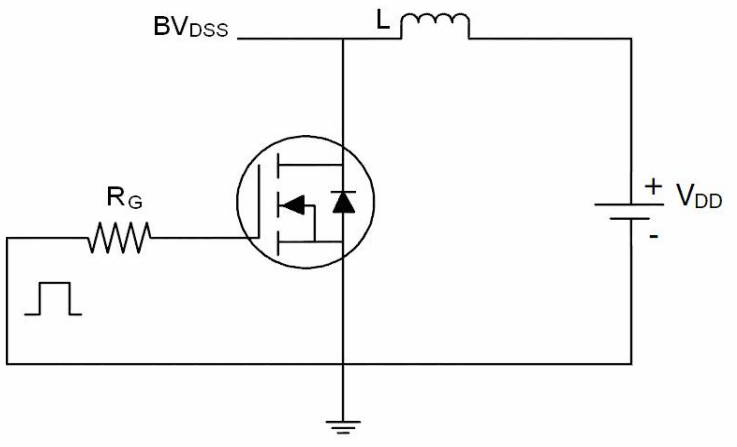
ELECTRICAL CHARACTERISTICS(T_C=25°C unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=250μA	60	-	-	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=60V, V_{GS}=0V	-	-	1	μA
Gate-Body Leakage Current	I_{GSS}	V_{GS}=±20V, V_{DS}=0V	-	-	±100	nA
On Characteristics(Note3)						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250μA	1.2	2.0	2.5	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=4.5V, I_D=10A	-	13.5	18	mΩ
		V_{GS}=10V, I_D=18A	-	10	14	mΩ
Forward Transconductance	g_{FS}	V_{DS}=10V, I_D=10A	20	-	-	S
Dynamic Characteristics(Note4)						
Input Capacitance	C_{iss}	V_{DS}=15V, V_{GS}=0V, F=1.0MHz	-	3240	-	pF
Output Capacitance	C_{oss}		-	210	-	pF
Reverse Transfer Capacitance	C_{rss}		-	146	-	pF
Switching Characteristics(Note4)						
Turn-on Delay Time	$t_{d(on)}$	V_{DD}=30V, I_D=8A, V_{GS}=10V, R_{GEN}=3Ω	-	10.6	-	nS
Turn-on Rise Time	t_r		-	9	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	65.5	-	nS
Turn-Off Fall Time	t_f		-	4.8	-	nS
Total Gate Charge	Q_g	V_{DS}=48V, I_D=8A, V_{GS}=4.5V	-	30	-	nC
Gate-Source Charge	Q_{gs}		-	10.7	-	nC
Gate-Drain Charge	Q_{gd}		-	9.4	-	nC
Drain-Source Diode Characteristics						
Diode Forward Current(Note2)	I_{SD}		-	-	8	A
Diode Forward Voltage(Note 3)	V_{SD}	V_{GS}=0V, I_S=10A	-	-	1.2	V
Reverse Recovery Time	t_{rr}	T_J=25°C, I_F=8A di/dt=100A/μs(Note3)	-	18	-	nS
Reverse Recovery Charge	Q_{rr}		-	15.6	-	nC
Forward Turn-On Time	t_{on}	Intrinsic turn-on time is negligible (turn-on is dominated by LS+LD)				

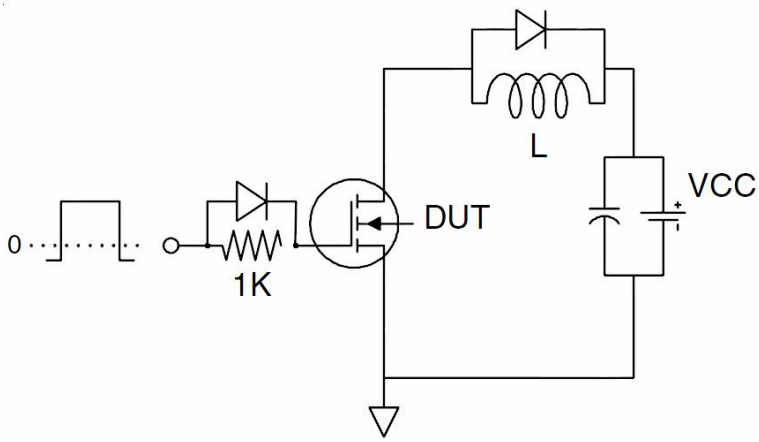
Note 2. Surface Mounted on FR4 Board, t ≤ 10 sec.
Note 3. Pulse Test: Pulse Width ≤ 300μs, Duty Cycle ≤ 2%.
Note 4. Guaranteed by design, not subject to production

TEST CIRCUIT

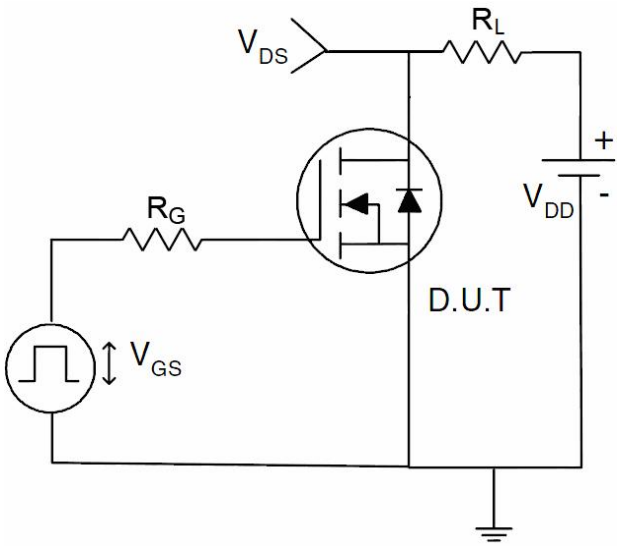
1、EAS test Circuit



2、Gate charge test Circuit



3、Switch Time Test Circuit



TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

Figure 1.Output Characteristics

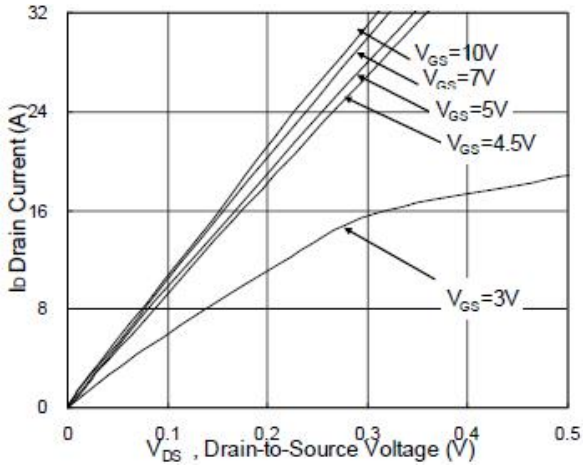


Figure 2. Transfer Characteristics

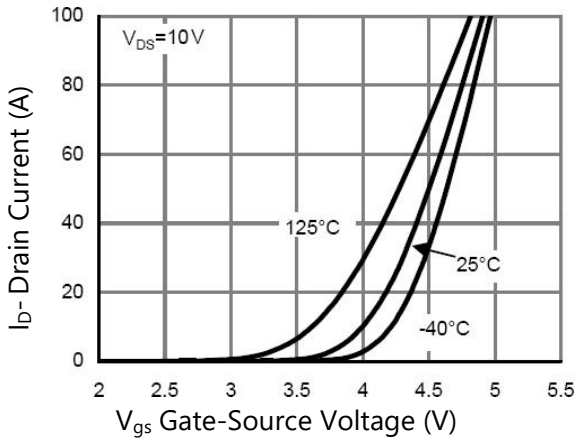


Figure 3. Rdson- Drain Current

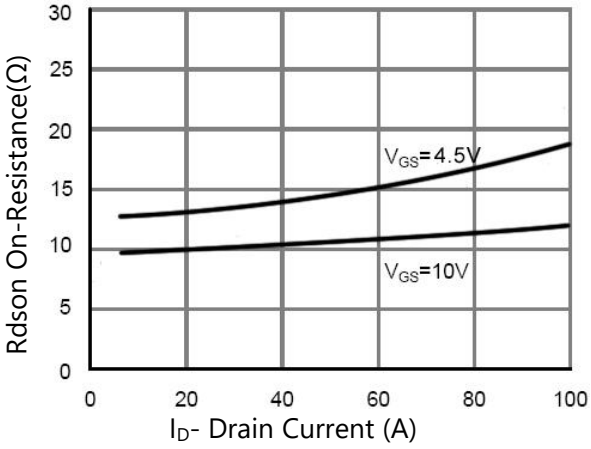


Figure 4. Rdson-JunctionTemperature

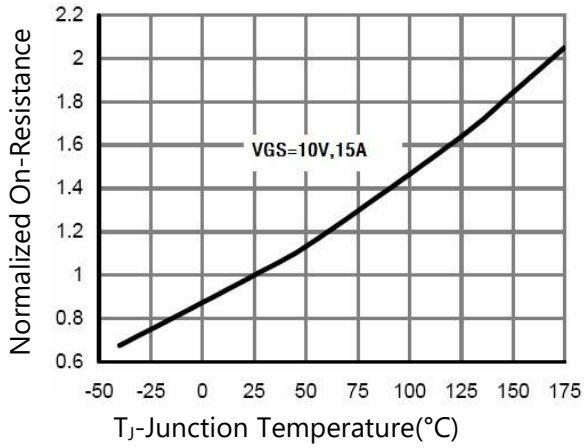


Figure 5. Gate Charge

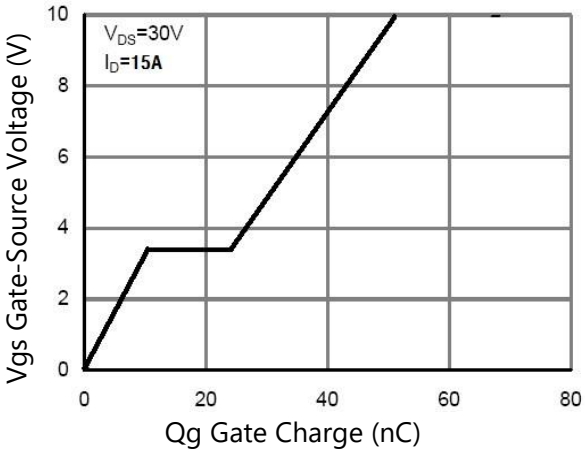
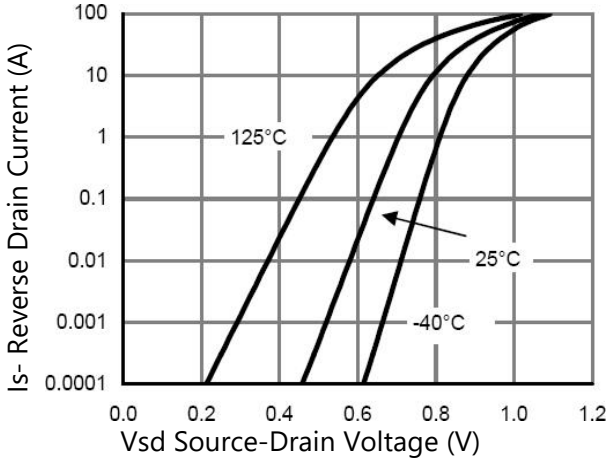


Figure 6. Source- Drain Diode Forward



TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS

Figure 7. Capacitance vs Vds

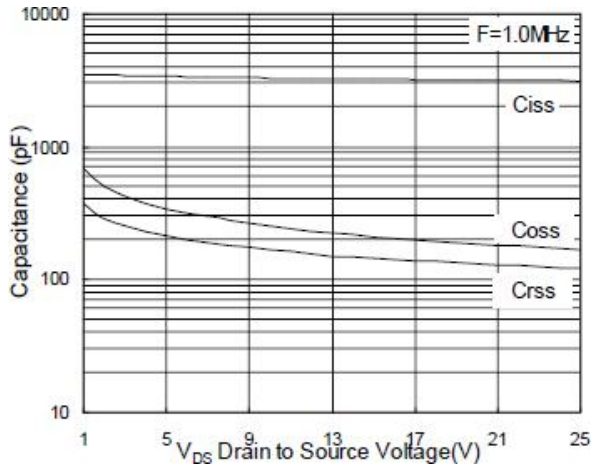


Figure 8. Safe Operation Area

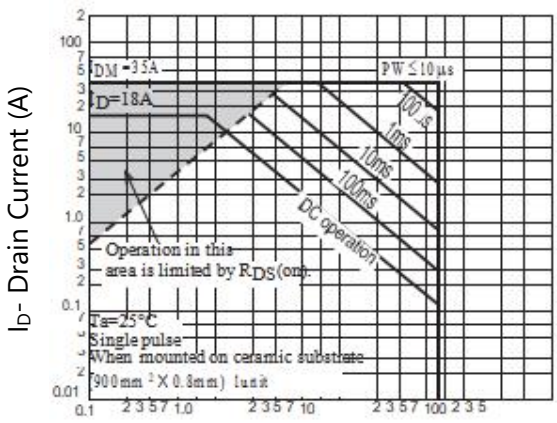


Figure 9. I_D De-rating

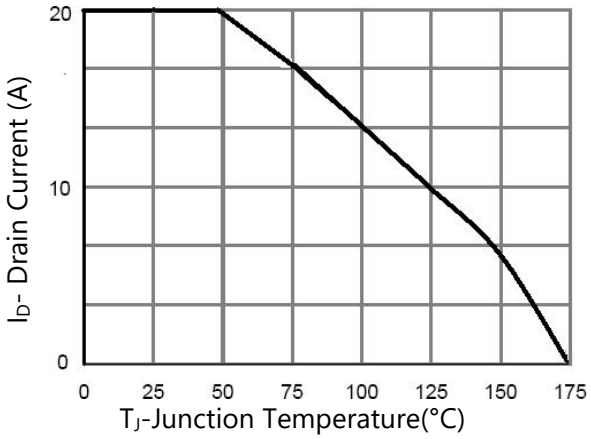


Figure 10. Power De-rating

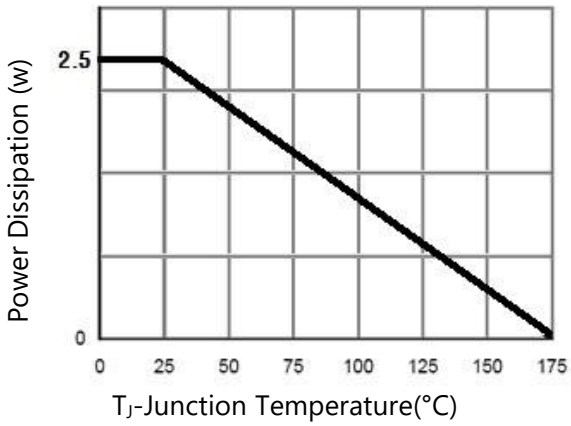
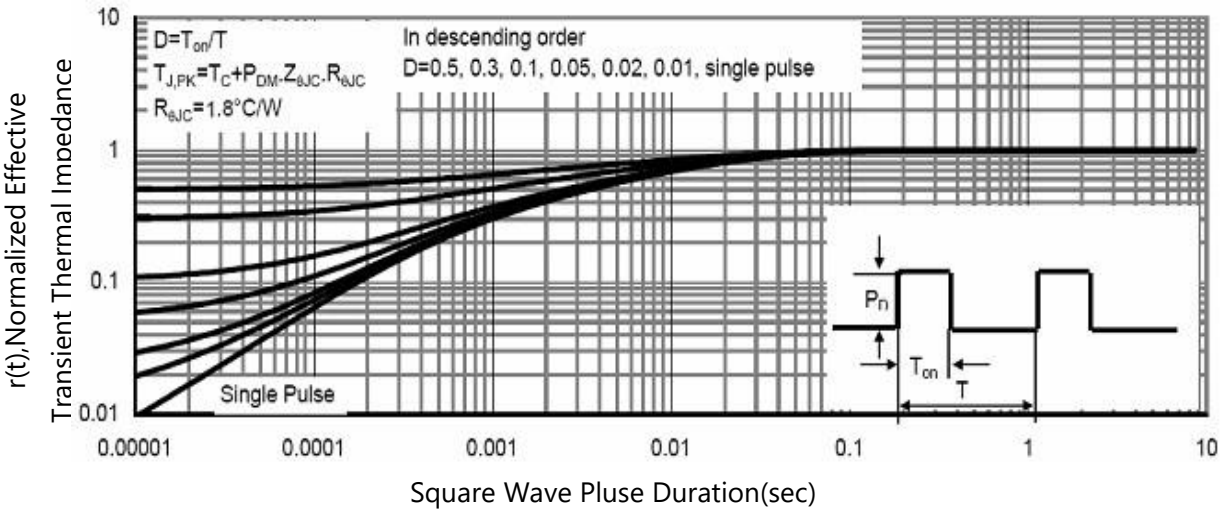
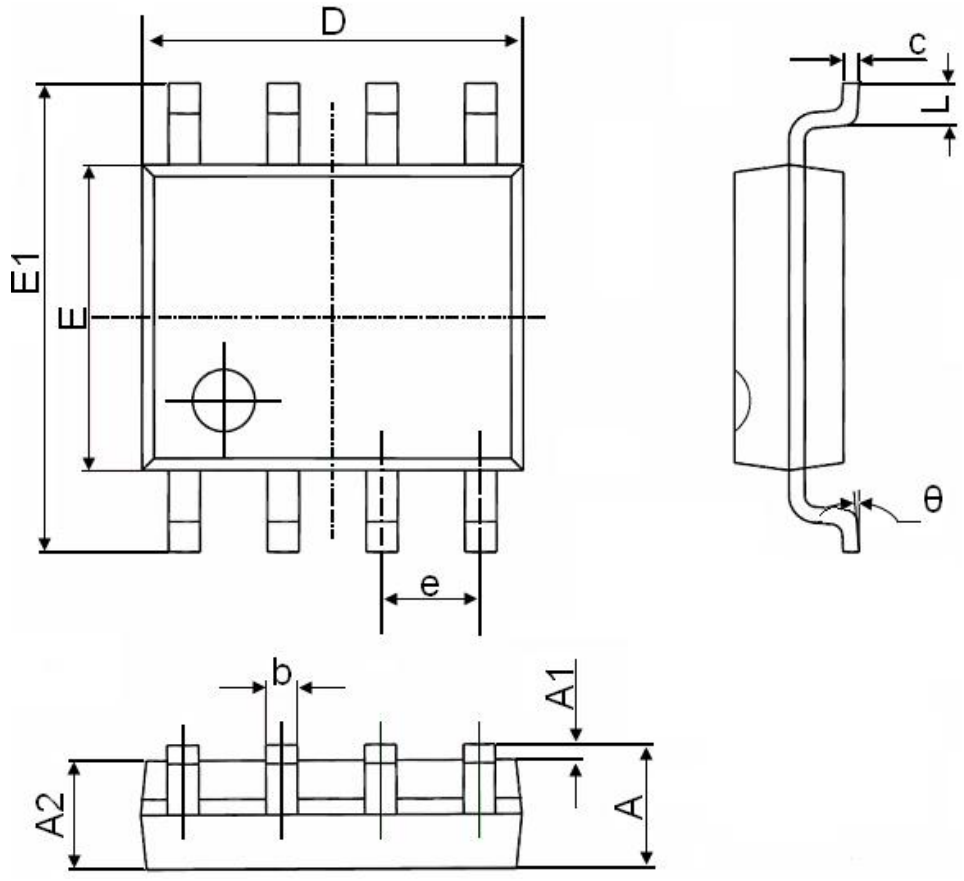


Figure 11 Normalized Maximum Transient Thermal Impedance



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°