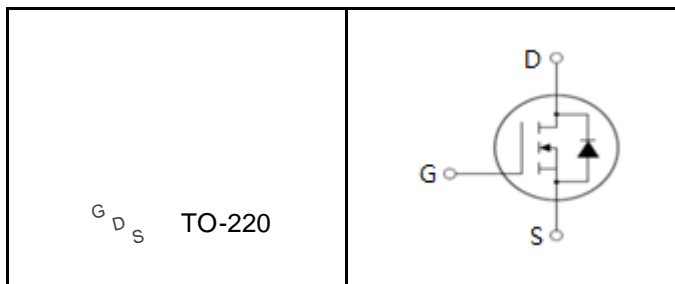




FEATURES

- $BV_{DSS}=60V, I_D=160A$
- $R_{DS(on)}:3.0m\Omega$ (Max) @ $V_{GS}=10V$
- Very low FOM $R_{DS(on)} \times Q_g$
- 100% avalanche tested
- RoHS compliant



APPLICATIONS

- Switch Mode Power Supply (SMPS)
- Uninterruptible Power Supply (UPS)
- High-Frequency Switching and Synchronous Rectification



Device Marking and Package Information		
Device	Package	Marking
MPGP06R030H	TO-220	MPGP06R030H

Absolute Maximum Ratings $T_C = 25^\circ C$, unless otherwise noted			
Parameter	Symbol	Value	Unit
Drain-Source Voltage ($V_{GS} = 0V$)	V_{DS}	60	V
Continuous Drain Current	I_D	160	A
Pulsed Drain Current (note1)	I_{DM}	480	A
Gate-Source Voltage	V_{GS}	± 20	V
Single Pulse Avalanche Energy (note2)	E_{AS}	600	mJ
Power Dissipation ($T_C = 25^\circ C$)	P_D	168	W
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55~+175	$^\circ C$

Thermal Resistance			
Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-Case	R_{thJC}	0.89	K/W
Thermal Resistance, Junction-to-Ambient	R_{thJA}	62	



Specifications $T_J = 25^\circ\text{C}$, unless otherwise noted						
Parameter	Symbol	Test Conditions	Value			Unit
			Min.	Typ.	Max.	
Static						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	60	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = 60V, V_{GS} = 0V, T_J = 25^\circ\text{C}$	--	--	1	μA
		$V_{DS} = 60V, V_{GS} = 0V, T_J = 125^\circ\text{C}$	--	--	100	
Gate-Source Leakage	I_{GSS}	$V_{GS} = \pm 20V$	--	--	± 100	nA
Gate-Source Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	2.5	--	4.5	V
Drain-Source On-Resistance (Note3)	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 20A$	--	2.7	3.0	m Ω
Gate Resistance	R_G	$f = 1.0\text{MHz}$, open drain	--	2.5	--	Ω
Dynamic						
Input Capacitance	C_{iss}	$V_{GS} = 0V,$ $V_{DS} = 25V,$ $f = 1.0\text{MHz}$	--	3771	--	pF
Output Capacitance	C_{oss}		--	1702	--	
Reverse Transfer Capacitance	C_{rss}		--	63	--	
Total Gate Charge	Q_g	$V_{DD} = 30V, I_D = 40A,$ $V_{GS} = 10V$	--	51.6	--	nC
Gate-Source Charge	Q_{gs}		--	17.4	--	
Gate-Drain Charge	Q_{gd}		--	9.9	--	
Turn-on Delay Time	$t_{d(on)}$	$V_{DD} = 30V, I_D = 40A,$ $V_{GS} = 10V, R_G = 2\Omega$	--	22	--	ns
Turn-on Rise Time	t_r		--	12	--	
Turn-off Delay Time	$t_{d(off)}$		--	15.2	--	
Turn-off Fall Time	t_f		--	15	--	
Drain-Source Body Diode Characteristics						
Continuous Body Diode Current	I_S	$T_C = 25^\circ\text{C}$	--	--	160	A
Pulsed Diode Forward Current	I_{SM}		--	--	480	
Body Diode Voltage	V_{SD}	$T_J = 25^\circ\text{C}, I_{SD} = 30A, V_{GS} = 0V$	--	0.82	1.2	V
Reverse Recovery Time	t_{rr}	$V_R = 60V, I_F = 40A,$ $di_F/dt = 300A/\mu s$	--	75	--	ns
Reverse Recovery Charge	Q_{rr}		--	81	--	nC
Peak Reverse Recovery Current	I_{rrm}		--	3	--	A

Notes

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. $L=0.5\text{mH}, V_{DD} = 30V, R_G = 25\Omega$, Starting $T_J = 25^\circ\text{C}$
3. Pulse Test: Pulse width $\leq 300\mu s$, Duty Cycle $\leq 1\%$



Typical Characteristics $T_J = 25^{\circ}\text{C}$, unless otherwise noted



Typical Characteristics $T_j = 25^{\circ}\text{C}$, unless otherwise noted

Figure A: Gate Charge Test Circuit and Waveform

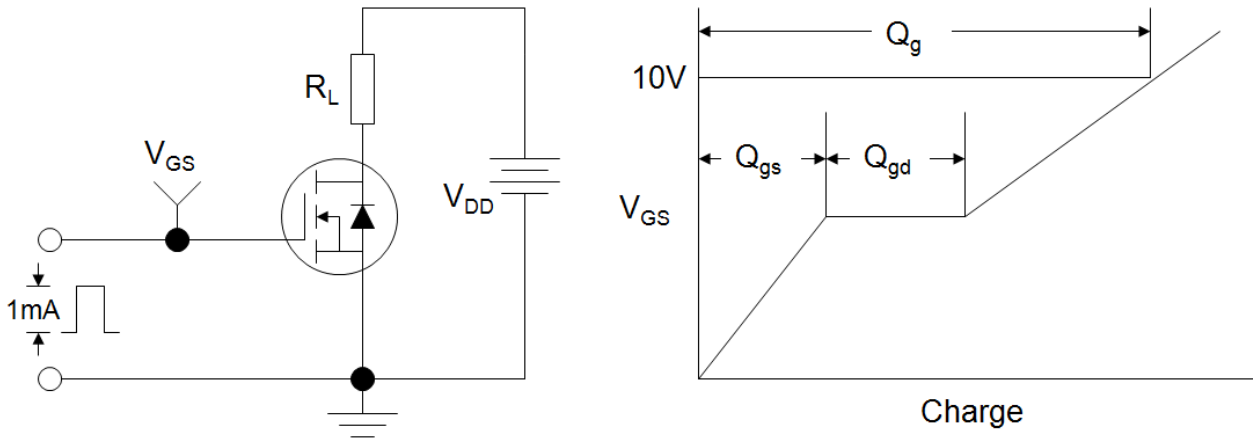


Figure B: Resistive Switching Test Circuit and Waveform

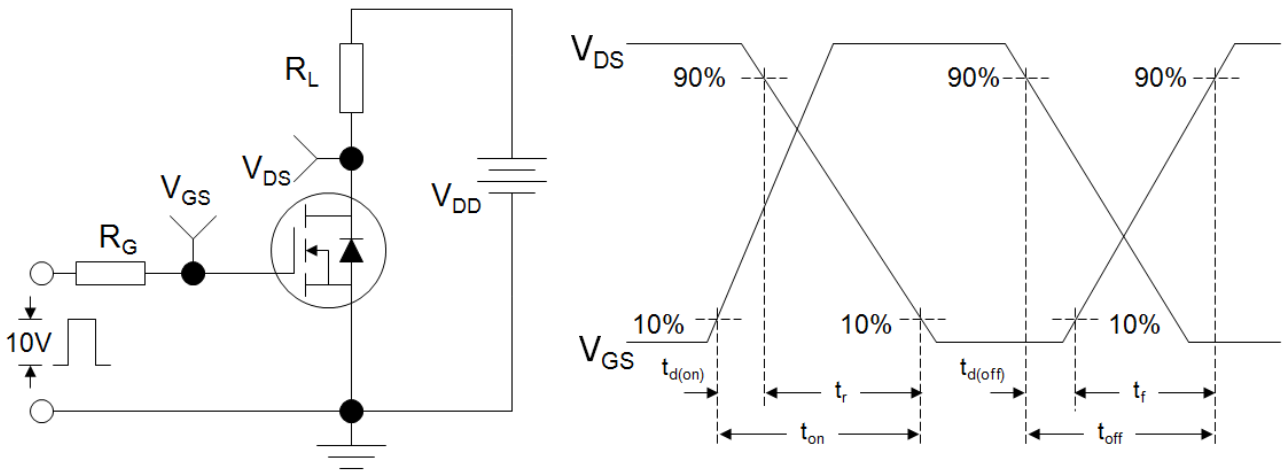
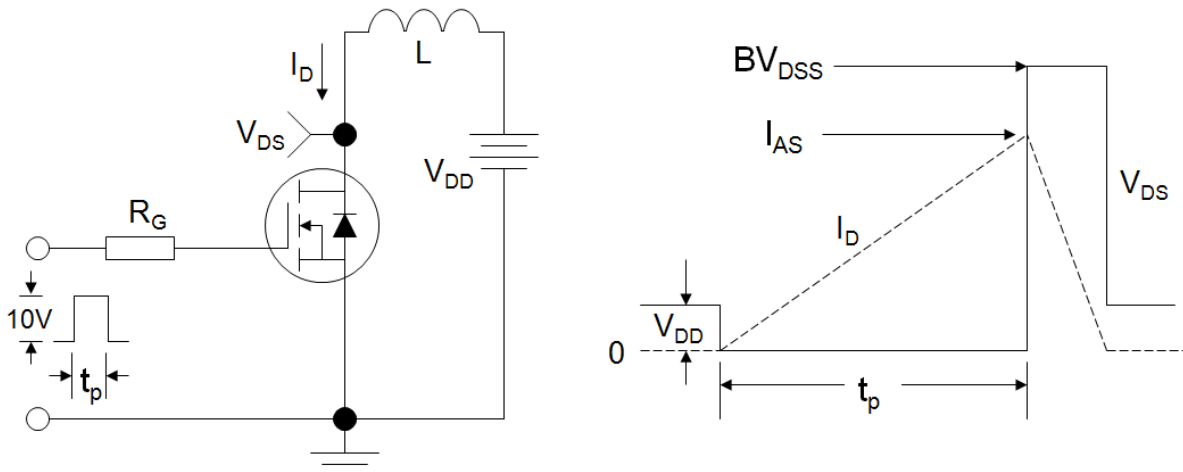
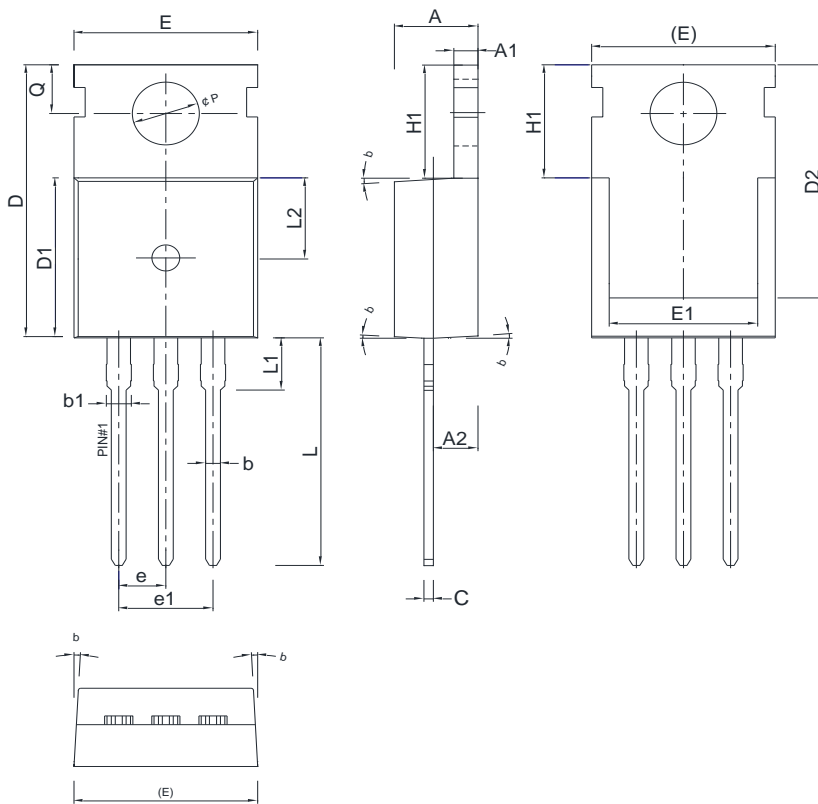


Figure C: Unclamped Inductive Switching Test Circuit and Waveform



TO-220



Symbol	mm		
	Min	Nom	Max
A	4.40	4.50	4.60
A1	1.27	1.30	1.33
A2	2.30	2.40	2.50
b	0.70	-	0.90
b1	1.27	-	1.40
c	0.45	0.50	0.60
D	15.30	15.70	16.10
D1	9.10	9.20	9.30
D2	13.10	-	13.70
E	9.70	9.90	10.20
E1	7.80	8.00	8.20
e	2.54 BSC		
e1	5.08 BSC		
H1	6.30	6.50	6.70
L	12.78	13.08	13.38
L1	-	-	3.50
L2	4.60 REF		
- 3	3.55	3.60	3.65
Q	2.73	-	2.87
1	1 \hat{U}	\hat{U}	\hat{U}