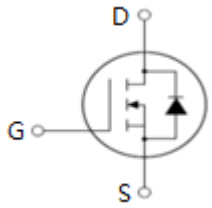
FEATURES

- z BV_{DSS}=100V, I_D =160A
- z $R_{DS(on)}$:3.3m Ÿ(Max) ! V_{GS}=10V
- Very low FOM $R_{DS(on)}$ × Q_g
- 100% avalanche tested
- RoHS compliant

G D S TO-220



APPLICATIONS

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

RoHS

Device Marking and Package Information		
Device	**Package**	**Marking**
MPGP10R033	TO-220	MPGP10R033

Absolute Maximum Ratings T_C = 25℃, unless otherwise noted			
Parameter	Symbol	Value	Unit
Drain-Source Voltage (V_{GS} = 0V)	V_{DSS}	100	V
Continuous Drain Current	I_D	160	A
Pulsed Drain Current (note1)	I_{DM}	640	A
Gate-Source Voltage	V_{GS}	f 20	V
Single Pulse Avalanche Energy (note2)	E_{AS}	240	mJ
Power Dissipation (T_C = 25℃)	P_D	245	W
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55~+175	℃

Thermal Resistance			
Parameter	**Symbol**	**Value**	**Unit**
Thermal Resistance, Junction-to-Case Max	R_{thJC}	0.61	K/W
Thermal Resistance, Junction-to-Ambient	R_{thJA}	60	

Specifications T_J = 25ºC, 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 = 250μA	100	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = 100V, V_{GS} = 0V, T_J = 25ºC	--	--	1	μA
		V_{DS} = 100V, V_{GS} = 0V, T_J = 125ºC	--	--	100	
Gate-Source Leakage	I_{GSS}	V_{GS} = ±20V	--	--	±100	nA
Gate-Source Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = 250μA	2.0	--	4.0	V
Drain-Source On-Resistance (Note3)	$R_{DS(on)}$	V_{GS} = 10V, I_D = 80A	--	3.0	3.3	mΩ
Gate Resistance	R_G	f = 1.0MHz, open drain	--	1.9	--	Ω
Dynamic						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = 50V, f = 1.0MHz	--	4950	--	pF
Output Capacitance	C_{oss}		--	1692	--	
Reverse Transfer Capacitance	C_{rss}		--	43	--	
Total Gate Charge	Q_g	V_{DD} = 50V , I_D = 80A, V_{GS} = 10V	--	120	--	nC
Gate-Source Charge	Q_{gs}		--	31.8	--	
Gate-Drain Charge	Q_{gd}		--	24	--	
Turn-on Delay Time	$t_{d(on)}$	V_{DD} = 50V , I_D = 80A , V_{GS} = 10V, R_G = 2.4Ω	--	94	--	ns
Turn-on Rise Time	t_r		--	142	--	
Turn-off Delay Time	$t_{d(off)}$		--	306	--	
Turn-off Fall Time	t_f		--	120	--	
Drain-Source Body Diode Characteristics						
Continuous Body Diode Current	I_S	T_C = 25ºC	--	--	160	A
Pulsed Diode Forward Current	I_{SM}		--	--	480	
Body Diode Voltage	V_{SD}	T_J = 25ºC, I_{SD} = 80A, V_{GS} = 0V	--	0.82	1.2	V
Reverse Recovery Time	t_{rr}	V_R = 100V , I_F = 80A, di_F/dt = 100A/μs	--	78	--	ns
Reverse Recovery Charge	Q_{rr}		--	12	--	nC
Peak Reverse Recovery Current	I_{rrm}		--	3	--	A

Notes

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. L=0.5mH, V_{DD} = 50V, R_G = 25Ω, Starting T_J = 25°C
3. Pulse Test: Pulse width ≤ 300μs, Duty Cycle ≤ 1%

&) ! (' % (+%,! 4(/ '

&) ! (' % (+%,! 4(/ '

Figure A：Gate Charge Test Circuit and Waveform

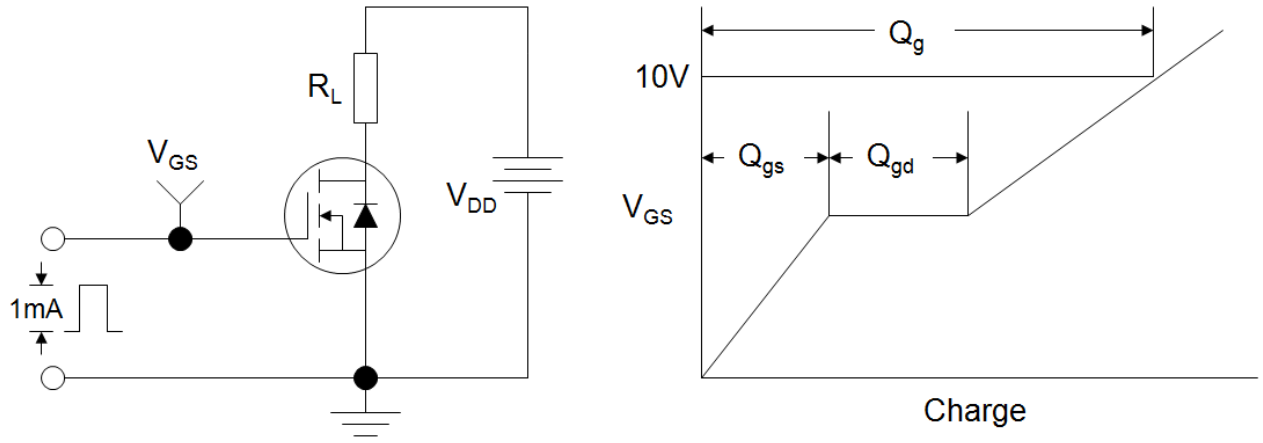


Figure B：Resistive Switching Test Circuit and Waveform

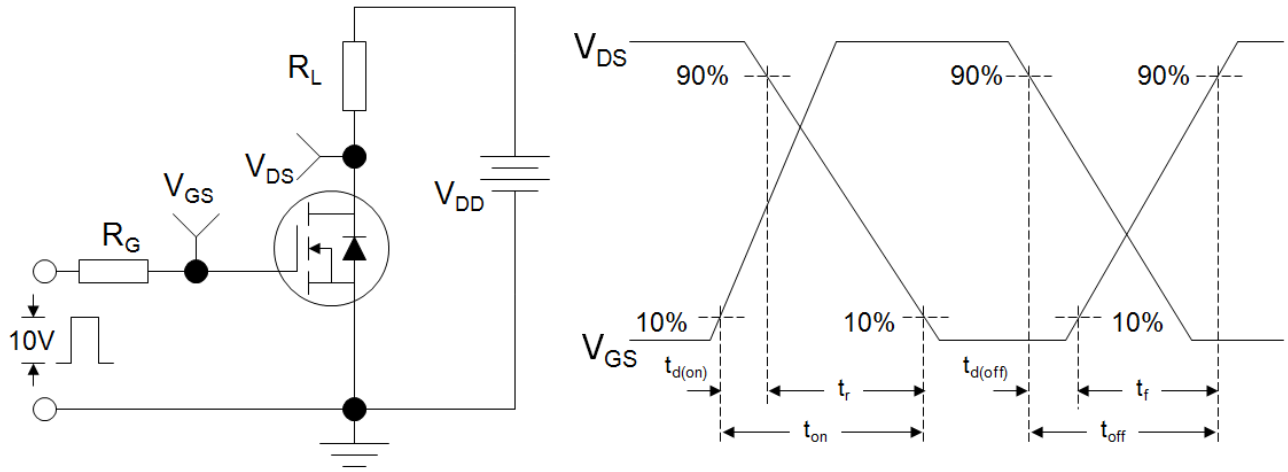
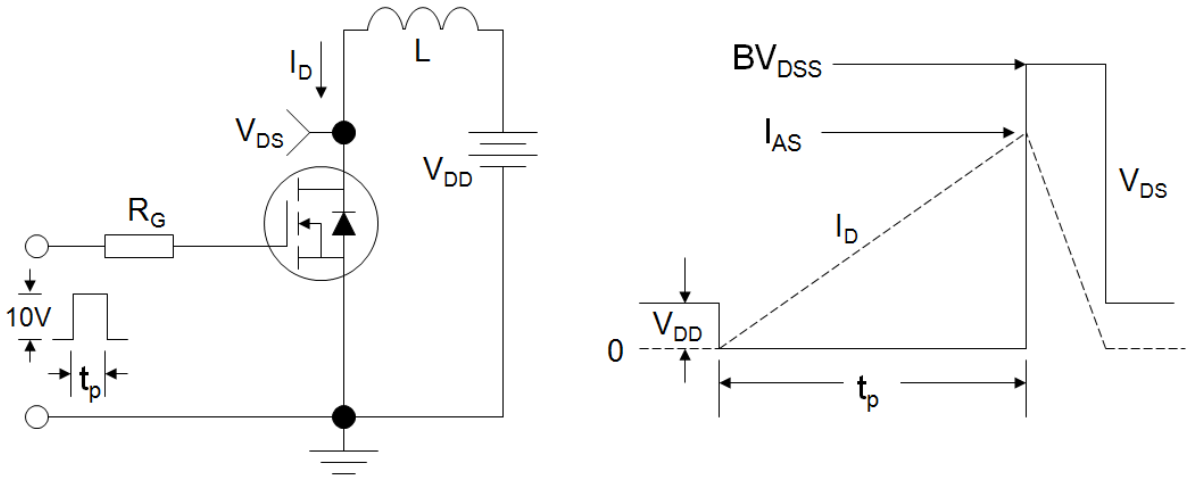
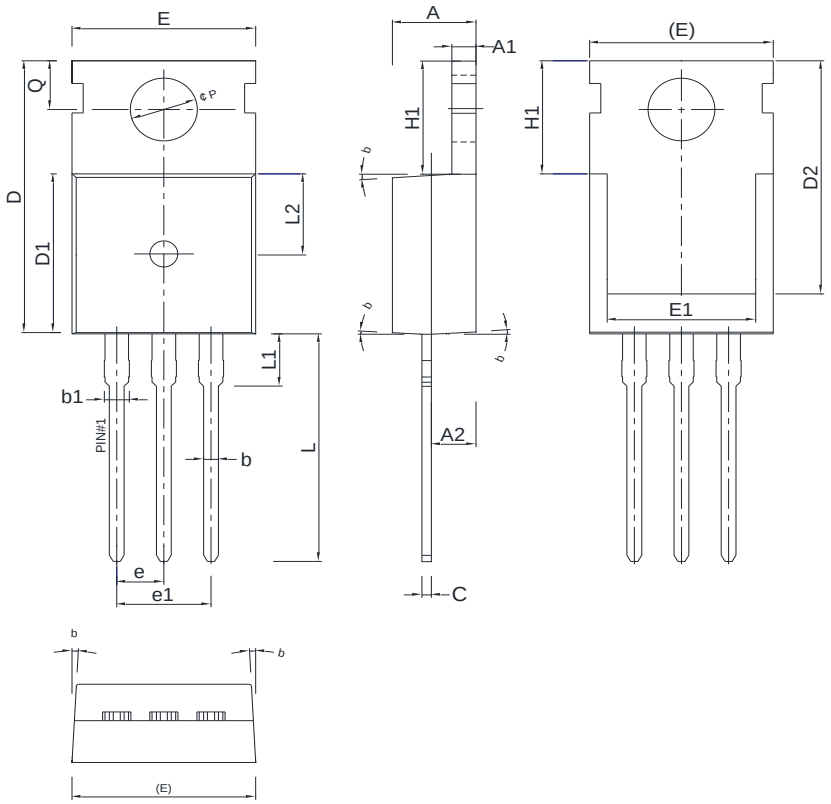


Figure C：Unclamped Inductive Switching Test Circuit and Waveform



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 Û	Û	Û