P-Channel Enhancement Mode Power MOSFET

Description

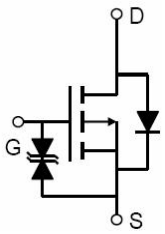
The G06P01E uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge. It can be used in a wide variety of applications.

General Features

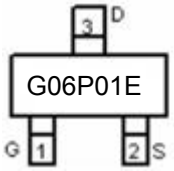
- V_{DS} -12V
- I_D (at V_{GS} = -10V) -4A
- $R_{DS(ON)}$ (at V_{GS} = - 4.5V) < 28mΩ
- $R_{DS(ON)}$ (at V_{GS} = - 3.7V) < 32mΩ
- $R_{DS(ON)}$ (at V_{GS} = - 2.5V) < 40mΩ
- $R_{DS(ON)}$ (at V_{GS} = - 1.8V) < 63mΩ
- 100% Avalanche Tested
- RoHS Compliant
- ESD (HBM)>2KV

Application

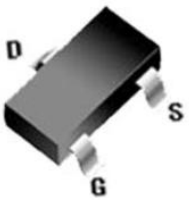
- Power switch
- DC/DC converters



Schematic diagram



Marking and pin assignment



SOT-23

Device	Package	Marking	Packaging
G06P01E	SOT-23	G06P01	3000pcs/Reel

Absolute Maximum Ratings T_C = 25ºC, unless otherwise noted

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	-12	V
Continuous Drain Current	I_D	-4	A
Pulsed Drain Current (note1)	I_{DM}	-16	A
Gate-Source Voltage	V_{GS}	±10	V
Power Dissipation	P_D	1.8	W
Operating Junction and Storage Temperature Range	T_J, T_{stg}	-55 To 150	ºC

Thermal Resistance

Parameter	Symbol	Value	Unit
Thermal Resistance, Junction-to-Ambient	R_{thJA}	70	ºC/W

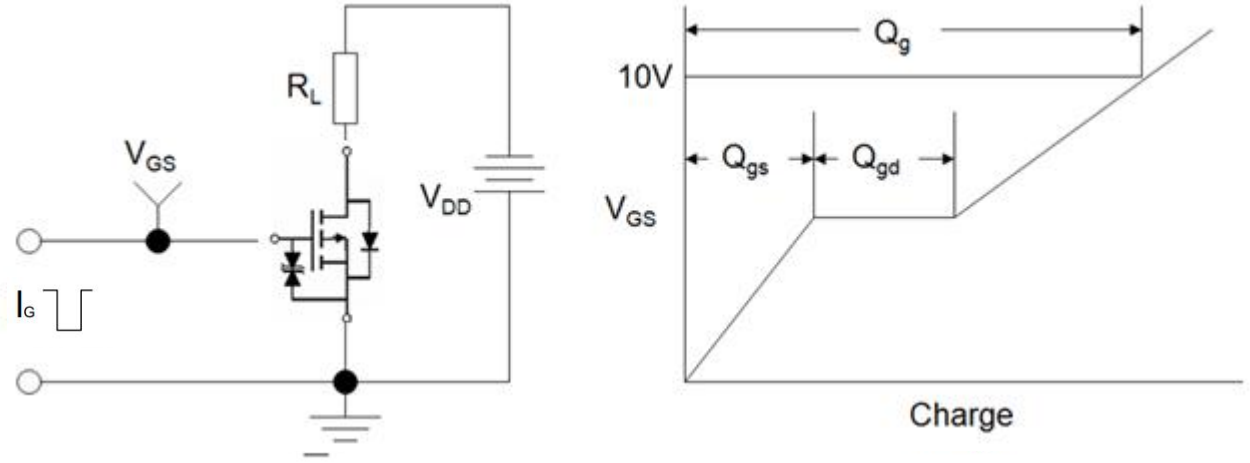
Specifications T_J = 25ºC, unless otherwise noted

Parameter	Symbol	Test Conditions	Value			Unit
			Min.	Typ.	Max.	
Static Parameters						
Drain-Source Breakdown Voltage	$V_{(BR)DSS}$	V_{GS} = 0V, I_D = -250μA	-12	--	--	V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS} = -12V, V_{GS} = 0V	--	--	-1	uA
Gate-Source Leakage	I_{GSS}	V_{GS} = ±10V	--	--	±10	uA
Gate-Source Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = -250μA	-0.4	-0.6	-1	V
Drain-Source On-Resistance	$R_{DS(on)}$	V_{GS} =-4.5V, I_D = -3A	--	23	28	mΩ
		V_{GS} =-3.7V, I_D = -2A	--	25	32	
		V_{GS} =-2.5V, I_D = -2A	--	30	40	
		V_{GS} = -1.8V, I_D = -1A	--	43	63	
Forward Transconductance	g_{FS}	V_{DS}=-5V,I_D=-3A	--	10.5	--	s
Dynamic Parameters						
Input Capacitance	C_{iss}	V_{GS} = 0V, V_{DS} = -6V, f = 1.0MHz	--	1087	--	pF
Output Capacitance	C_{oss}		--	267	--	
Reverse Transfer Capacitance	C_{rss}		--	253	--	
Total Gate Charge	Q_g	V_{DS} = -6V, I_D = -3A, V_{GS} = -4.5V	--	14	--	nC
Gate-Source Charge	Q_{gs}		--	2.3	--	
Gate-Drain Charge	Q_{gd}		--	3.6	--	
Turn-on Delay Time	$t_{d(on)}$	V_{DS} = -6V, I_D = -3A, R_G = 1Ω	--	26	--	ns
Turn-on Rise Time	t_r		--	24	--	
Turn-off Delay Time	$t_{d(off)}$		--	45	--	
Turn-off Fall Time	t_f		--	20	--	
Drain-Source Body Diode Characteristics						
Continuous Body Diode Current	I_S	T_C = 25ºC	--	--	-4	A
Body Diode Voltage	V_{SD}	T_J = 25ºC, I_{SD} = -3A, V_{GS} = 0V	--	--	-1.2	V

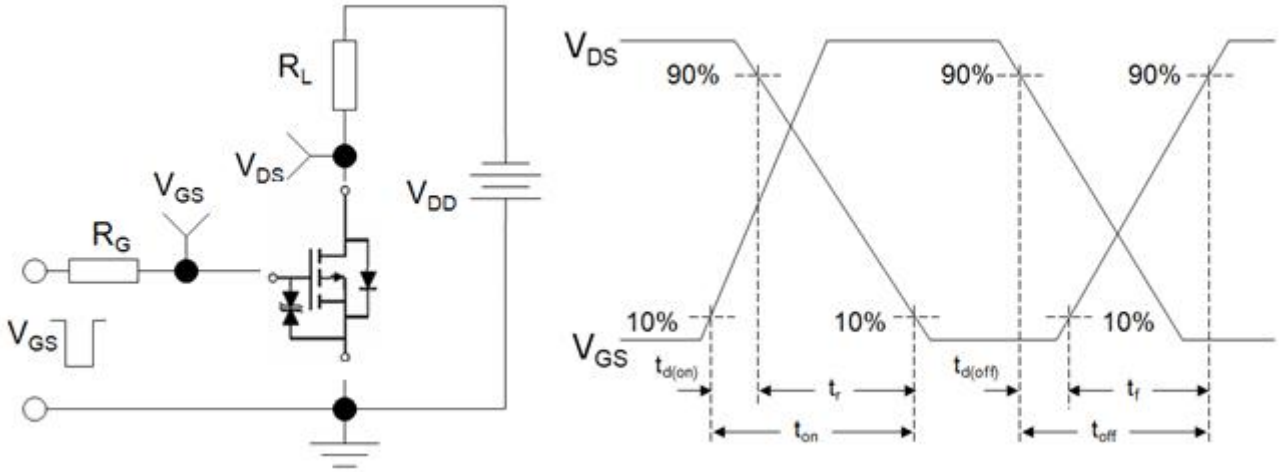
Notes

1. Repetitive Rating: Pulse width limited by maximum junction temperature
2. Identical low side and high side switch with identical R_G

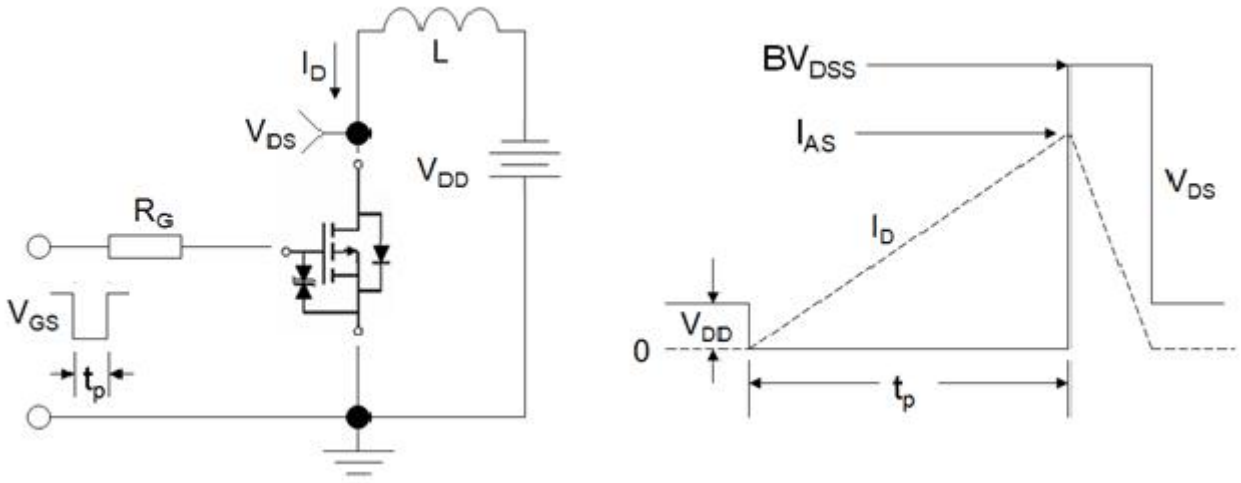
Gate Charge Test Circuit



Switch Time Test Circuit



EAS Test Circuit



Typical Characteristics T_J = 25ºC, unless otherwise noted

Figure 1. Output Characteristics

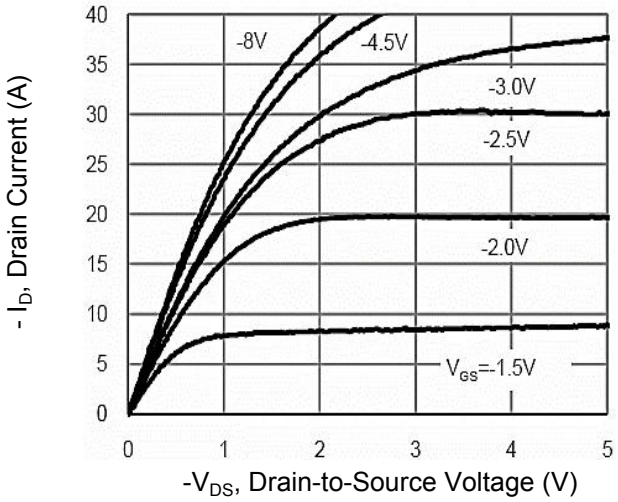


Figure 2. Transfer Characteristics

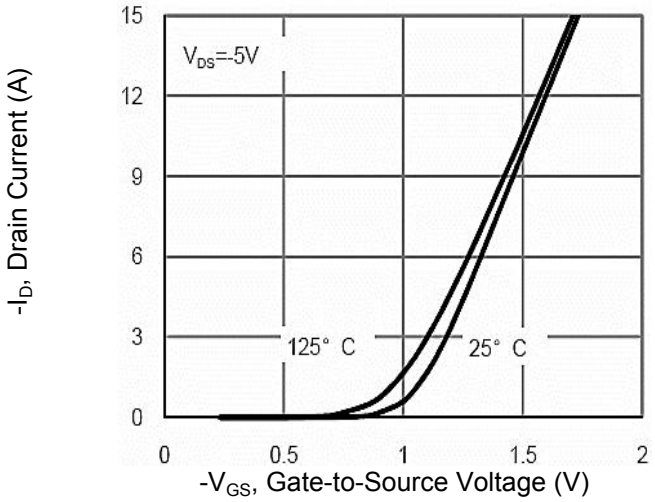


Figure 3. Gate Charge

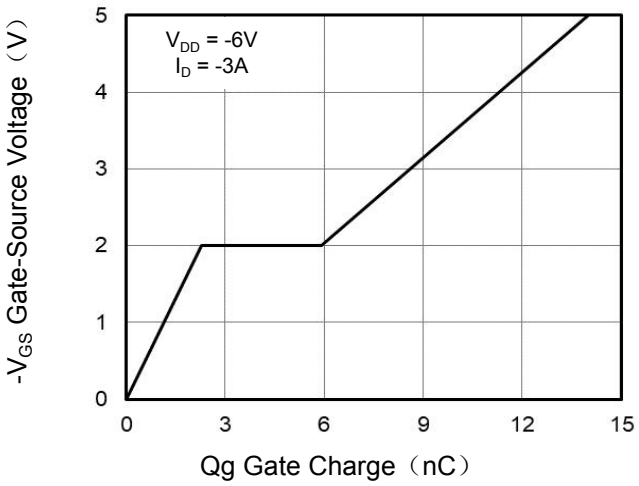


Figure 4. Drain Source On Resistance

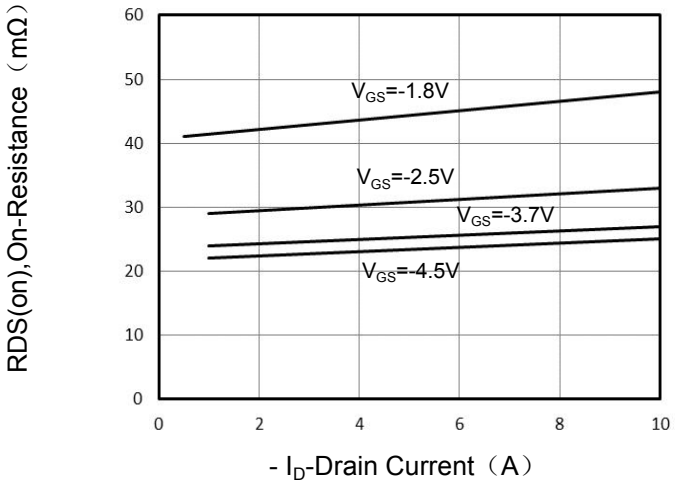


Figure 5. Capacitance

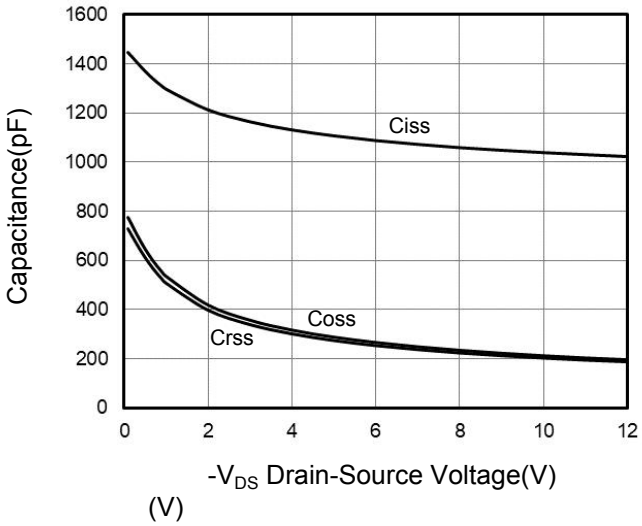
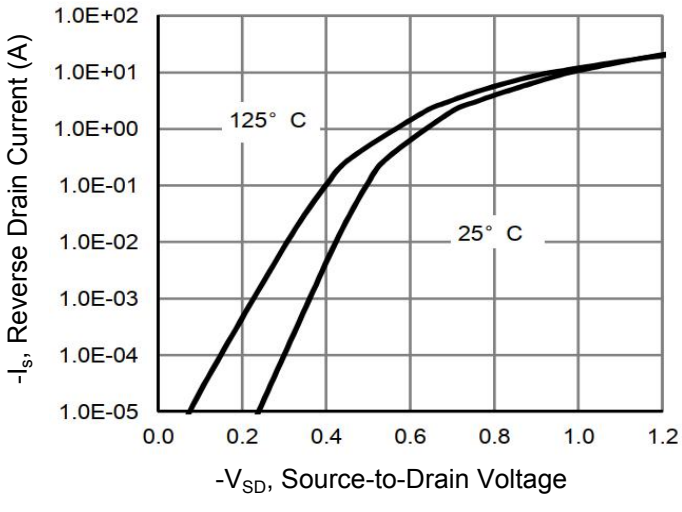


Figure 6. Source-Drain Diode Forward



Typical Characteristics T_J = 25ºC, unless otherwise noted

Figure 7. Drain-Source On-Resistance

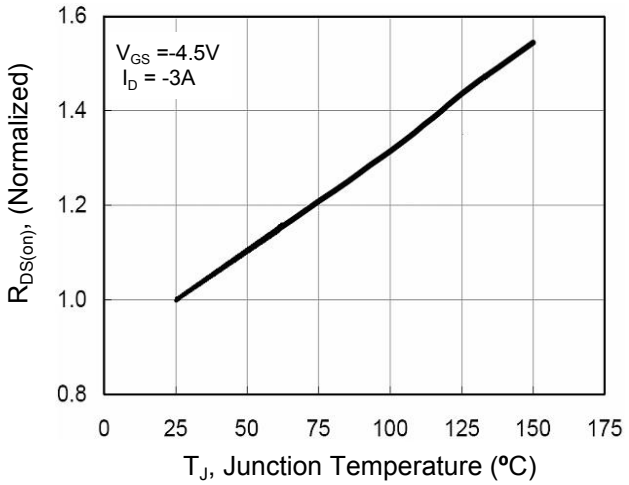


Figure 8. Safe Operation Area

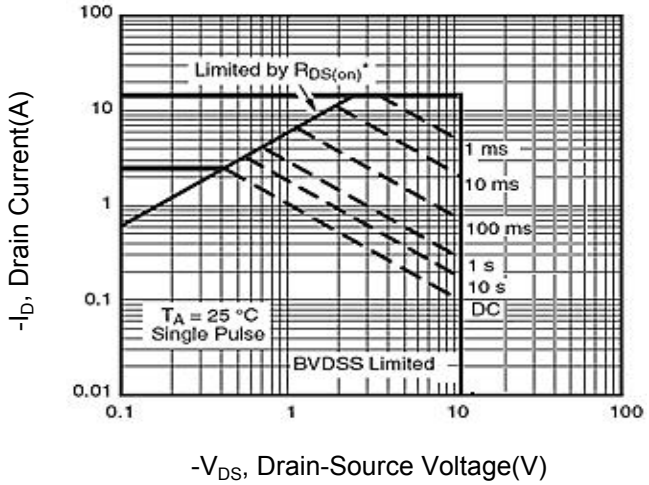
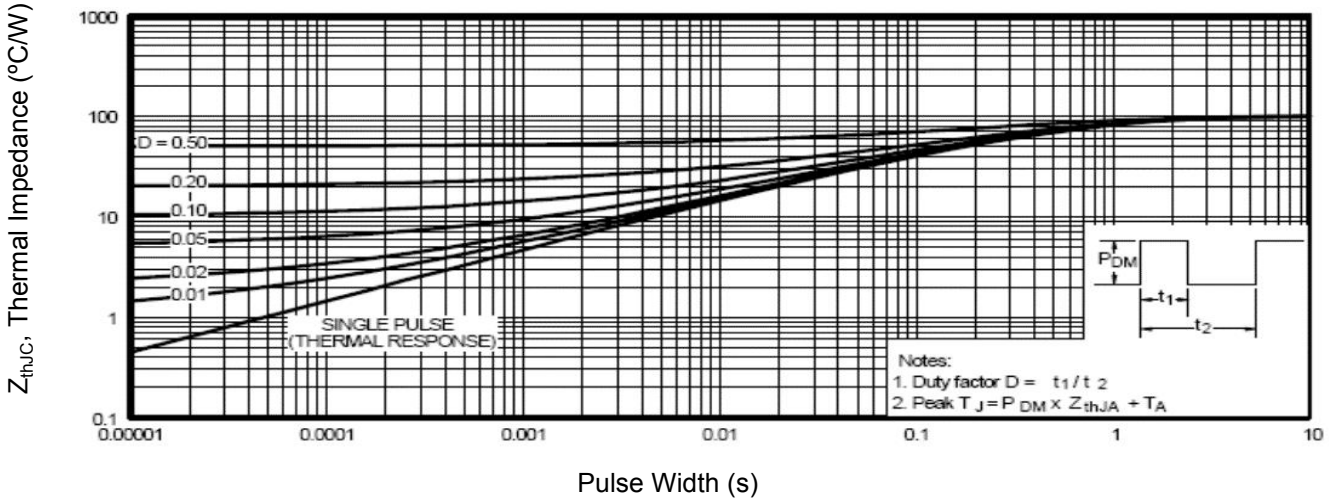
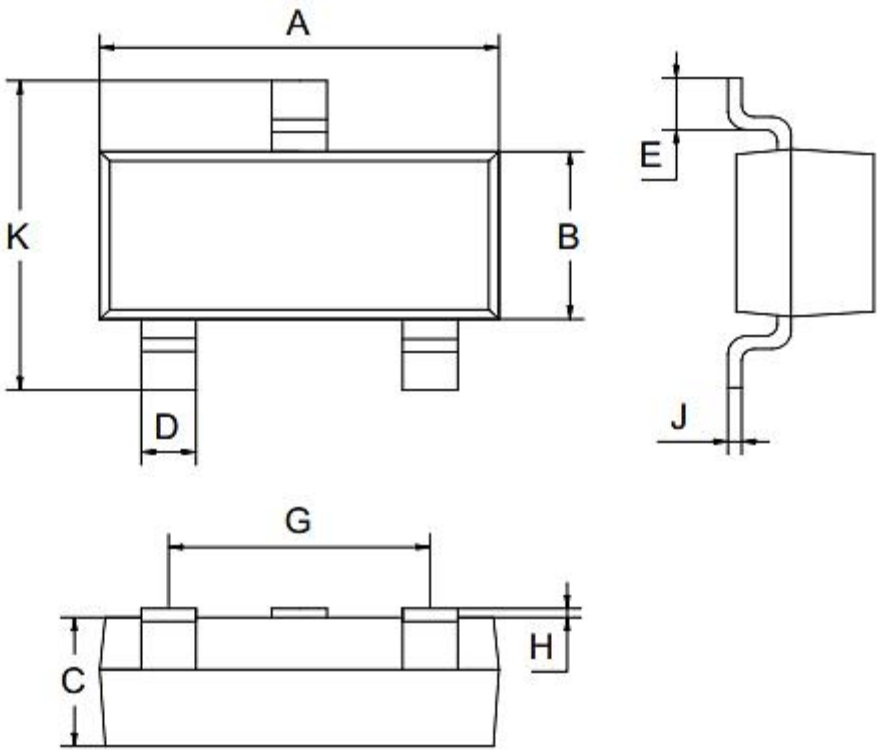


Figure 9. Normalized Maximum Transient Thermal Impedance



SOT-23 Package Information



SOT-23			
Dim	MIN	NOM	MAX
A	2.80	2.90	3.00
B	1.20	1.30	1.40
C	0.90	1.00	1.10
D	0.39	0.40	0.45
E	0.20MIN		
G	1.90REF		
H	0.00	-	0.10
J	0.05	0.10	0.15
K	2.30	2.40	2.50
All Dimensions in mm			

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