

P-Channel Enhancement Mode Power MOSFET

Description

The HM25P06K uses advanced trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge .This device is well suited for high current load applications.

General Features

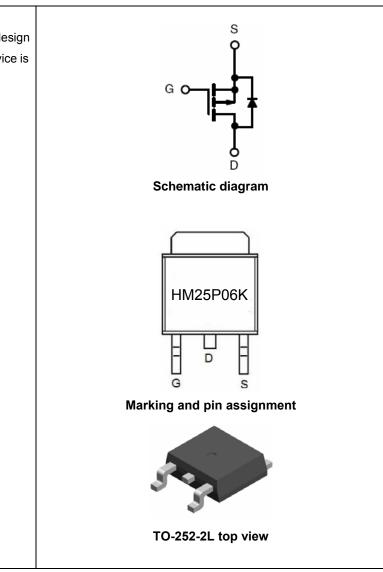
- V_{DS} =-60V,I_D =-25A
 R_{DS(ON)} <45mΩ @ V_{GS}=-10V
- High density cell design for ultra low Rdson
- Fully characterized avalanche voltage and current
- Good stability and uniformity with high E_{AS}
- Excellent package for good heat dissipation

Application

- High side switch for full bridge converter
- DC/DC converter for LCD display

100% UIS TESTED!

100% ΔVds TESTED!



Package Marking and Ordering Information

U	0				
Device Marking	Device	Device Package	Reel Size	Tape width	Quantity
HM25P06K	HM25P06K	TO-252-2L	-	-	-

Absolute Maximum Ratings (T_c=25[°]C unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	Vds	-60	V
Gate-Source Voltage	Vgs	±20	V
Drain Current-Continuous	Ι _D	-25	А
Drain Current-Continuous(T _C =100 ℃)	I _D (100℃)	-17.7	A
Pulsed Drain Current	I _{DM}	-60	A
Maximum Power Dissipation	PD	90	W
Derating factor		0.72	W/℃



Single pulse avalanche energy (Note 5)	E _{AS}	300	mJ
Operating Junction and Storage Temperature Range	T_J,T_STG	-55 To 150	°C

Thermal Characteristic

Thermal Resistance, Junction-to-Case ^(Note 2)	$R_{ ext{ hetaJC}}$	1.4	°C/W

Electrical Characteristics (T_c=25[°]C unless otherwise noted)

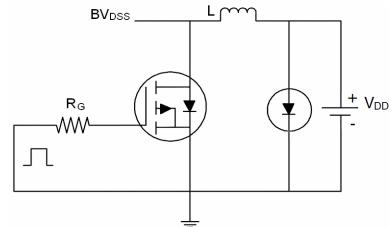
Parameter	Symbol	Condition	Min	Тур	Max	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V I _D =-250µA	-60	-	-	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =-60V,V _{GS} =0V	-	-	-1	μA
Gate-Body Leakage Current	I _{GSS}	V _{GS} =±20V,V _{DS} =0V	-	-	±100	nA
On Characteristics (Note 3)						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} =V _{GS} ,I _D =-250µA	-2	-2.9	-3.5	V
Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =-10V, I _D =-20A	-	39	45	mΩ
Forward Transconductance	g fs	V _{DS} =-10V,I _D =-10A	-	25	-	S
Dynamic Characteristics (Note4)		·	•			
Input Capacitance	C _{lss}	$y_{1} = 20y_{1}y_{1} = -0y_{1}$	-	3430	-	PF
Output Capacitance	C _{oss}	V _{DS} =-30V,V _{GS} =0V, F=1.0MHz	-	391	-	PF
Reverse Transfer Capacitance	C _{rss}		-	272	-	PF
Switching Characteristics (Note 4)		·	•			
Turn-on Delay Time	t _{d(on)}		-	12	-	nS
Turn-on Rise Time	tr	V_{DD} =-30V, R _L =1.5 Ω ,	-	15	-	nS
Turn-Off Delay Time	t _{d(off)}	V _{GS} =-10V,R _G =3Ω	-	38	-	nS
Turn-Off Fall Time	t _f		-	15	-	nS
Total Gate Charge	Qg	V - 20 L - 20 A	-	46		nC
Gate-Source Charge	Q _{gs}	V _{DS} =-30,I _D =-20A, V _{GS} =-10V	-	9.5		nC
Gate-Drain Charge	Q _{gd}	VGS10V	-	10.5		nC
Drain-Source Diode Characteristics						
Diode Forward Voltage (Note 3)	V _{SD}	V _{GS} =0V,I _S =-10A	-		-1.2	V
Diode Forward Current (Note 2)	I _S		-	-	-25	Α
Reverse Recovery Time	trr	TJ = 25°C, IF =- 10A	-	47		nS
Reverse Recovery Charge	Qrr	di/dt = -100A/µs(Note3) - 53			nC	
Forward Turn-On Time	t _{on}	Intrinsic turn-on time is negligible (turn-on is dominated by LS+LD)				

Notes:

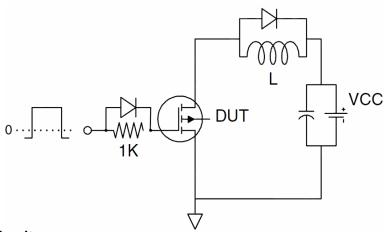
- 1. Repetitive Rating: Pulse width limited by maximum junction temperature.
- **2.** Surface Mounted on FR4 Board, t \leq 10 sec.
- **3.** Pulse Test: Pulse Width \leq 300µs, Duty Cycle \leq 2%.
- 4. Guaranteed by design, not subject to production
- **5.** E_{AS} condition: Tj=25 $^\circ C$,V_{DD}=-20V,V_G=-10V,L=1mH,Rg=25\Omega,I_{AS}=33A



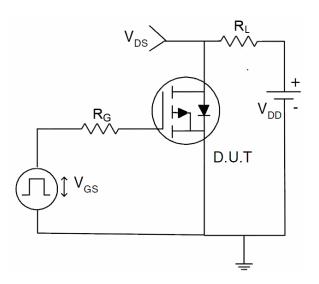
Test Circuit 1) E_{AS} Test Circuit



2) Gate Charge Test Circuit

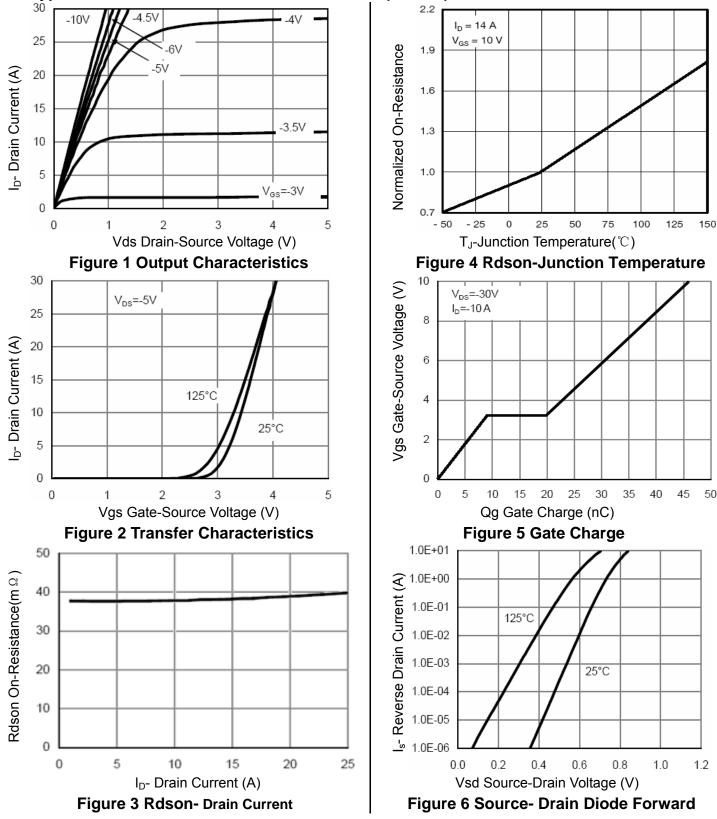


3) Switch Time Test Circuit











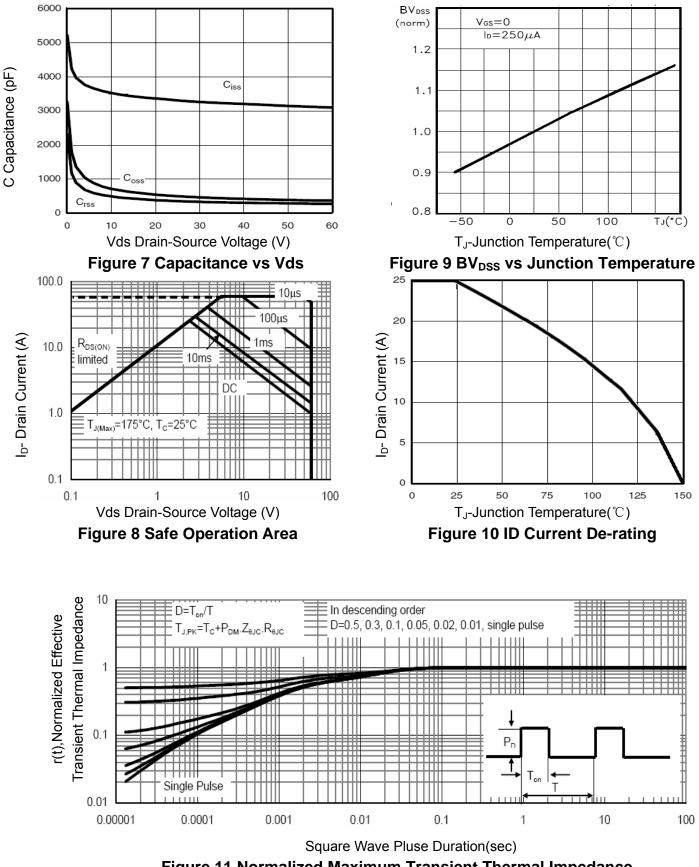
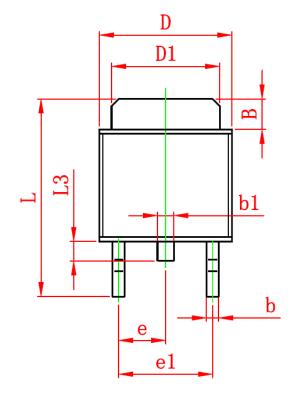
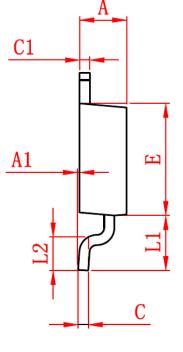


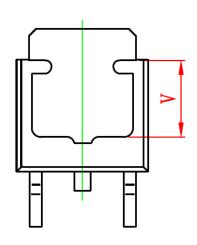
Figure 11 Normalized Maximum Transient Thermal Impedance



TO-252-2L PACKAGE OUTLINE DIMENSIONS







Symbol	Dimensions In Millimeters		Dimensions In Inches		
Symbol	Min.	Max.	Min.	Max.	
A	2.200	2.400	0.087	0.094	
A1	0.000	0.127	0.000	0.005	
В	1.350	1.650	0.053	0.065	
b	0.500	0.700	0.020	0.028	
b1	0.700	0.900	0.028	0.035	
С	0.430	0.580	0.017	0.023	
c1	0.430	0.580	0.017	0.023	
D	6.350	6.650	0.250	0.262	
D1	5.200	5.400	0.205	0.213	
E	5.400	5.700	0.213	0.224	
е	2.300	TYP.	0.091	TYP.	
e1	4.500	4.700	0.177	0.185	
L	9.500	9.900	0.374	0.390	
L1	2.550	2.900	0.100	0.114	
L2	1.400	1.780	0.055	0.070	
L3	0.600	0.900	0.024	0.035	
V	3.800	REF.	0.150	REF.	



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