HM25P06D-VB Datasheet

P-Channel 60 V (D-S) 175 °C MOSFET

PRODUCT SUMMARY	
V_{DS} (V)	-60
$R_{DS(on)}$ (Ω) at V_{GS} = -10 V	0.0210
$R_{DS(on)}$ (Ω) at V_{GS} = -4.5 V	0.0288
I_D (A)	-36
Configuration	Single
Package	DFN 5X6

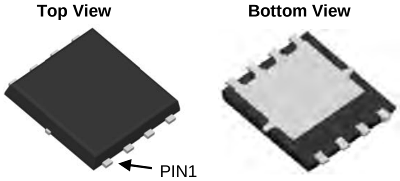
FEATURES

- Trench power MOSFET
- 100 % R_g and UIS tested

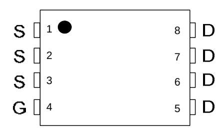
Pb-free
RoHS COMPLIANT
HALOGEN FREE

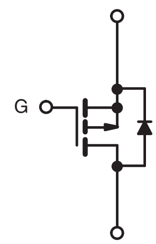
DFN5X6

Top View　　Bottom View



Top View





P-Channel MOSFET

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	
Continuous Drain Current	T_C = 25 °C	I_D	-36	A
	T_C = 125 °C		-21	
Continuous Source Current (Diode Conduction) [a]		I_S	-60	
Pulsed Drain Current [b]		I_{DM}	-100	
Single Pulse Avalanche Current	L = 0.1 mH	I_{AS}	-36	
Single Pulse Avalanche Energy		E_{AS}	64.8	mJ
Maximum Power Dissipation [b]	T_C = 25 °C	P_D	68	W
	T_C = 125 °C		22	
Operating Junction and Storage Temperature Range		T_J, T_{stg}	-55 to +175	°C
Soldering Recommendations (Peak Temperature) [d, e]			260	

THERMAL RESISTANCE RATINGS				
PARAMETER		SYMBOL	LIMIT	UNIT
Junction-to-Ambient	PCB Mount[c]	R_{thJA}	68	°C/W
Junction-to-Case (Drain)		R_{thJC}	2.2	

Notes

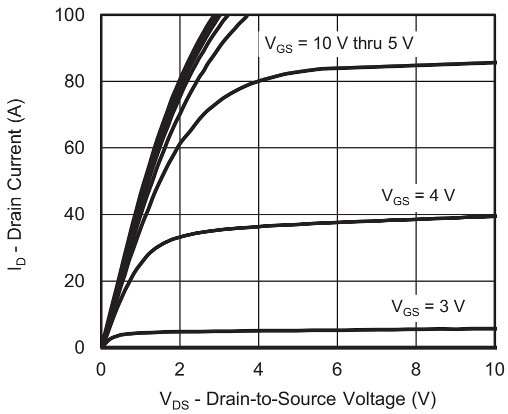
a. Package limited.
b. Pulse test; pulse width ≤ 300 μs, duty cycle ≤ 2 %.
c. When mounted on 1" square PCB (FR4 material).

SPECIFICATIONS (T_C = 25 °C, unless otherwise noted)							
PARAMETER	**SYMBOL**	**TEST CONDITIONS**		**MIN.**	**TYP.**	**MAX.**	**UNIT**
Static							
Drain-Source Breakdown Voltage	V_{DS}	V_{GS} = 0, I_D = -250 µA		-60	-	-	V
Gate-Source Threshold Voltage	$V_{GS(th)}$	V_{DS} = V_{GS}, I_D = -250 µA		-1.5	-2.0	-2.5	V
Gate-Source Leakage	I_{GSS}	V_{DS} = 0 V, V_{GS} = ± 20 V		-	-	± 100	nA
Zero Gate Voltage Drain Current	I_{DSS}	V_{GS} = 0 V	V_{DS} = -60 V	-	-	-1	µA
		V_{GS} = 0 V	V_{DS} = -60 V, T_J = 125 °C	-	-	-50	
		V_{GS} = 0 V	V_{DS} = -60 V, T_J = 175 °C	-	-	-150	
On-State Drain Current [a]	$I_{D(on)}$	V_{GS} = -10 V	V_{DS} ≥ -5 V	-30	-	-	A
Drain-Source On-State Resistance [a]	$R_{DS(on)}$	V_{GS} = -10 V	I_D = -10 A	-	0.0210	-	Ω
		V_{GS} = -10 V	I_D = -10 A, T_J = 125 °C	-	0.0409	-	
		V_{GS} = -10 V	I_D = -10 A, T_J = 175 °C	-	0.0504	-	
		V_{GS} = -4.5 V	I_D = -5 A	-	0.0288	-	
Forward Transconductance [b]	g_{fs}	V_{DS} = -15 V, I_D = -10 A		-	26	-	S
Dynamic [b]							
Input Capacitance	C_{iss}	V_{GS} = 0 V	V_{DS} = -25 V, f = 1 MHz	-	2600	3400	pF
Output Capacitance	C_{oss}			-	310	450	
Reverse Transfer Capacitance	C_{rss}			-	200	275	
Total Gate Charge [c]	Q_g	V_{GS} = -10 V	V_{DS} = -30 V, I_D = -5 A	-	65	100	nC
Gate-Source Charge [c]	Q_{gs}			-	9.5	-	
Gate-Drain Charge [c]	Q_{gd}			-	19	-	
Gate Resistance	R_g	f = 1 MHz		0.50	1.19	1.80	Ω
Turn-On Delay Time [c]	$t_{d(on)}$	V_{DD} = -30 V, R_L = 6 Ω I_D ≅ -5 A, V_{GEN} = -10 V, R_g = 1 Ω		-	15	25	ns
Rise Time [c]	t_r			-	5	10	
Turn-Off Delay Time [c]	$t_{d(off)}$			-	40	75	
Fall Time [c]	t_f			-	6	12	
Source-Drain Diode Ratings and Characteristics [b]							
Pulsed Current [a]	I_{SM}			-	-	-100	A
Forward Voltage	V_{SD}	I_F = -10 A, V_{GS} = 0 V		-	-0.80	-1.2	V

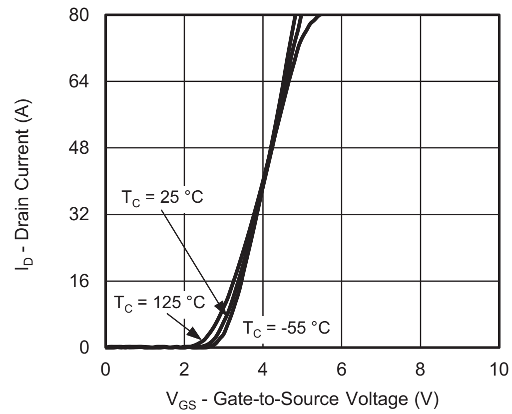
Notes

a. Pulse test; pulse width ≤ 300 µs, duty cycle ≤ 2 %.
b. Guaranteed by design, not subject to production testing.
c. Independent of operating temperature.

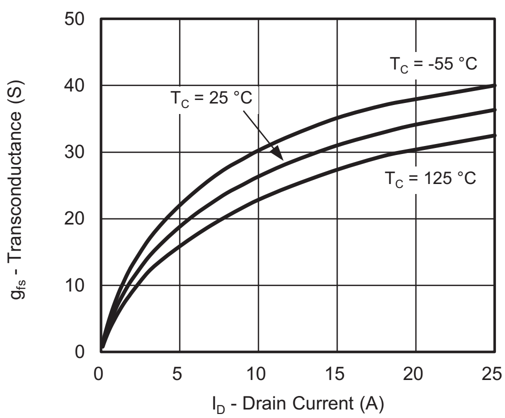
TYPICAL CHARACTERISTICS (T_A = 25 °C, unless otherwise noted)



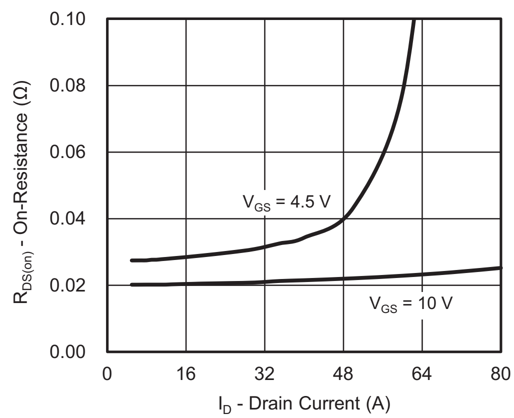
Output Characteristics



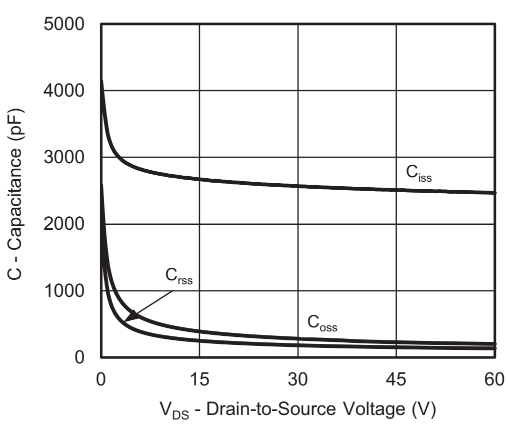
Transfer Characteristics



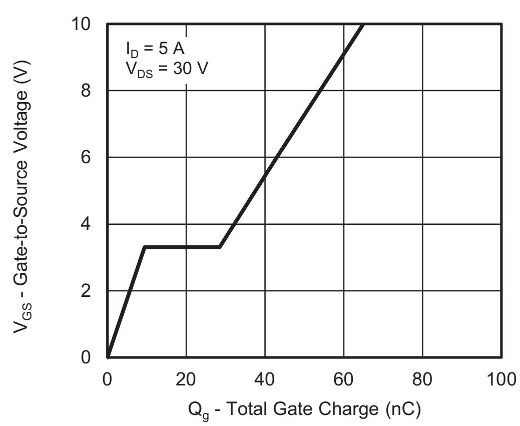
Transconductance



On-Resistance vs. Drain Current

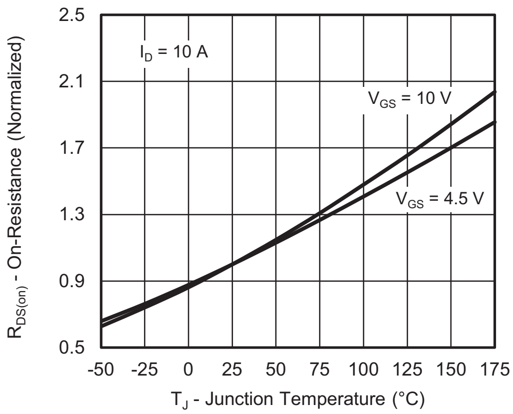


Capacitance

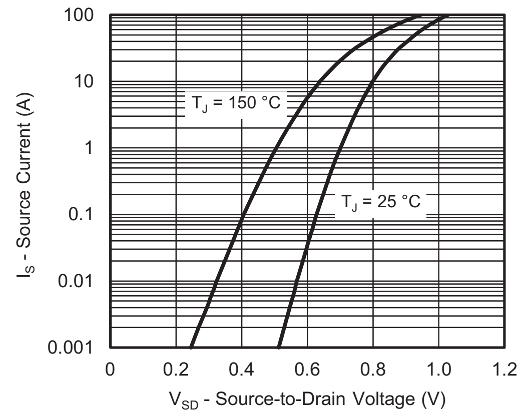


Gate Charge

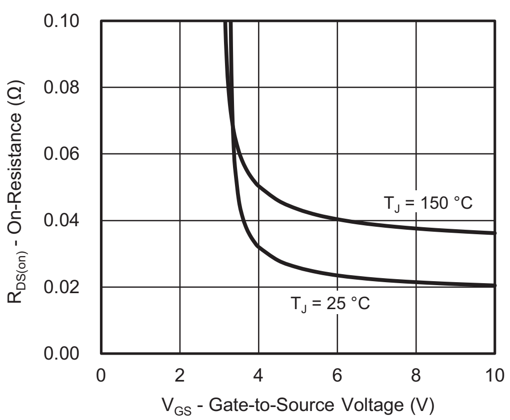
TYPICAL CHARACTERISTICS (T_A = 25 °C, unless otherwise noted)



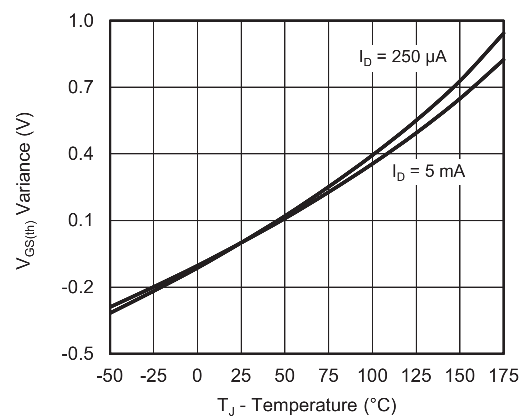
On-Resistance vs. Junction Temperature



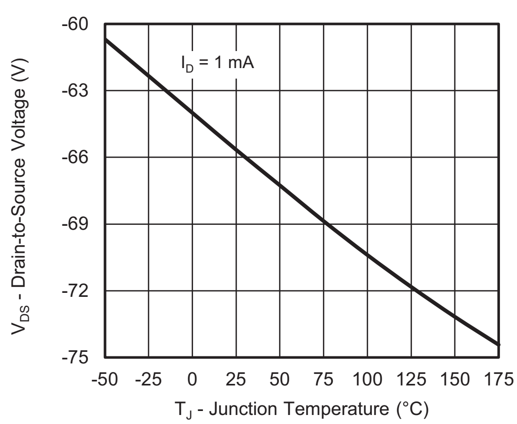
Source Drain Diode Forward Voltage



On-Resistance vs. Gate-to-Source Voltage

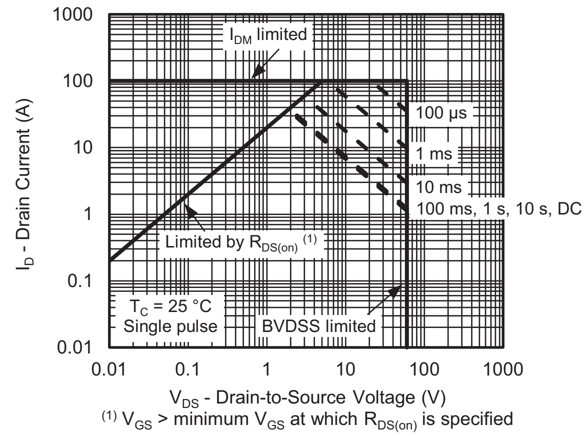


Threshold Voltage

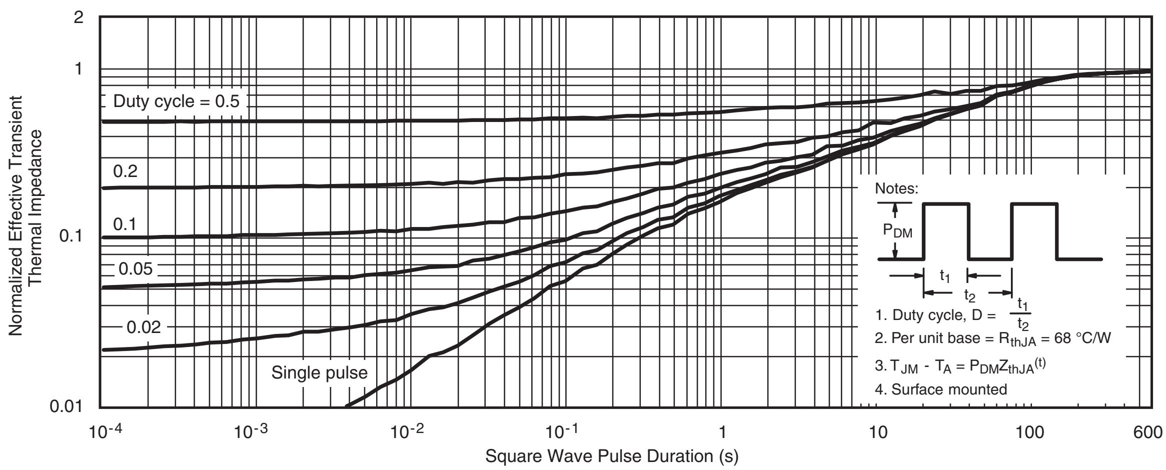


Drain-Source Breakdown vs. Junction Temperature

THERMAL RATINGS (T_C = 25 °C, unless otherwise noted)

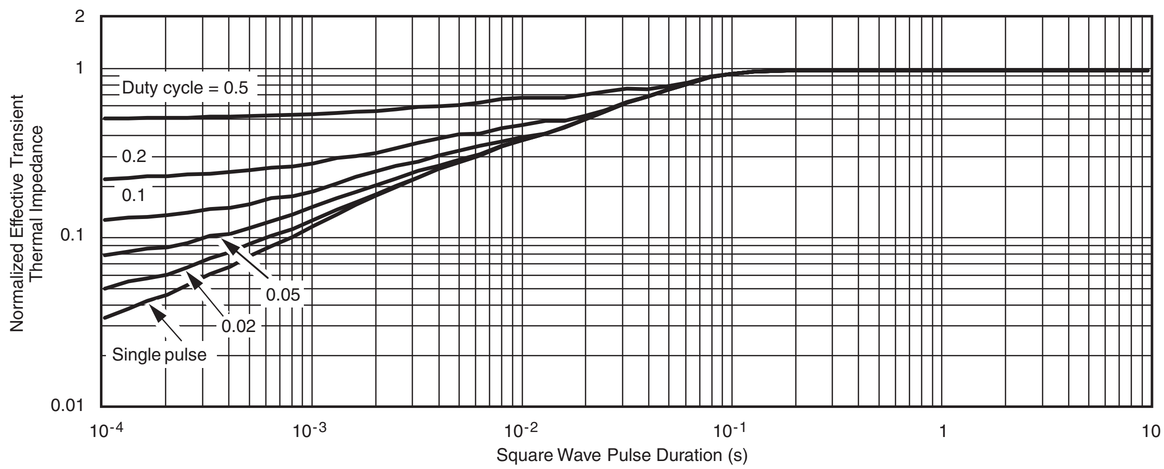


Safe Operating Area



Normalized Thermal Transient Impedance, Junction-to-Ambient

THERMAL RATINGS (T_C = 25 °C, unless otherwise noted)



Normalized Thermal Transient Impedance, Junction-to-Case

Note

- The characteristics shown in the two graphs
  - Normalized Transient Thermal Impedance Junction-to-Ambient (25 °C)
  - Normalized Transient Thermal Impedance Junction-to-Case (25 °C)

  are given for general guidelines only to enable the user to get a "ball park" indication of part capabilities. The data are extracted from single pulse transient thermal impedance characteristics which are developed from empirical measurements. The latter is valid for the part mounted on printed circuit board - FR4, size 1" x 1" x 0.062", double sided with 2 oz. copper, 100 % on both sides. The part capabilities can widely vary depending on actual application parameters and operating conditions.

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