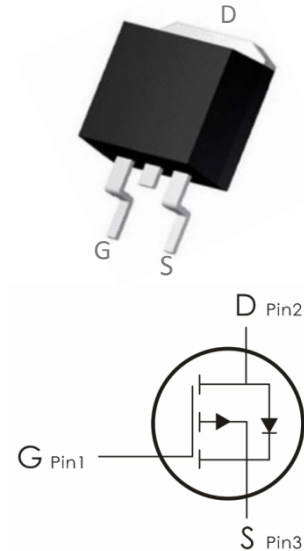


Description:

This P-Channel MOSFET uses advanced trench technology and design to provide excellent $R_{DS(on)}$ with low gate charge. It can be used in a wide variety of applications.

Features:

- 1) $V_{DS}=-40V, I_D=-90A, R_{DS(ON)}<5.8m\Omega @V_{GS}=-10V$
- 2) Low gate charge.
- 3) Green device available.
- 4) Advanced high cell density trench technology for ultra $R_{DS(ON)}$.
- 5) Excellent package for good heat dissipation.



Absolute Maximum Ratings: ($T_C=25^\circ C$ unless otherwise noted)

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	-40	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Continuous Drain Current-TC=25°C	-90	A
	Continuous Drain Current-TC=100°C	-57	
	Pulsed Drain Current ¹	-360	
E_{AS}	Single Pulse Avalanche Energy	174	mJ
P_D	Power Dissipation(TC=25°C)	101	W
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +150	°C

Thermal Characteristics:

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Thermal Resistance,Junction to Case	1.23	°C/W
$R_{\theta JA}$	Thermal Resistance,Junction to Ambient	62	

Package Marking and Ordering Information:

Part NO.	Marking	Package
BD006PG	D006P	TO-263

Electrical Characteristics: ($T_C=25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\ \mu\text{A}$	-40	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{DS}=-40V, V_{GS}=0V, T_J=25^\circ\text{C}$	---	---	-1	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0A$	---	---	± 100	nA
On Characteristics						
$V_{GS(th)}$	GATE-Source Threshold Voltage	$V_{GS}=V_{DS}, I_D=-250\ \mu\text{A}$	-1.2	-1.6	-2.5	V
$R_{DS(on)}$	Drain-Source On Resistance	$V_{GS}=-10V, I_D=-25A$	---	4.7	5.8	m Ω
		$V_{GS}=-4.5V, I_D=-15A$	---	6.4	8.3	
Dynamic Characteristics						
C_{iss}	Input Capacitance	$V_{DS}=-20V, V_{GS}=0V, f=1\text{MHz}$	---	6100	9100	pF
C_{oss}	Output Capacitance		---	600	900	
C_{rss}	Reverse Transfer Capacitance		---	540	810	
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time ^{2,3}	$V_{DD}=-20V, V_{GS}=-10V,$ $R_G=6\ \Omega, I_D=-45A$	---	41.6	82	ns
t_r	Rise Time ^{2,3}		---	12.7	26	ns
$t_{d(off)}$	Turn-Off Delay Time ^{2,3}		---	308	600	ns
t_f	Fall Time ^{3,3}		---	70	140	ns
Q_g	Total Gate Charge ^{2,3}	$V_{GS}=-10\text{V}, V_{DS}=-20V,$ $I_D=-45A$	---	115	160	nC
Q_{gs}	Gate-Source Charge ^{2,3}		---	16	25	nC
Q_{gd}	Gate-Drain "Miller" Charge ^{2,3}		---	25	40	nC
Drain-Source Diode Characteristics						
V_{SD}	Source-Drain Diode Forward Voltage	$V_{GS}=0V, I_S=-1A, T_J=25^\circ\text{C}$	---	---	-1	V

Notes:

1. Repetitive Rating : Pulsed width limited by maximum junction temperature.
2. The data tested by pulsed , pulse width \cong 300us , duty cycle \cong 2%.
3. Essentially independent of operating temperature.

Typical Characteristics: ($T_c=25^\circ\text{C}$ unless otherwise noted)

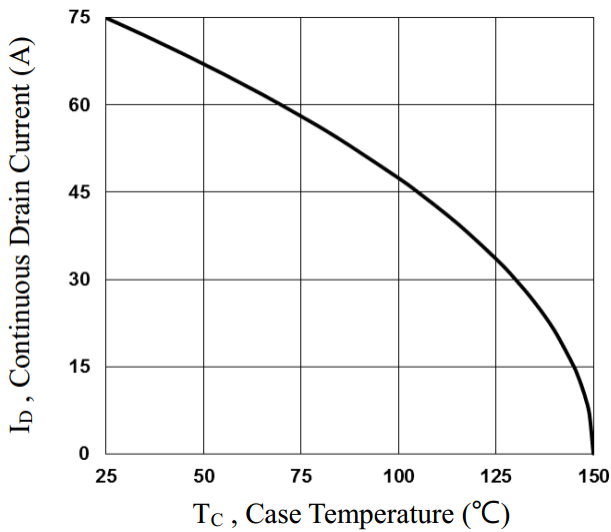


Fig.1 Continuous Drain Current vs. T_c

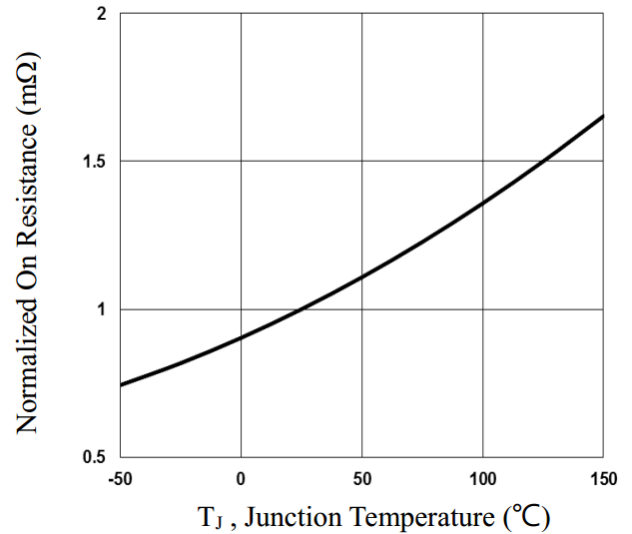


Fig.2 Normalized RDSON vs. T_J

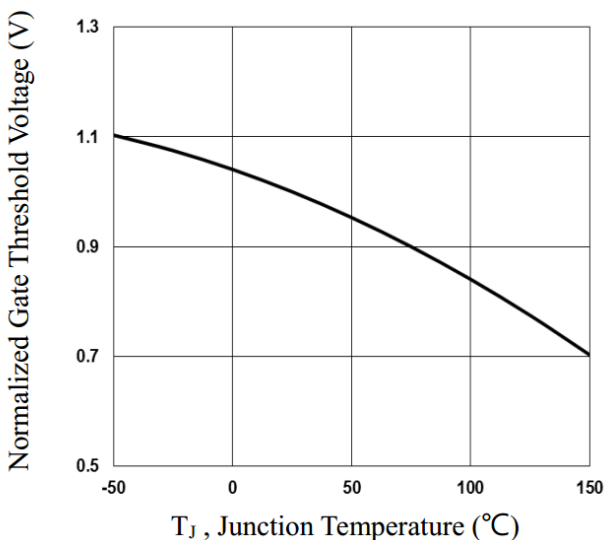


Fig.3 Normalized V_{th} vs. T_J

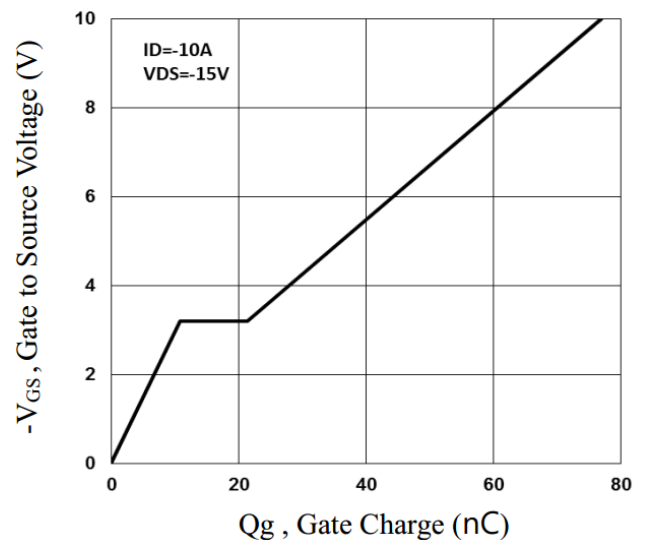


Fig.4 Gate Charge Waveform

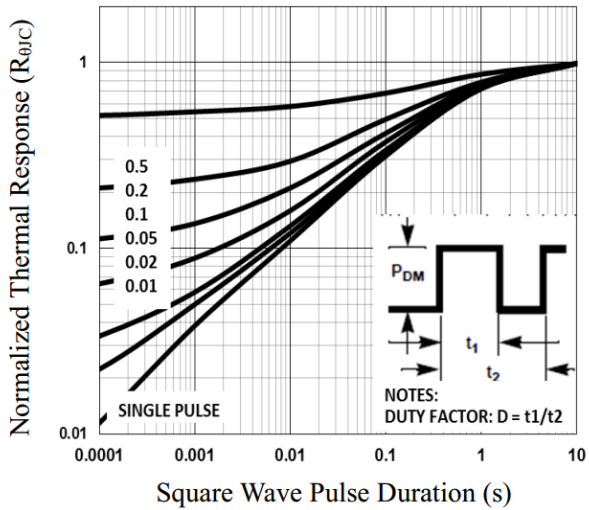


Fig.5 Normalized Transient Impedance

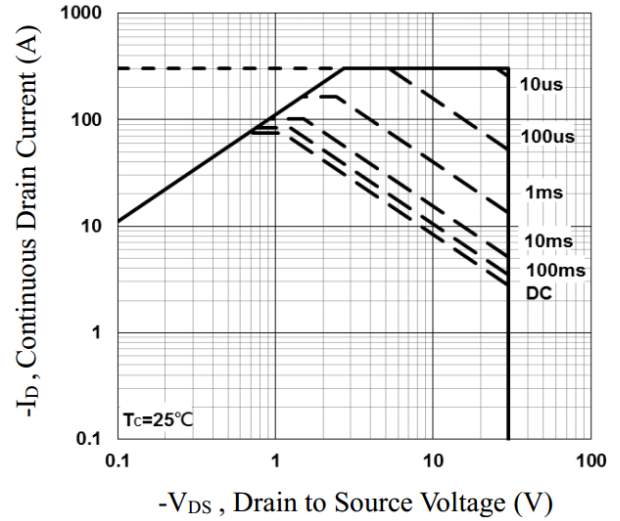


Fig.6 Maximum Safe Operation Area

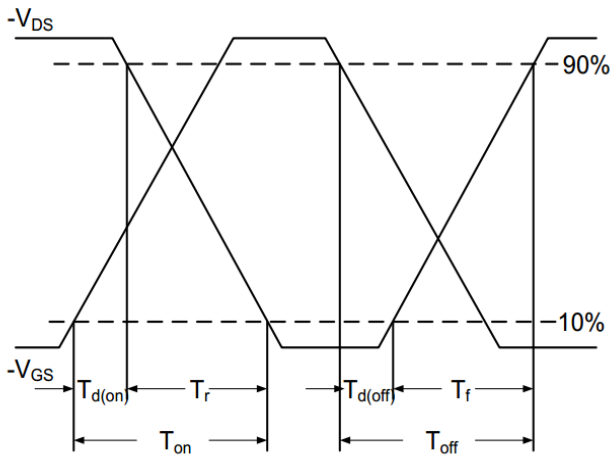


Fig.7 Switching Time Waveform

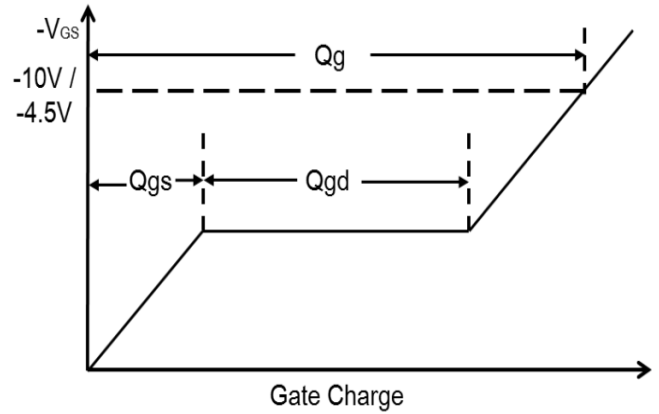


Fig.8 Gate Charge Waveform