

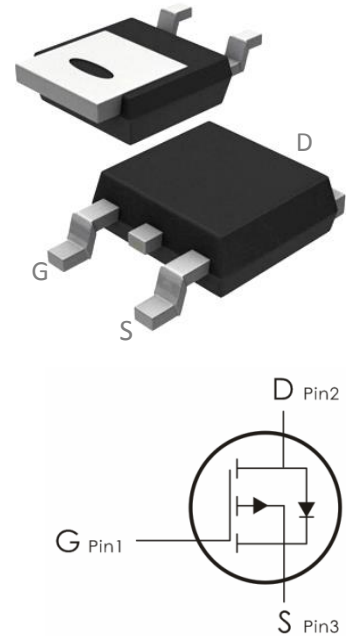
Description:

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) $V_{DS}=-30V, I_D=-70A, R_{DS(on)} < 10\text{ m}\Omega @ V_{GS}=-10V$
- 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: ($T_C=25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	-30	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Continuous Drain Current	-70	A
	Continuous Drain Current- $T_C=100^\circ\text{C}$	-44	
	Pulsed Drain Current ¹	-280	
E_{AS}	Single Pulse Avalanche Energy	---	mJ
P_D	Power Dissipation	73.5	W
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +150	$^\circ\text{C}$

Thermal Characteristics:

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Thermal Resistance, Junction to Case	1.7	$^\circ\text{C}/\text{W}$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient	62	

Package Marking and Ordering Information:

Part NO.	Marking	Package
IPD042P03L3 G-DO	042P03L	TO-252

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 μ A	-30	---	---	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{GS} =0V, V _{DS} =-30V	---	---	-1	μ A
I _{GSS}	Gate-Source Leakage Current	V _{GS} =± 20V, V _{DS} =0A	---	---	± 100	nA
On Characteristics						
V _{GS(th)}	GATE-Source Threshold Voltage	V _{GS} =V _{DS} , I _D =250 μ A	-1.2	-1.6	-2.5	V
R _{DS(ON)}	Drain-Source On Resistance	V _{GS} =-10V, I _D =-10A	---	7.1	10	m Ω
		V _{GS} =-4.5V, I _D =-8A	---	11.5	14	
G _{FS}	Forward Transconductance	V _{DS} =-10V, I _D =-10A	---	14	---	S
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =-15V, V _{GS} =0V, f=1MHz	---	3300	4800	pF
C _{oss}	Output Capacitance		---	410	700	
C _{rss}	Reverse Transfer Capacitance		---	280	500	
Switching Characteristics						
t _{d(on)}	Turn-On Delay Time	V _{DD} =-15V, I _D =-1A, R _{GEN} =6 Ω , V _{GS} =-10V	---	24.5	38	ns
t _r	Rise Time		---	10.5	16	ns
t _{d(off)}	Turn-Off Delay Time		---	156.8	230	ns
t _f	Fall Time		---	50	75	ns
Q _g	Total Gate Charge	V _{GS} =-4.5V, V _{DS} =-15V, I _D =-10A	---	35	56	nC
Q _{gs}	Gate-Source Charge		---	10.8	16	nC
Q _{gd}	Gate-Drain “Miller” Charge		---	10.6	16	nC
Drain-Source Diode Characteristics						
V _{SD}	Source-Drain Diode Forward Voltage ²	V _{GS} =0V, I _S =-1A, T _J =25℃	---	---	-1	V

Is	Diode Forward Current(Note 2)	$V_G=V_D=0V$, Force Current	---	---	-70	A
Lsm	Pulsed Source Current	$V_{GS}=0V$, $I_S=-1A$, $T_J=25^\circ C$	---	---	-140	Nc

Notes:

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

Typical Characteristics: ($T_C=25^\circ C$ unless otherwise noted)

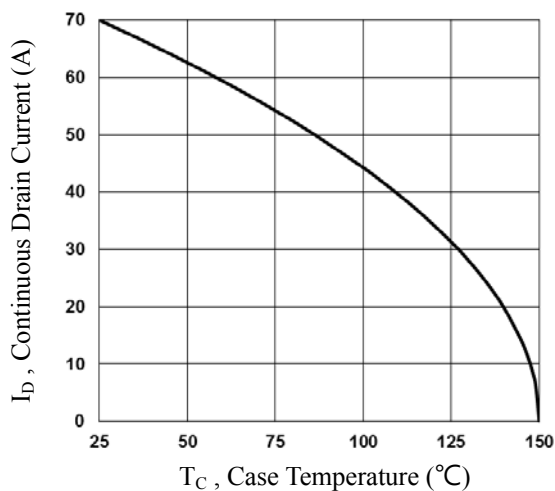


Fig.1 Continuous Drain Current vs. T_C

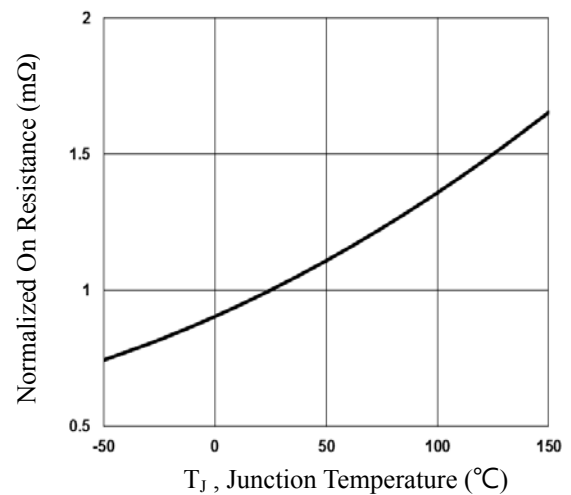


Fig.2 Normalized $R_{DS(on)}$ vs. T_J

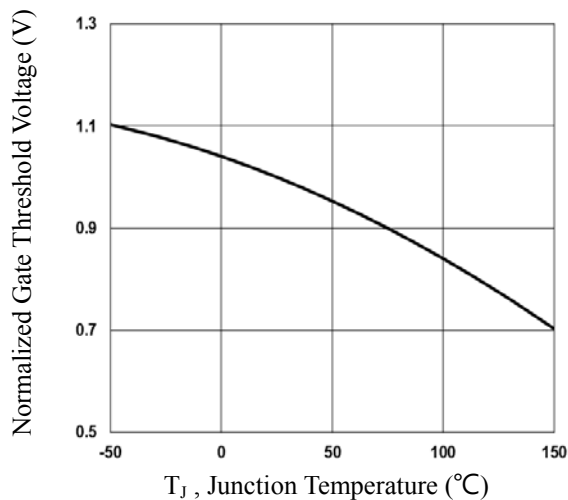


Fig.3 Normalized V_{th} vs. T_J

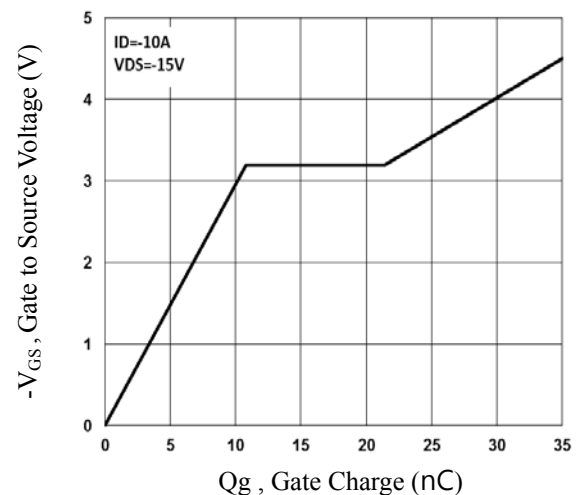


Fig.4 Gate Charge Waveform

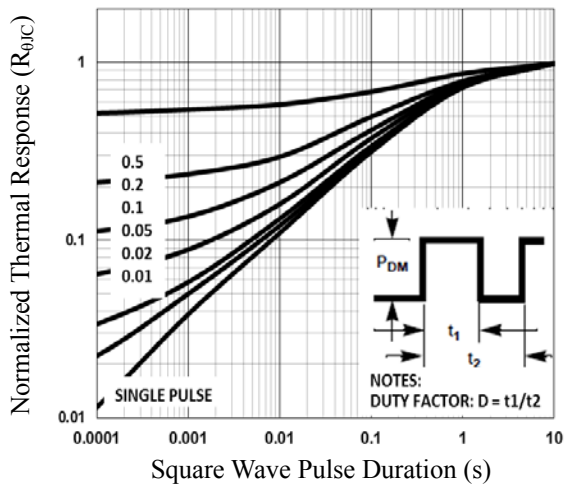


Fig.5 Normalized Transient Impedance

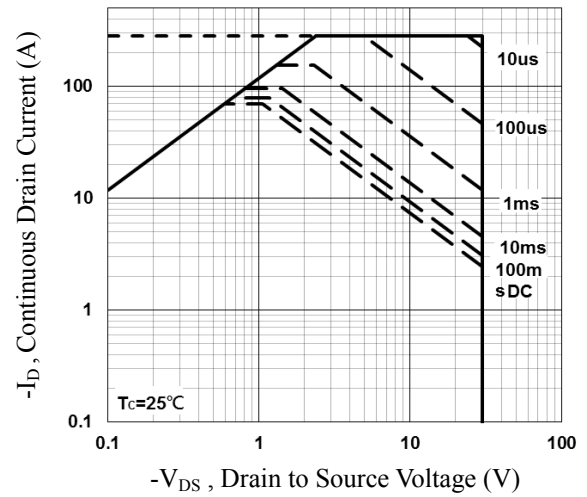


Fig.6 Maximum Safe Operation Area

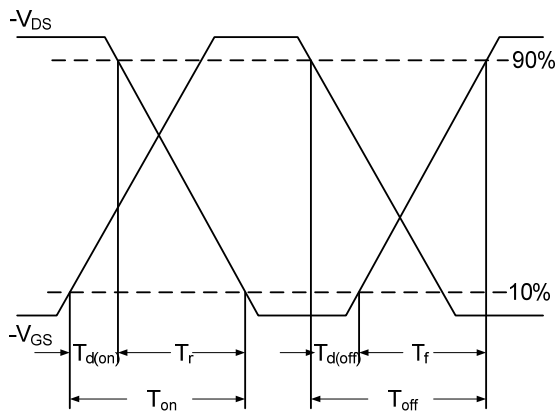


Fig.7 Switching Time Waveform

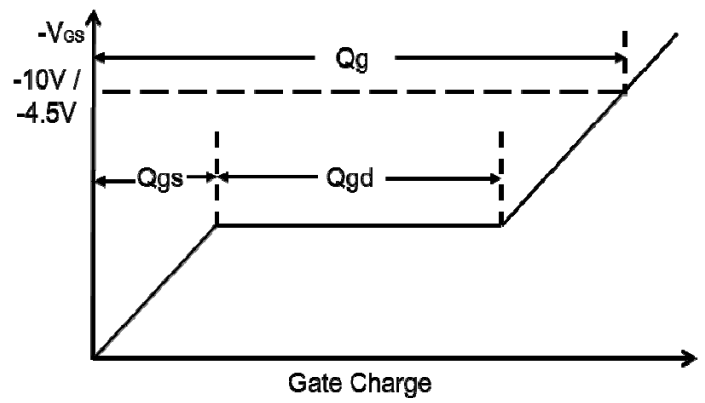


Fig.8 Gate Charge Waveform