General Description

The G15P04 uses advanced trench technology to provide excellent $R_{DS(ON)}$, low gate charge and operation with gate voltages as low as -4.5V. This device is suitable for use as a wide variety of applications.

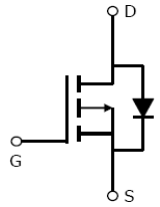
Features

V_{DSS}	$R_{DS(ON)}$ @-4.5V(Typ)	$R_{DS(ON)}$ @-10V(Typ)	I_D
-40V	50mΩ	28mΩ	-15A

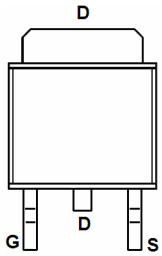
- High Power and current handing capability
- Lead free product is acquired
- Surface Mount Package

Application

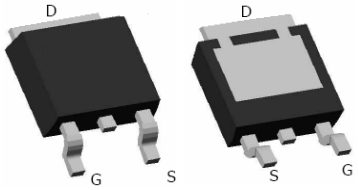
- PWM applications
- Load switch
- Power management



Schematic Diagram



Marking and pin Assignment



TO-252

Table 1. Absolute Maximum Ratings (T_A=25℃)

Symbol	Parameter	Value	Unit
V_{DS}	Drain-Source Voltage (V_{GS}=0V)	-40	V
V_{GS}	Gate-Source Voltage (V_{DS}=0V)	±20	V
I_D	Drain Current-Continuous(T_C=25℃)	-15	A
	Drain Current-Continuous(T_C=100℃)	-12	A
$I_{DM\ (pluse)}$	Drain Current-Continuous@ Current-Pulsed (Note 1)	-35	A
P_D	Maximum Power Dissipation(T_C=25℃)	40	W
	Maximum Power Dissipation(T_C=100℃)	20	W
T_J,T_{STG}	Operating Junction and Storage Temperature Range	-55 To 175	℃

Table 2. Thermal Characteristic

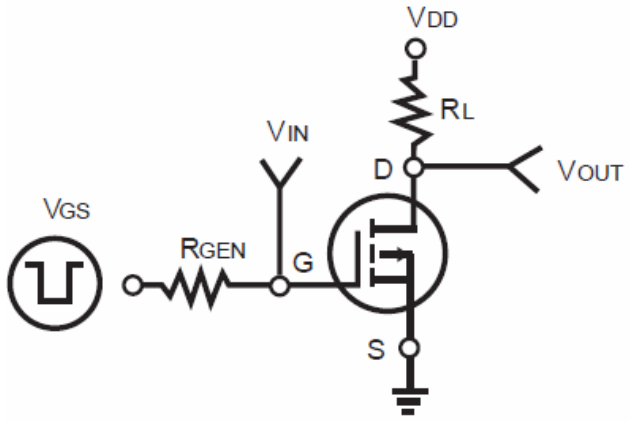
Symbol	Parameter	Value	Unit
$R_{\theta JC}$	Thermal Resistance,Junction-to-Case	3.75	℃/W

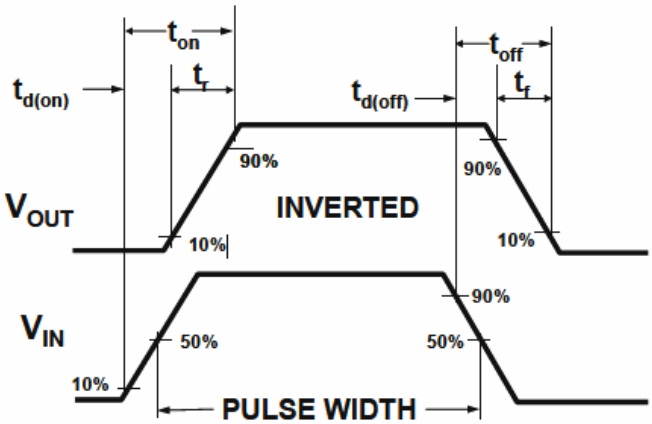
Table 3. Electrical Characteristics (TA=25℃unless otherwise noted)

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
On/Off States						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V I_D=-250μA	-40	-43		V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=-32V,V_{GS}=0V			-1	μA
I_{GSS}	Gate-Body Leakage Current	V_{GS}=±20V,V_{DS}=0V			±100	nA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS},I_D=-250μA	-1	-2	-3	V
g_{FS}	Forward Transconductance	V_{DS}=-5V,I_D=-10A		25		S
$R_{DS(ON)}$	Drain-Source On-State Resistance	V_{GS}=-10V, I_D=-15A		28	39	mΩ
		V_{GS}=-4.5V, I_D=-10A		50	70	mΩ
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}=-25V,V_{GS}=0V, f=1.0MHz		840		pF
C_{oss}	Output Capacitance			92		pF
C_{rss}	Reverse Transfer Capacitance			60		pF
Switching Times						
$t_{d(on)}$	Turn-on Delay Time	V_{GS}=-10V, V_{DS}=-20V, R_L=1.6Ω,R_{GEN}=3Ω		6		nS
t_r	Turn-on Rise Time			9		nS
$t_{d(off)}$	Turn-Off Delay Time			45		nS
t_f	Turn-Off Fall Time			41		nS
Q_g	Total Gate Charge	V_{GS}=-10V, V_{DS}=-20V, I_D=-15A		16		nC
Q_{gs}	Gate-Source Charge			3.8		nC
Q_{gd}	Gate-Drain Charge			3.5		nC
Source-Drain Diode Characteristics						
I_{SD}	Source-Drain Current(Body Diode)				-15	A
V_{SD}	Forward on Voltage	V_{GS}=0V,I_S=-15A			-1.2	V

Notes 1.Repetitive Rating: Pulse width limited by maximum junction temperature

Switch Time Test Circuit and Switching Waveforms:





TYPICAL ELECTRICAL AND THERMAL CHARACTERISTICS (Curves)

Figure1. Power Dissipation

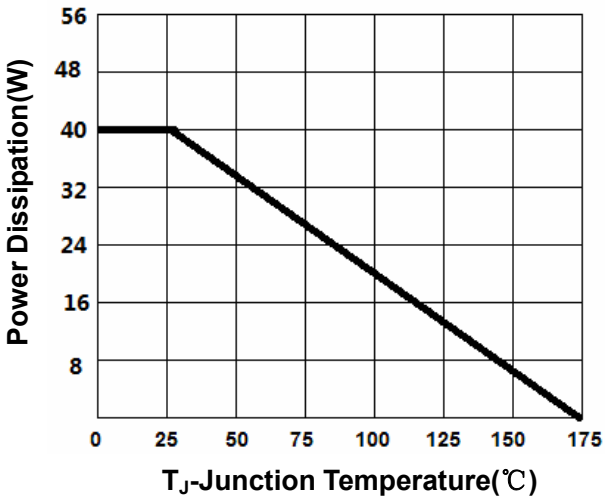


Figure2. Drain Current

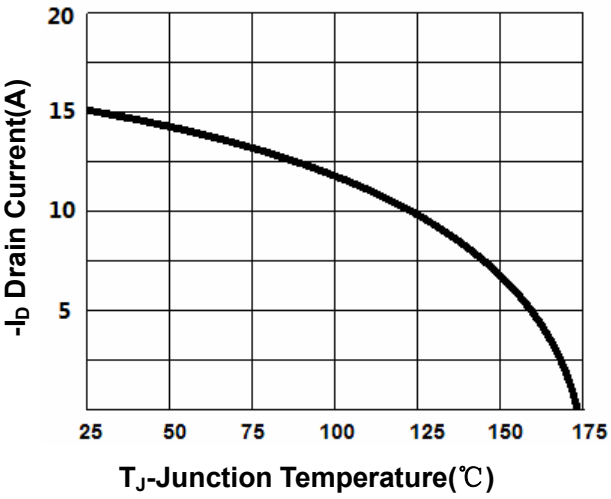


Figure3. Output Characteristics

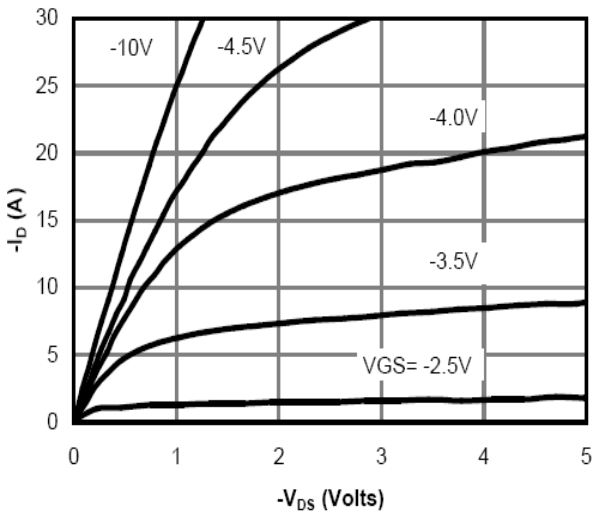


Figure4. Transfer Characteristics

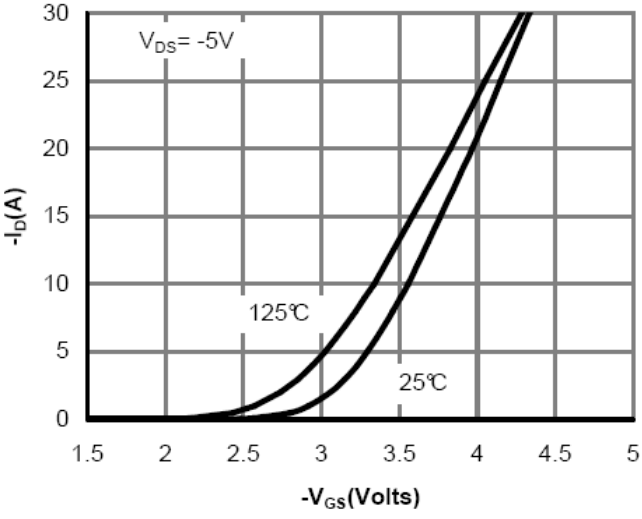


Figure5. Capacitance

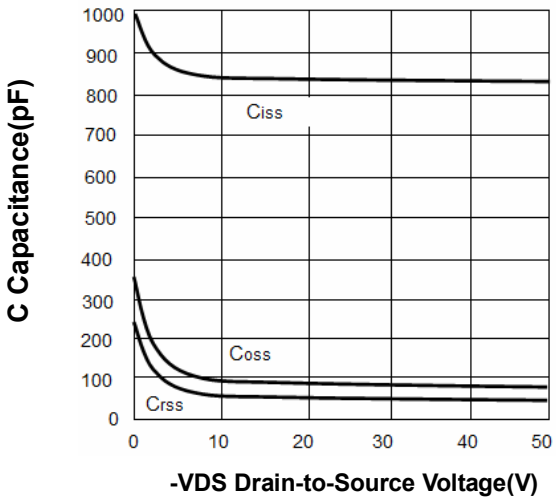


Figure6. $R_{DS(ON)}$ vs Junction Temperature

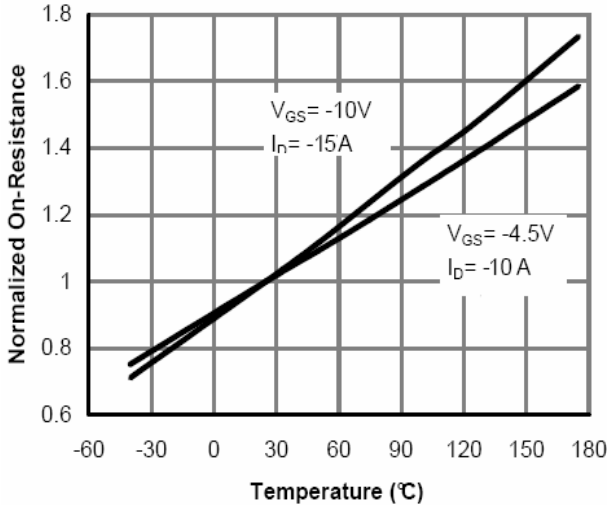


Figure7. $V_{GS(th)}$ vs Junction Temperature

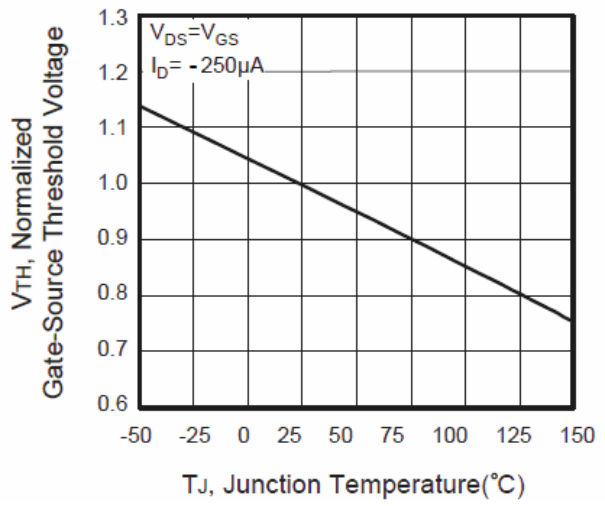


Figure8. Gate Charge Waveforms

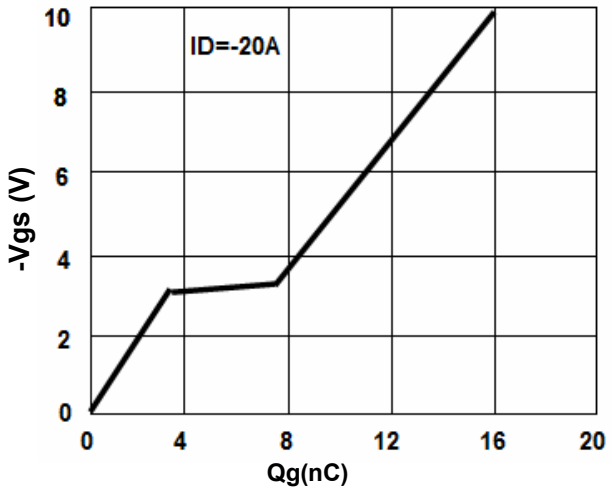


Figure9. Normalized Maximum Transient Thermal Impedance