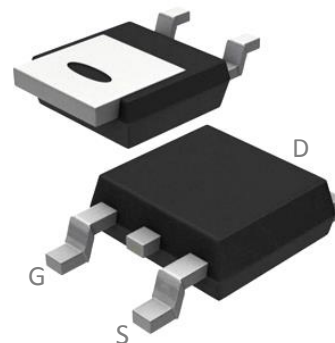


Description:

This P-Channel MOSFET uses advanced trench technology and

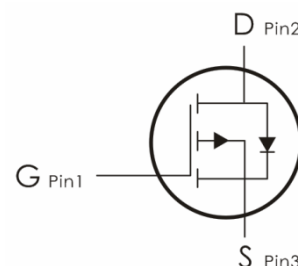
design to provide excellent $R_{DS(on)}$ with low gate charge.

It can be used in a wide variety of applications.



Features:

- 1) $V_{DS}=-40V, I_D=-36A, R_{DS(on)} < 21m\Omega @ V_{GS}=-10V$
- 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	-36	A
	Continuous Drain Current- $T_C=100^\circ C$	-25	
I_{DM}	Pulsed Drain Current ¹	-144	
P_D	Power Dissipation $T_C=25^\circ C$	60	mJ
	Power Dissipation $T_C=100^\circ C$	30	W
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +175	$^\circ C$

Thermal Characteristics:

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Thermal Resistance, Junction to Case ¹	2.5	$^\circ C/W$

Package Marking and Ordering Information:

Part NO.	Marking	Package
P2504EDG	P2504EDG	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-Sourctce Breakdown Voltage	V _{GS} =0V, I _D =-250 μ A	-40	---	---	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{GS} =0V, V _{DS} =-40V	---	---	-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	-1.1	-1.7	-2.5	V
R _{DS(ON)}	Drain-Source On Resistance	V _{GS} =-10V, I _D =-20A	---	15	21	m Ω
		V _{GS} =-4.5V, I _D =-15A	---	21	32	
G _{FS}	Forward Transconductance	V _{DS} =-5V, I _D =-5A	15	---	---	S
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =-20V, V _{GS} =0V, f=1MHz	---	2050	---	pF
C _{oss}	Output Capacitance		---	260	---	
C _{rss}	Reverse Transfer Capacitance		---	150	---	
Switching Characteristics						
t _{d(on)}	Turn-On Delay Time	V _{DS} =-20V, R _L =1.6 Ω R _{GEN} =3 Ω , V _{GS} =-10V	---	10	---	ns
t _r	Rise Time		---	24	---	ns
t _{d(off)}	Turn-Off Delay Time		---	40	---	ns
t _f	Fall Time		---	9	---	ns
Q _g	Total Gate Charge	V _{GS} =-10V, V _{DS} =-20V, I _D =-8A	---	45	---	nC
Q _{gs}	Gate-Source Charge		---	6	---	nC
Q _{gd}	Gate-Drain “Miller” Charge		---	11	---	nC
Drain-Source Diode Characteristics						
V _{SD}	Source-Drain Diode Forward Voltage	V _{GS} =0V, I _S =-10A,	---	---	-1.2	V

I_{SD}	Source-Drain Current(Body Diode)		---	---	-36	A
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Notes:

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

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

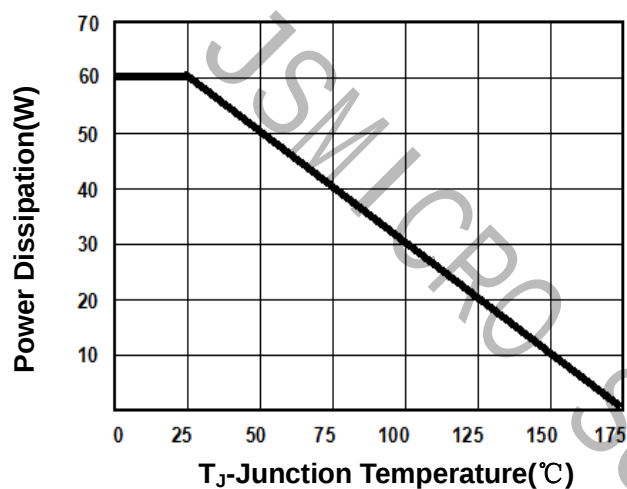
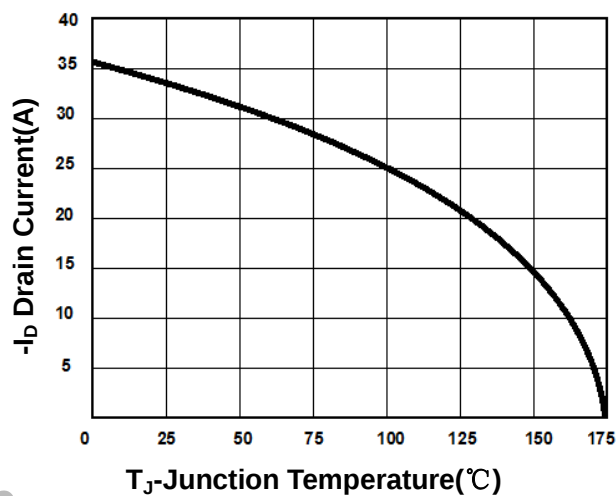
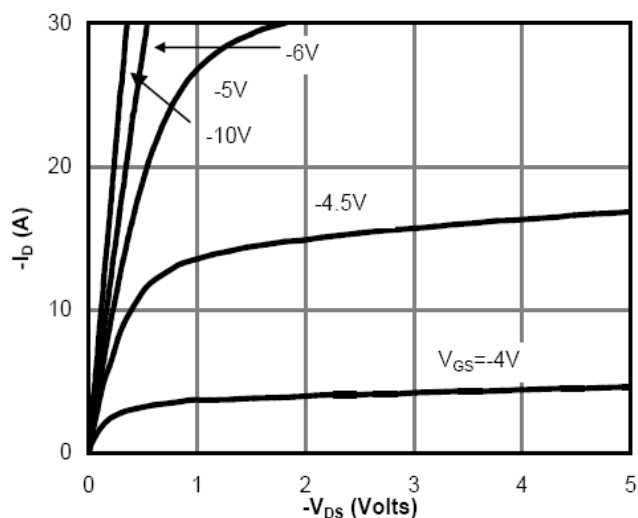
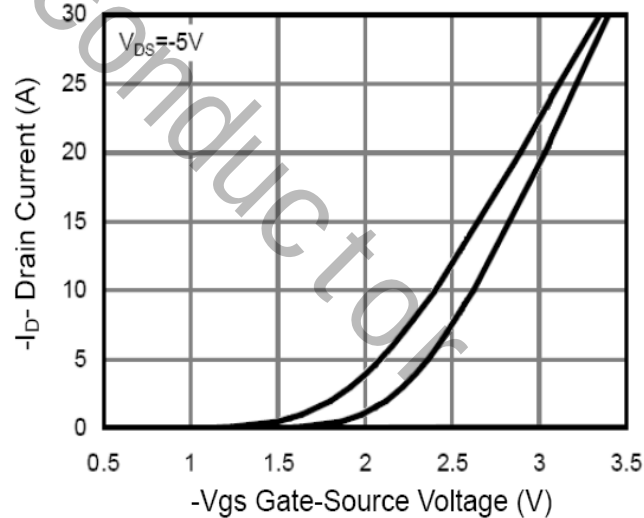
Figure1. Power Dissipation

Figure2. Drain Current

Figure3. Output Characteristics

Figure4. Transfer Characteristics


Figure5. Capacitance

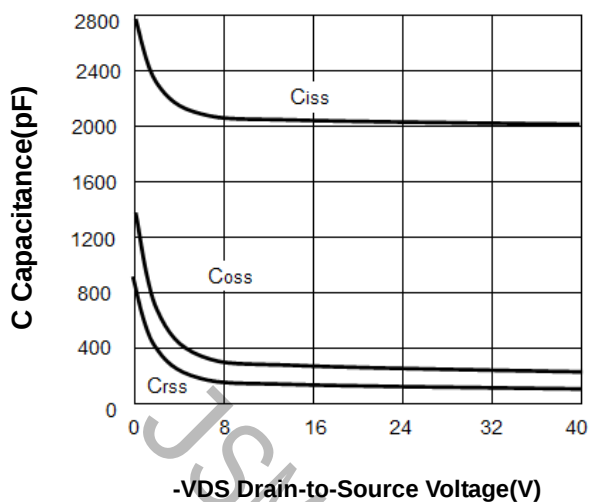
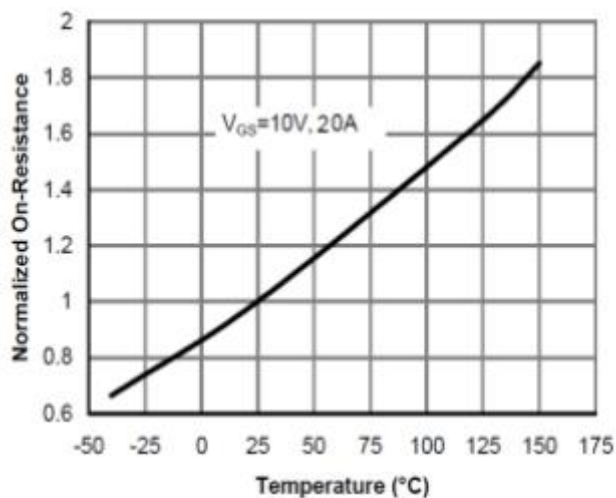
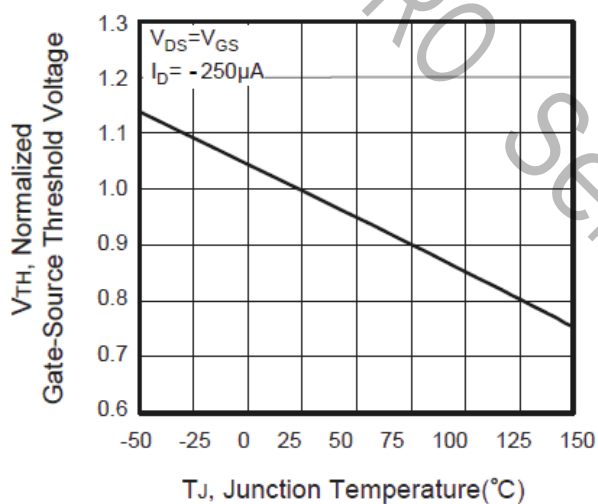

 Figure6. $R_{DS(ON)}$ vs Junction Temperature

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


Figure8. Gate Charge Waveforms

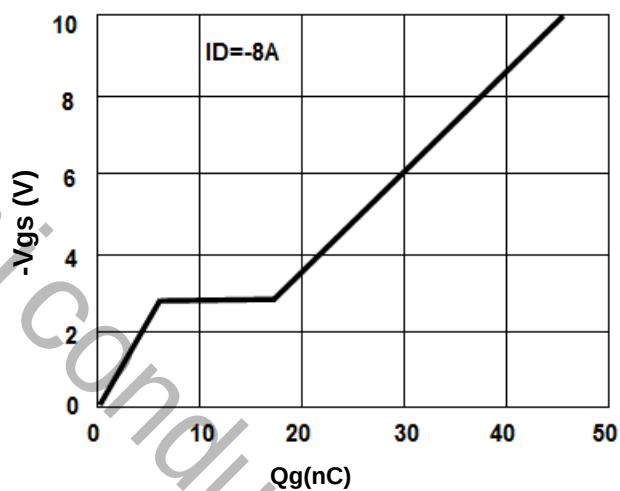


Figure9. Normalized Maximum Transient Thermal Impedance

