

Description:

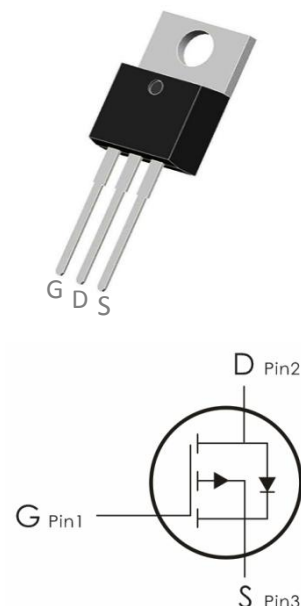
This P-Channel MOSFET uses advanced trench technology and

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

It can be used in a wide variety of applications.

Features:

- 1) $V_{DS}=-40V, I_D=-110A, R_{DS(on)}<5.5m\Omega$ @ $V_{GS}=-10V$ (Typ : $4.5m\Omega$)
- 2) Low gate charge.
- 3) Green device available.
- 4) Advanced high cell density trench technology for ultra low $R_{DS(on)}$.
- 5) Excellent package for good heat dissipation.



Package Marking and Ordering Information:

Part NO.	Marking	Package	Packing
DOP110P04	110P04	TO- 220	50 pcs/Tube

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	-110	A
	Continuous Drain Current- $T_C=100^{\circ}C$	-73	
I_{DM}	Pulsed Drain Current ¹	-416	
P_D	Power Dissipation	115	W
E_{AS}	Single pulse avalanche energy ²	576	mJ
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55-+175	$^{\circ}C$

Thermal Characteristics:

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Thermal Resistance, Junction to Case	1.3	$^{\circ}C/W$

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	---	-2.5	V
R _{DS(ON)}	Drain-Source On Resistance	V _{GS} =-10V, I _D =-20A	---	4.5	5.5	m Ω
		V _{GS} =-4.5V, I _D =-20A	---	6.1	8	m Ω
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =-20V, V _{GS} =0V, f=1MHz	---	6338	---	pF
C _{oss}	Output Capacitance		---	525	--	
C _{rss}	Reverse Transfer Capacitance		---	335	---	
Switching Characteristics						
t _{d(on)}	Turn-On Delay Time	V _{DS} =-20V R _{ENG} =3 Ω ,V _{GS} =-10V	---	16.8	---	ns
t _r	Rise Time		---	16.2	---	ns
t _{d(off)}	Turn-Off Delay Time		---	69	---	ns
t _f	Fall Time		---	32	---	ns
Q _g	Total Gate Charge	V _{GS} =-10V, V _{DS} =-20V, I _D =-20A	---	120	---	nc
Q _{gs}	Gate-Source Charge		---	12.4	---	nc
Q _{gd}	Gate-Drain “Miller” Charge		---	23	---	nc
Drain-Source Diode Characteristics						
V _{SD}	Diode Forward Voltage ³	V _{GS} =0V, I _{SD} =-20A	---	---	-1.2	V
I _S	Continuous Drain Curren	VD=VG=0V	---	---	-110	A
I _{SM}	Pulsed Drain Current		---	---	-416	A
T _{rr}	Reverse Recovery Time	I _F =-20A, T _J =25℃	---	24	---	ns
Q _{rr}	Reverse Recovery Charge	dI/dt=100A/us	---	140	---	nc

Notes:

- 1.Repetitive Rating: Pulse width limited by maximum junction temperature.
- 2.EAS condition: $T_J=25^{\circ}\text{C}$, $V_{DD}=-40\text{V}$, $V_G=-10\text{V}$, $R_g=25\Omega$, $L=0.5\text{mH}$.
- 3.Repetitive Rating: Pulse width limited by maximum junction temperature.

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

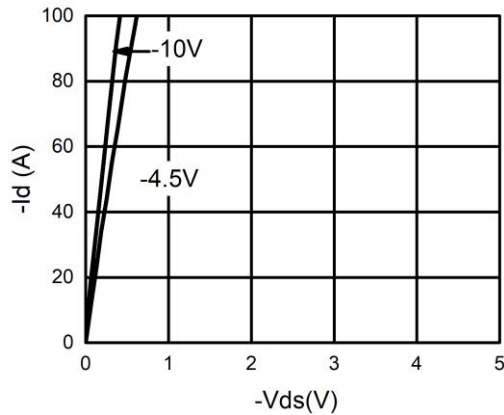


Figure 1. Output Characteristics

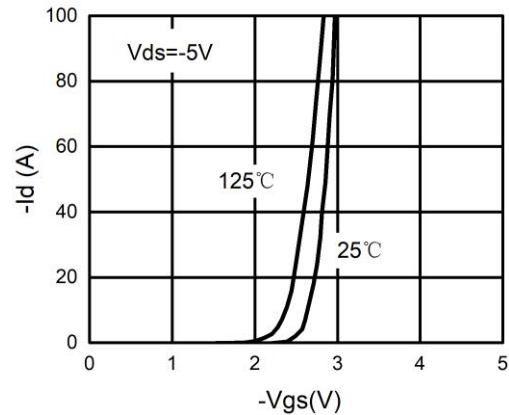


Figure 2. Transfer Characteristics

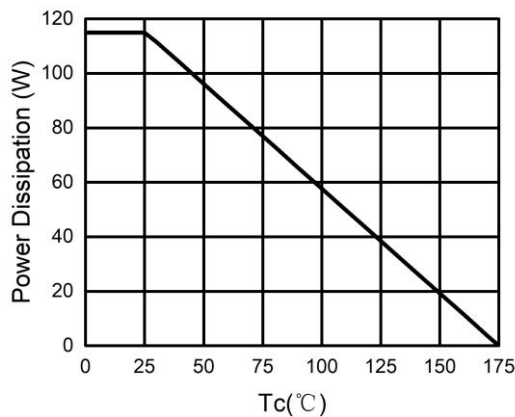


Figure 3. Power Dissipation

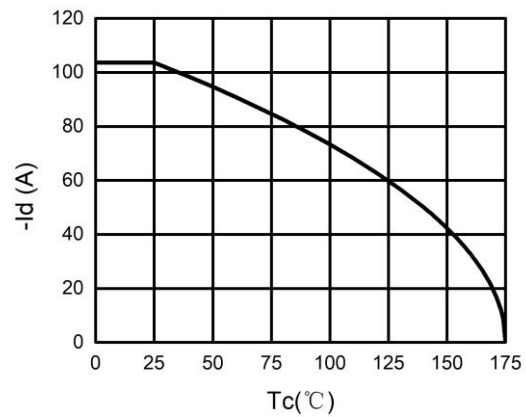


Figure 4. Drain Current

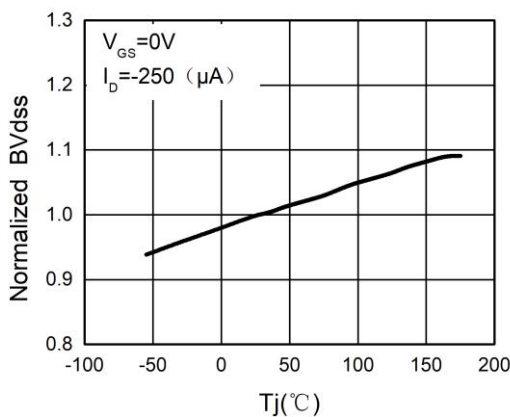


Figure 5. BV_{DSS} vs Junction Temperature

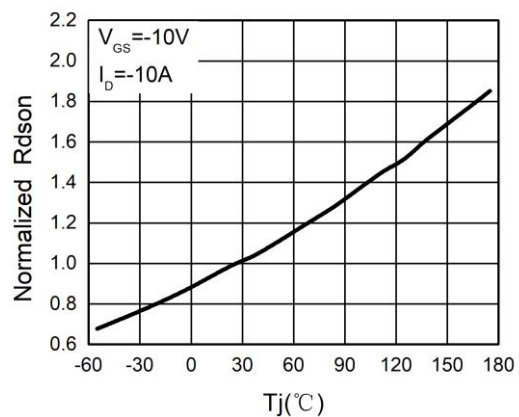


Figure 6. $R_{DS(ON)}$ vs Junction Temperature

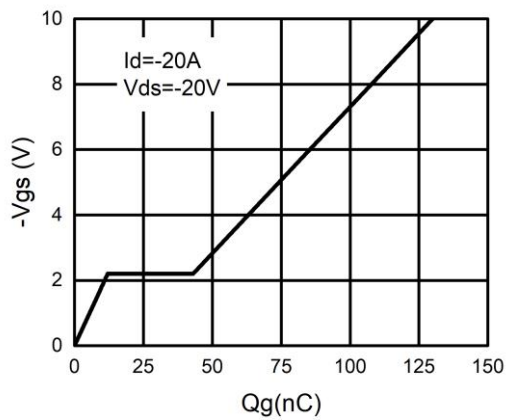


Figure 7. Gate Charge Waveforms

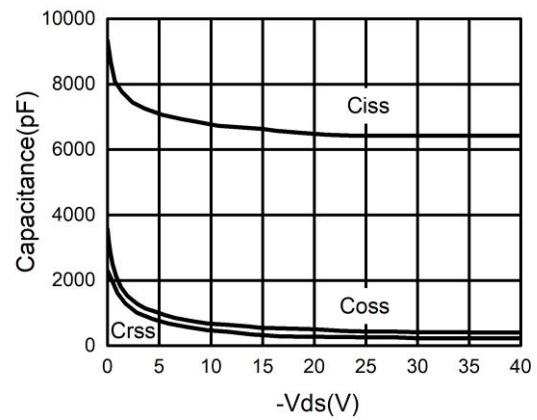


Figure 8. Capacitance

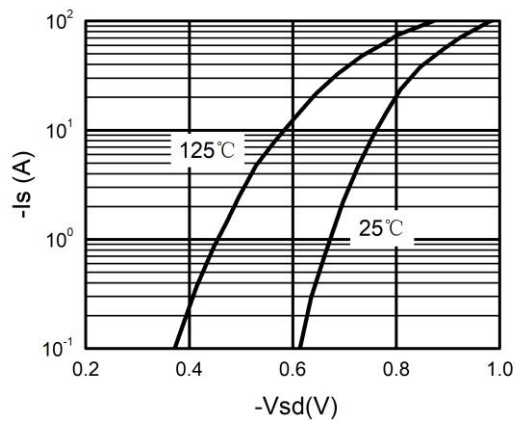


Figure 9. Body-Diode Characteristics

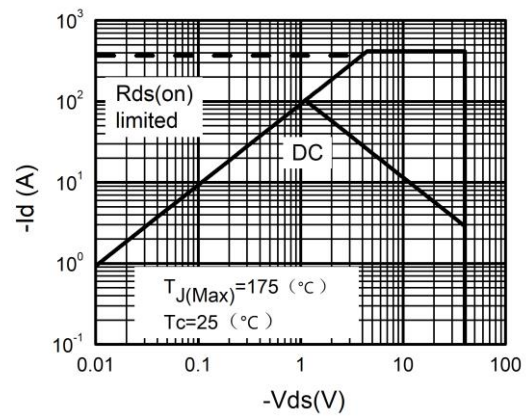
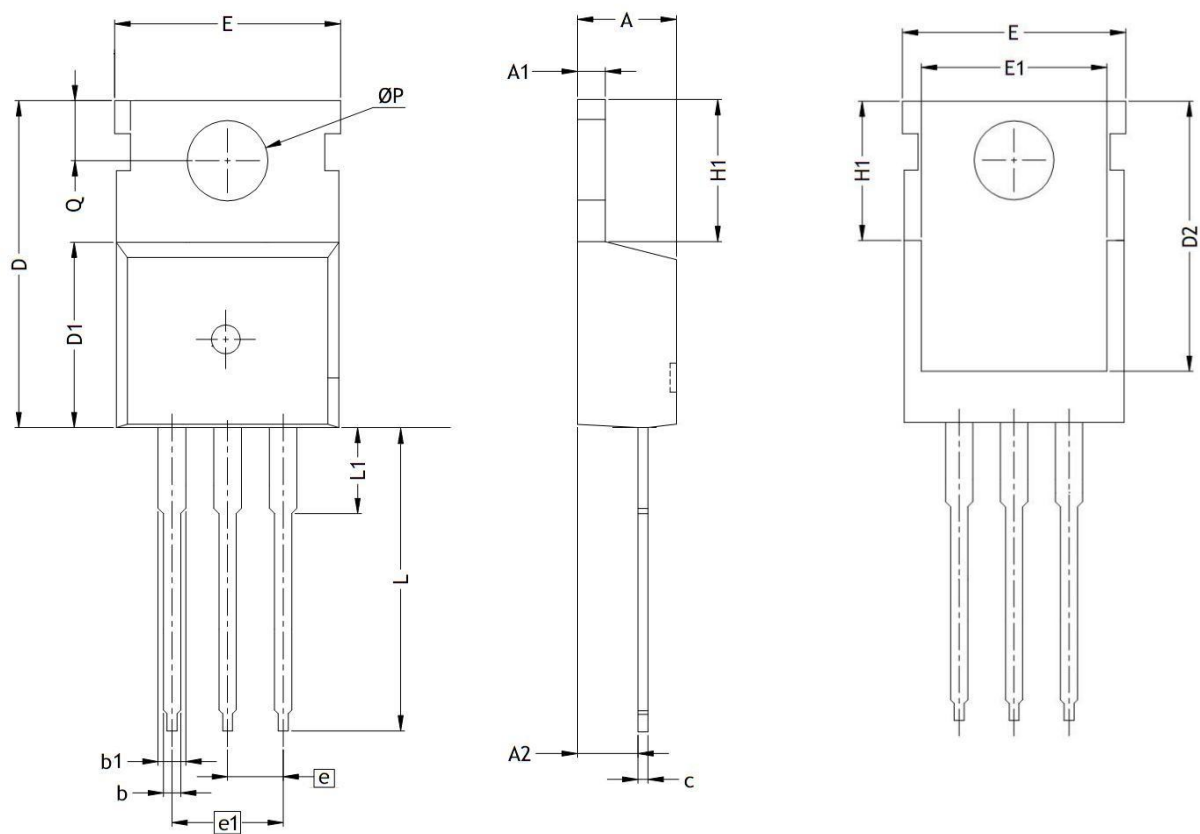


Figure 10. Maximum Safe Operating Area

TO-220 Package Information:



UNIT: mm

SYMBOLS	A	A1	A2	b	b1	c	D	D1	D2	E	E1	e
MIN	4.25	1.25	2.35	0.7	1.15	0.45	14.35	8.80	13.05	9.90	7.85	2.540
MAX	4.65	1.35	2.55	0.9	1.75	0.60	15.95	9.50	13.65	10.35	8.85	BSC
SYMBOLS	e1	H1	L	L1	Q	φP						
MIN	5.080	6.30	12.85	2.85	2.70	3.50						
MAX	BSC	6.65	13.50	3.25	2.90	3.70						

Marking Information:

①. Doingter LOGO

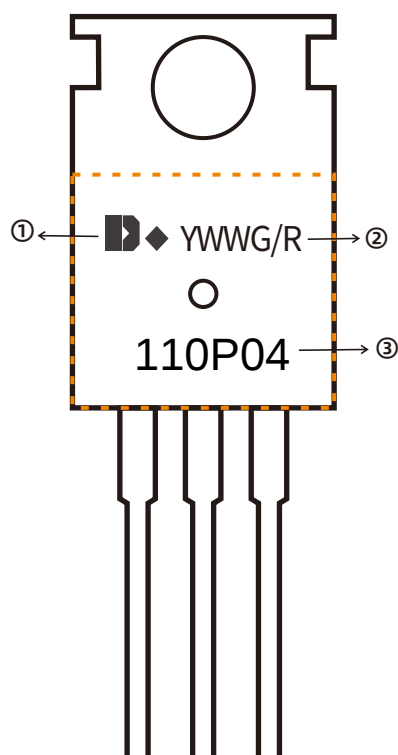
②. Date Code(YWWG / R)

Y : Year Code , last digit of the year

WW : Week Code(01-53)

G/R : G(Green) /R(Lead Free)

③. Part NO.

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