

Description:

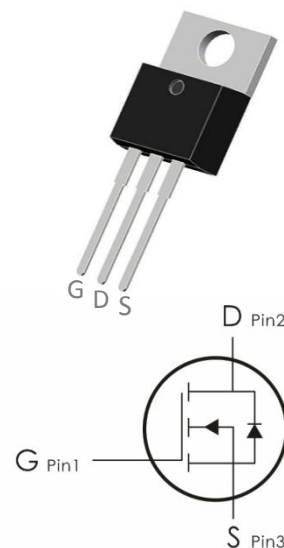
This N-Channel MOSFET uses advanced SGT technology and

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

It can be used in a wide variety of applications.

Features:

- 1) $V_{DS}=100V, I_D=140A, R_{DS(on)} < 4 m\Omega @ V_{GS}=10V$
- 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
DOP140N10T	140N10T	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	100	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Continuous Drain Current ¹	140	A
	Continuous Drain Current ¹ $T_C=100^{\circ}C$	100	
I_{DM}	Pulsed Drain Current ²	689	
P_D	Power Dissipation ⁴	312	W
E_{AS}	Single pulse avalanche energy ³	726	mJ
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55--+150	$^{\circ}C$

Thermal Characteristics:

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Thermal Resistance, Junction to Case	0.6	$^{\circ}C/W$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient ⁴	55	$^{\circ}C/W$

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

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250 μ A	100	---	---	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{GS} =0V, V _{DS} =100V	---	---	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	2	3	4	V
R _{DS(ON)}	Drain-Source On Resistance	V _{GS} =10V, I _D =20A	---	3.2	4	m Ω
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =50V, V _{GS} =0V, f=1MHz	---	4700	---	pF
C _{oss}	Output Capacitance		---	860	--	
C _{rss}	Reverse Transfer Capacitance		---	18	---	
Switching Characteristics						
t _{d(on)}	Turn-On Delay Time	V _{DS} =50V R _{ENG} =3 Ω ,V _{GS} =10V	---	19	---	ns
t _r	Rise Time		---	34	---	ns
t _{d(off)}	Turn-Off Delay Time		---	48	---	ns
t _f	Fall Time		---	29	---	ns
Q _g	Total Gate Charge	V _{GS} =10V, V _{DS} =50V, I _D =20A	---	80	---	nc
Q _{gs}	Gate-Source Charge		---	23	---	nc
Q _{gd}	Gate-Drain “Miller” Charge		---	25	---	nc
Drain-Source Diode Characteristics						
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _{SD} =1A	---	0.66	1	V
I _S	Continuous Drain Curren	V _D =V _G =0V	---	---	140	A
I _{SM}	Pulsed Drain Current		---	---	689	A
T _{rr}	Reverse Recovery Time	I _F =20A, T _J =25 °C	---	71	---	ns
Q _{rr}	Reverse Recovery Charge		dI/dt=100A/us	---	127	---

Notes:

1. Package limit
2. This single-pulse measurement was taken under $T_{J_Max} = 150^{\circ}\text{C}$.
3. E_{AS} of 726 mJ is based on starting $T_J = 25^{\circ}\text{C}$, $L = 3mH$, $I_{AS} = 22A$, $V_{GS} = 10V$, $V_{DD} = 50V$; 100% test at $L = 0.3mH$, $I_{AS} = 45A$.
 $T_{J_Max} = 150^{\circ}\text{C}$.
4. The power dissipation P_D is based on $T_{J_Max} = 150^{\circ}\text{C}$.
5. This value is guaranteed by design hence it is not included in the production test.

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

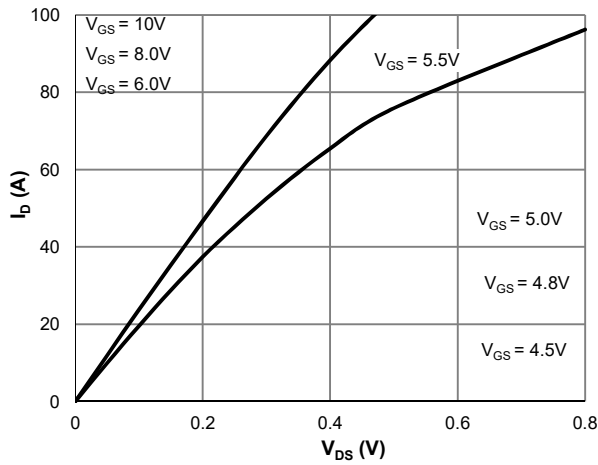


Figure 1: Saturation Characteristics

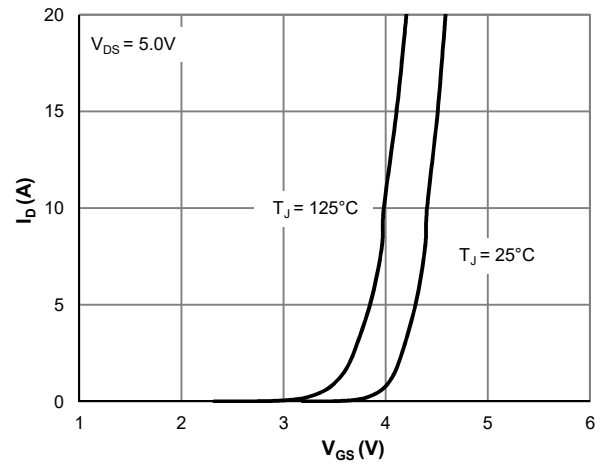


Figure 2: Transfer Characteristics

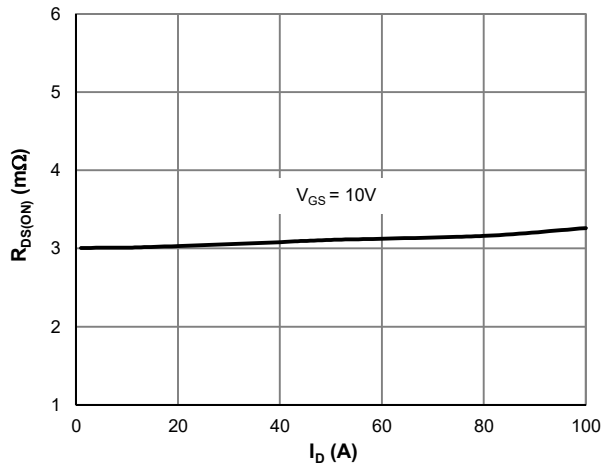


Figure 3: $R_{DS(ON)}$ vs. Drain Current

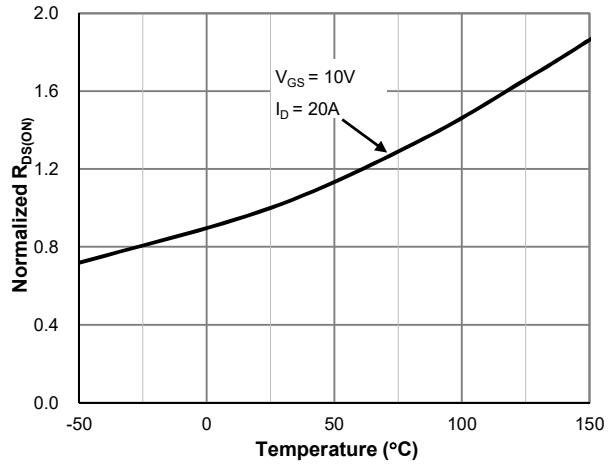


Figure 4: $R_{DS(ON)}$ vs. Junction Temperature

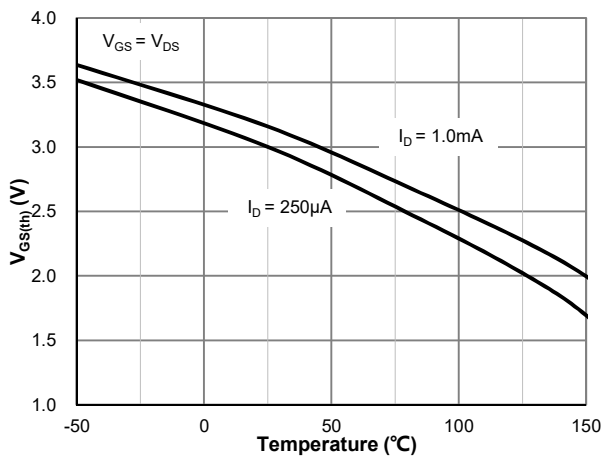


Figure 5: $V_{GS(th)}$ vs. Junction Temperature

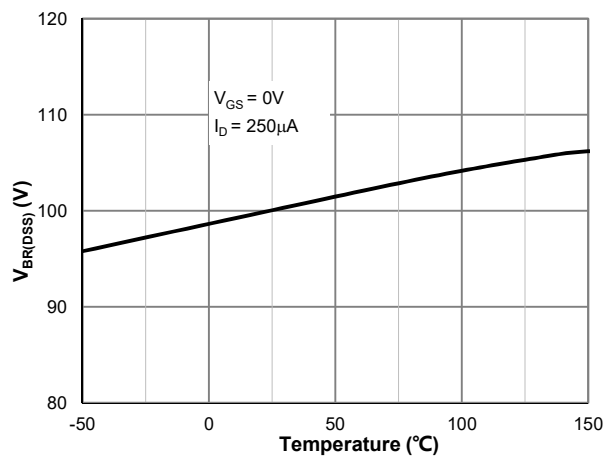


Figure 6: $V_{BR(DSS)}$ vs. Junction Temperature

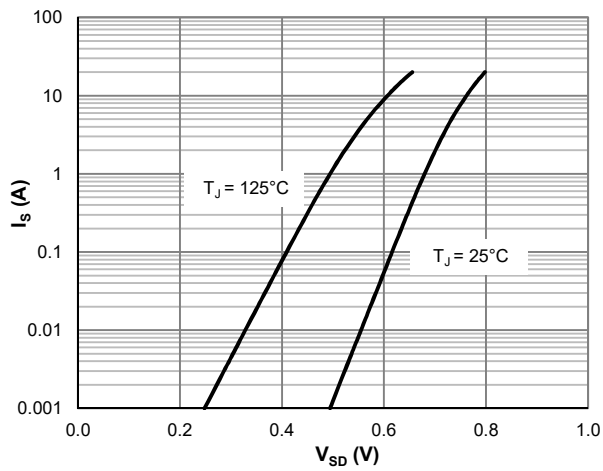


Figure 7: Body-Diode Characteristics

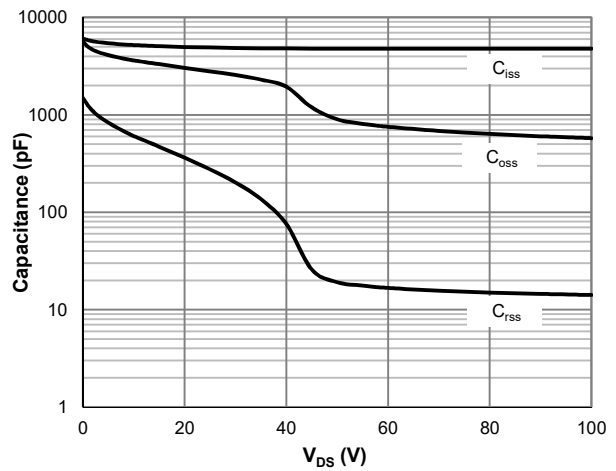


Figure 8: Capacitance Characteristics

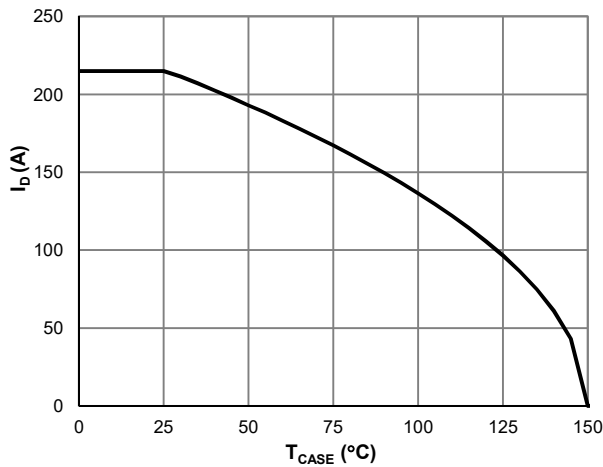


Figure 9: Current De-rating

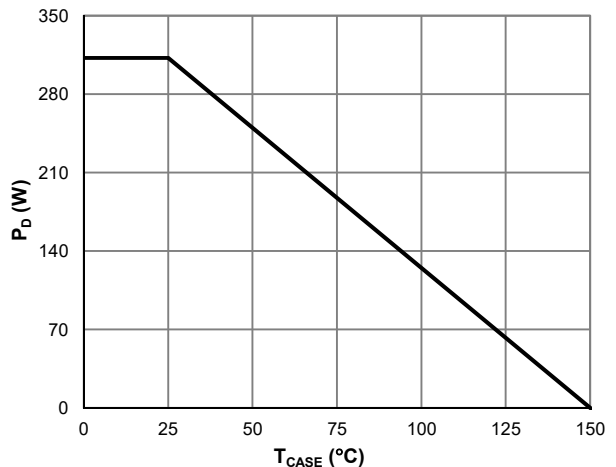


Figure 10: Power De-rating

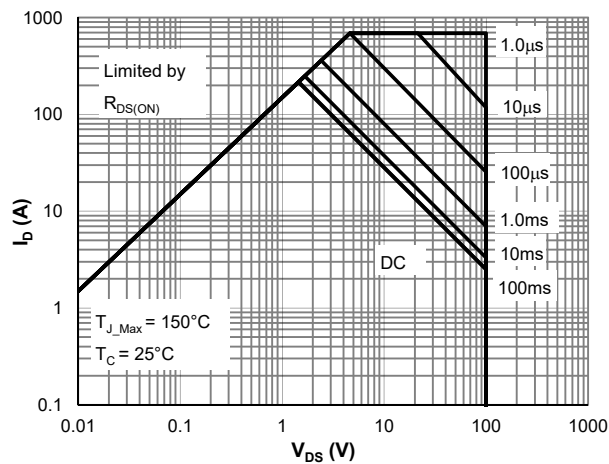


Figure 11: Maximum Safe Operating Area

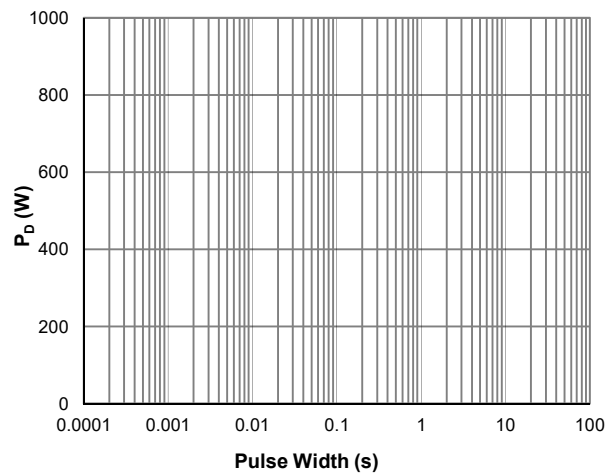


Figure 12: Single Pulse Power Rating, Junction-to-Case

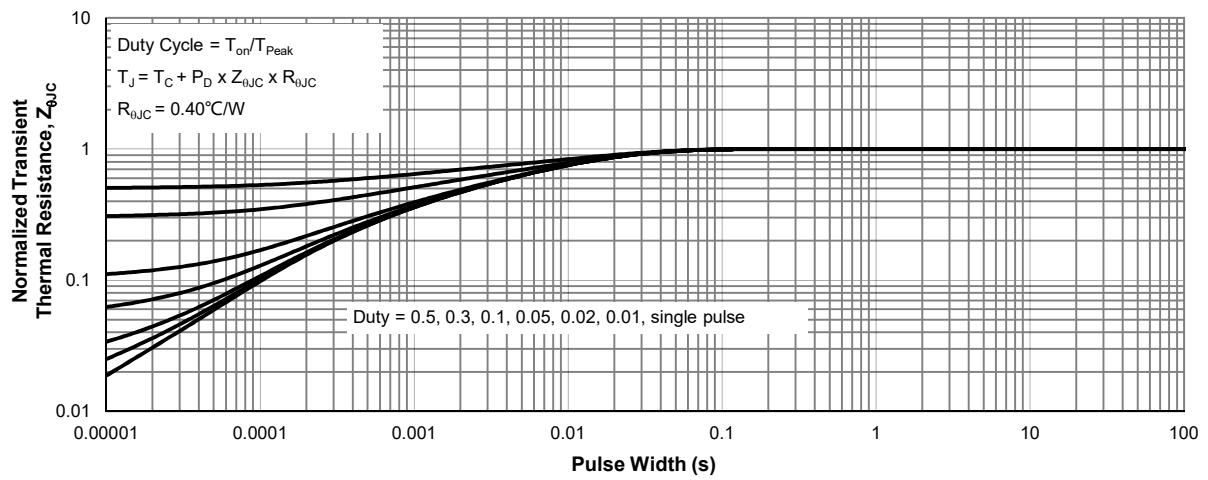
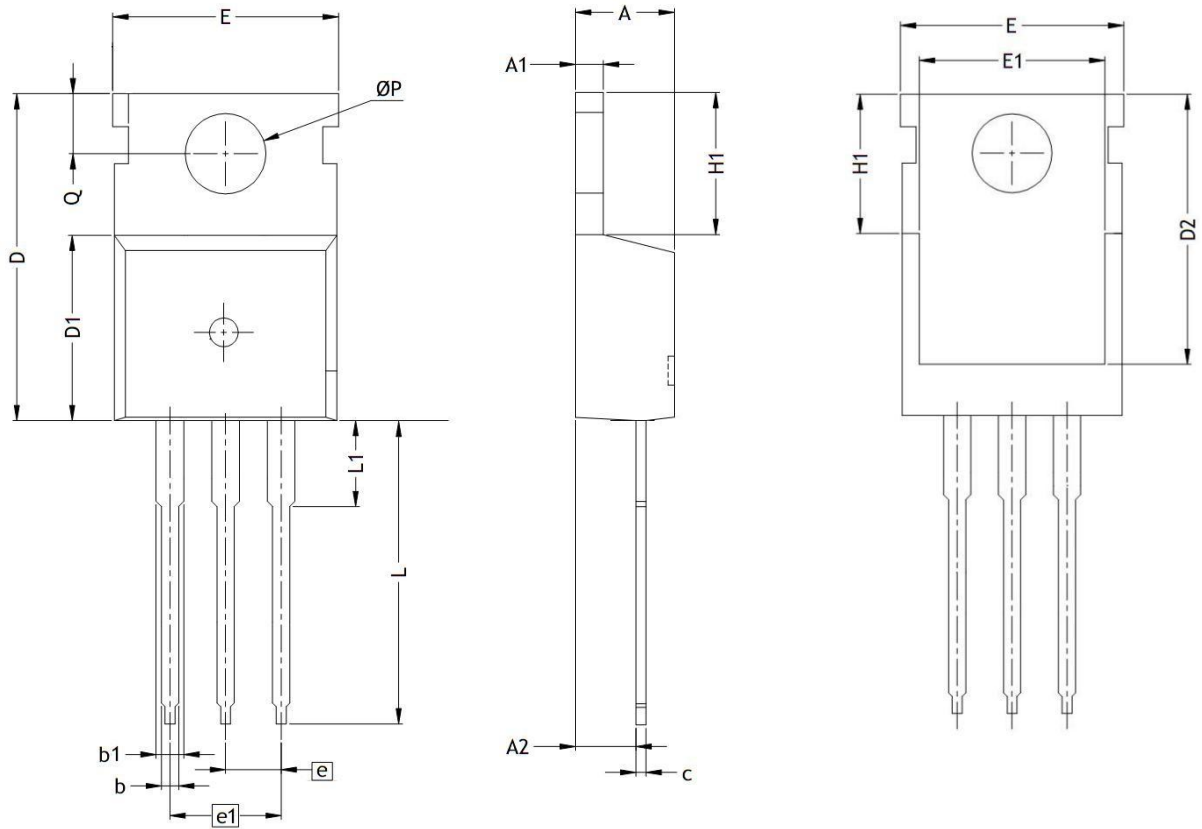


Figure 13: Normalized Maximum Transient Thermal Impedance

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

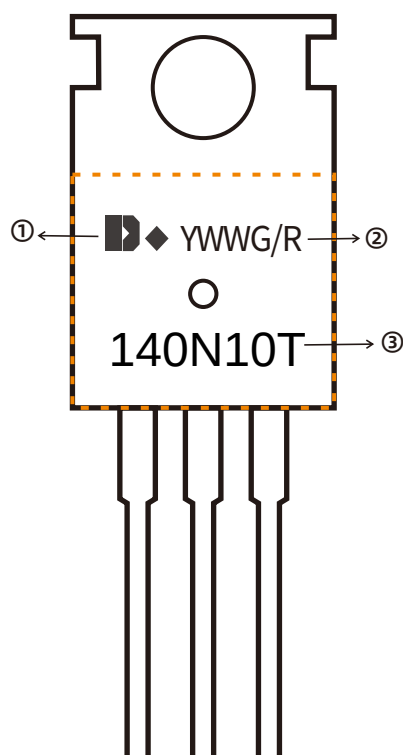
②. Date Code(YWWG / R)

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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