

Description:

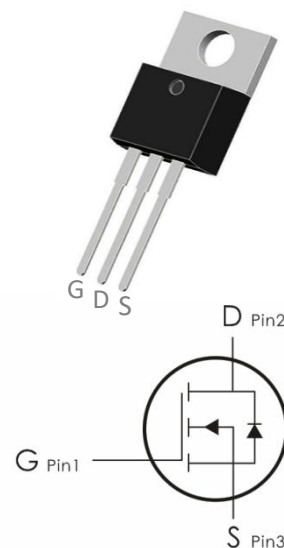
This N-Channel MOSFET uses advanced SGT technology and

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

It can be used in a wide variety of applications.

Features:

- 1) $V_{DS}=100V, I_D=130A, R_{DS(on)} < 4.5m\Omega @ V_{GS}=10V$ (Typ: $4.1m\Omega$)
- 2) Low gate charge.
- 3) Green device available.
- 4) Advanced high cell density SGT technology for ultra low $R_{DS(on)}$.
- 5) Excellent package for good heat dissipation.



Package Marking and Ordering Information:

Part NO.	Marking	Package	Packing
DOP130N10T	130N10T	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	130	A
	Continuous Drain Current- $T_C=100^\circ C$ ¹	91	
I_{DM}	Pulsed Drain Current ²	520	
P_D	Power Dissipation	133	W
E_{AS}	Single pulse avalanche energy ³	230	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	0.94	$^\circ C/W$

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 ⁴	V _{GS} =10V, I _D =20A	---	4.1	4.5	m Ω
Dynamic Characteristics						
C _{iss}	Input Capacitance	V _{DS} =50V, V _{GS} =0V, f=1MHz	---	3900	---	pF
C _{oss}	Output Capacitance		---	2200	--	
C _{rss}	Reverse Transfer Capacitance		---	1000	---	
Switching Characteristics						
t _{d(on)}	Turn-On Delay Time	V _{DS} =50V, I _D =20A, R _{ENG} =3 Ω ,V _{GS} =10V	---	14	---	ns
t _r	Rise Time		---	7	---	ns
t _{d(off)}	Turn-Off Delay Time		---	32	---	ns
t _f	Fall Time		---	11	---	ns
Q _g	Total Gate Charge	V _{GS} =10V, V _{DS} =50V, I _D =20A	---	57	---	nC
Q _{gs}	Gate-Source Charge		---	16	---	nC
Q _{gd}	Gate-Drain “Miller” Charge		---	11	---	nC
Drain-Source Diode Characteristics						
V _{SD}	Diode Forward Voltage	V _{GS} =0V, I _{SD} =20A	---	---	1	V
I _S	Continuous Drain Current	V _D =V _G =0V	---	---	130	A
I _{SM}	Pulsed Drain Current		---	---	520	A
T _{rr}	Reverse Recovery Time	I _F =20A, T _J =25 °C	---	75	---	ns
Q _{rr}	Reverse Recovery Charge	dI/dt=100A/us	---	3	---	nC

Notes:

1. Computed continuous current assumes the condition of $T_{j,Max}$ while the actual continuous current depends on the thermal & electro-mechanical application board design
2. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
3. EAS condition : $T_J=25^{\circ}C, V_{DD}=50V, V_G=10V, L=0.5mH$
4. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 0.5\%$

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

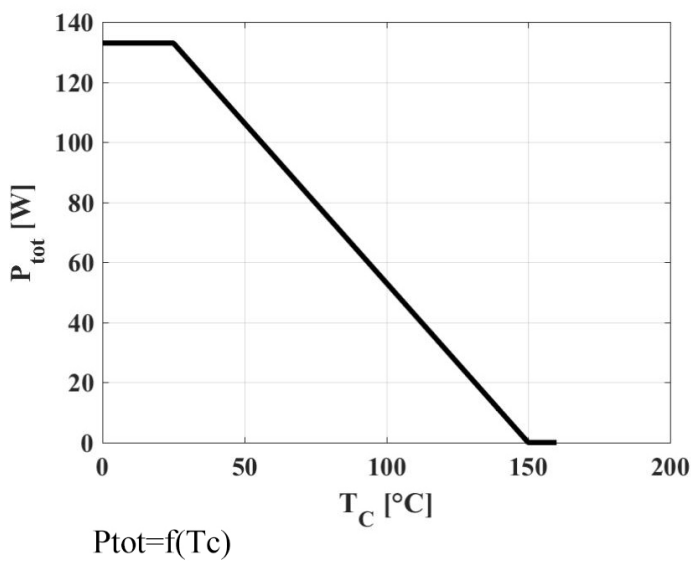


Figure 1 :PowerDissipation

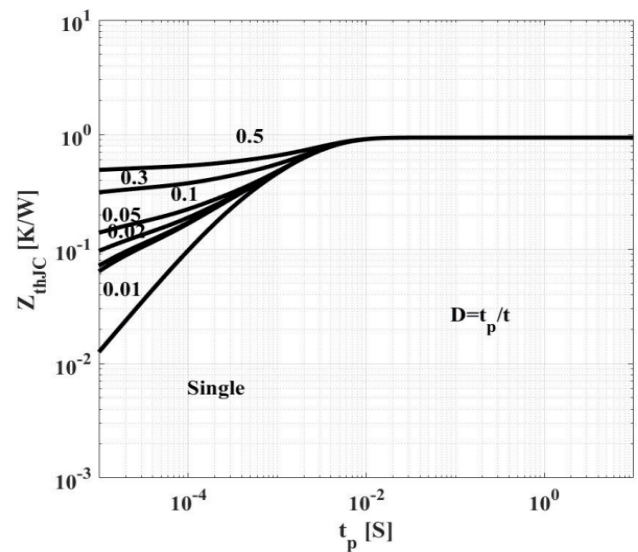


Figure 2 : Max. Transient Thermal Impedance

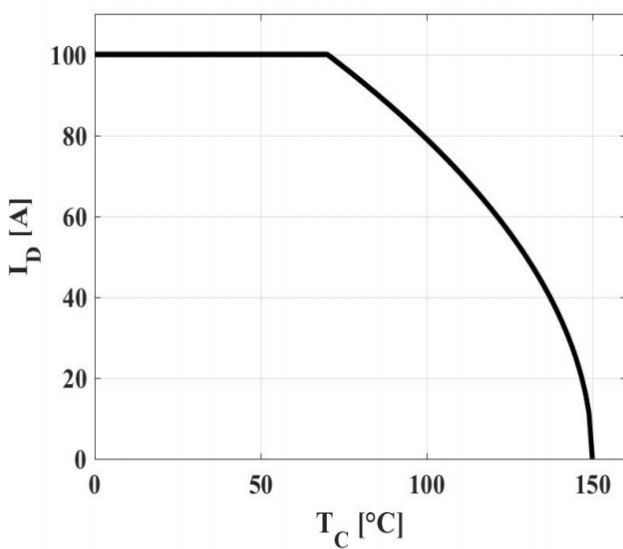


Figure 3 : Typ. Drain Current(TO-220C)

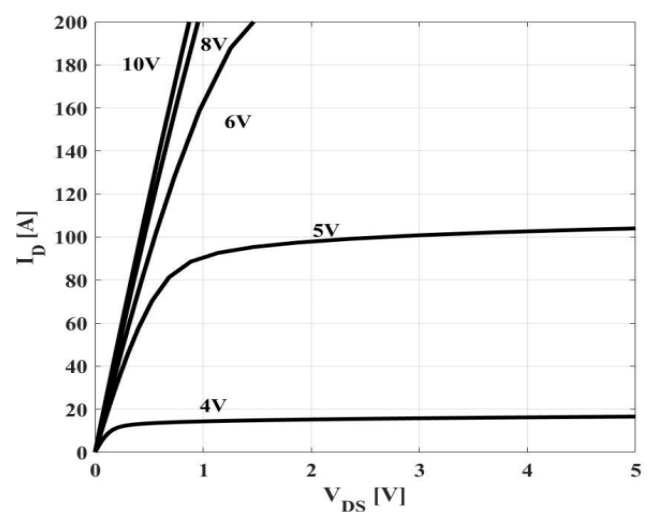
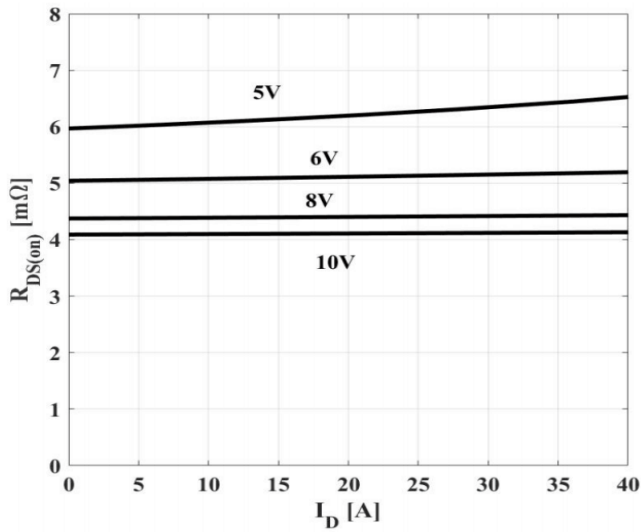
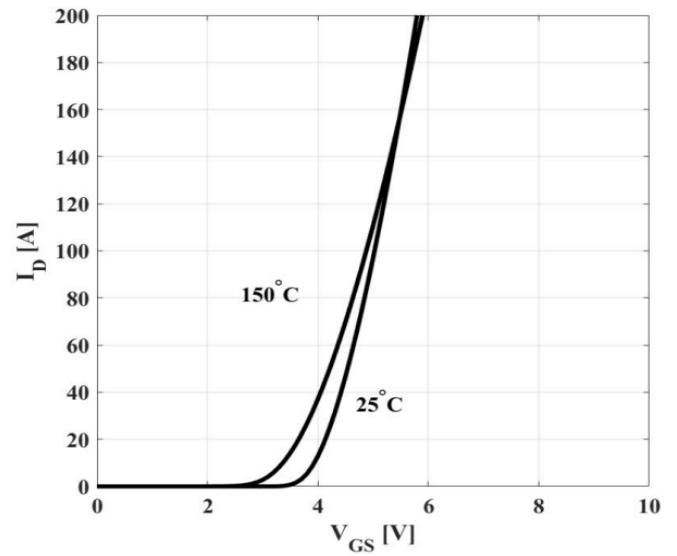


Figure 4 : Typ. Output Characteristics



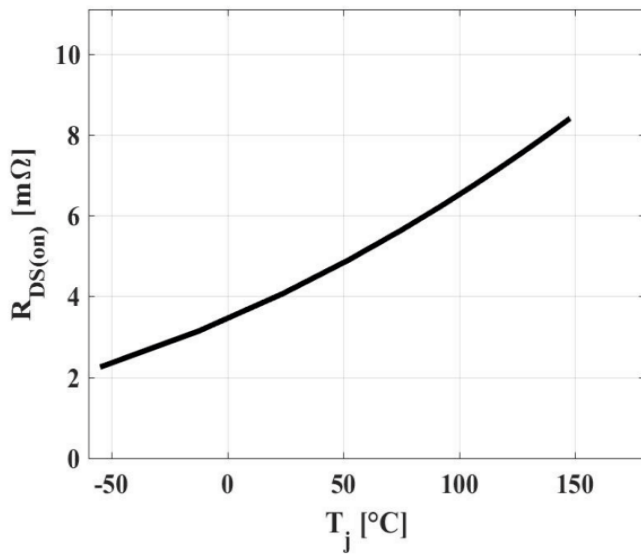
$$R_{DS(ON)} = f(I_D); T_j = 25^\circ\text{C}; \text{ parameter: } V_{GS}$$

Figure 5 : Typ. Drain-Source On-State Resistance



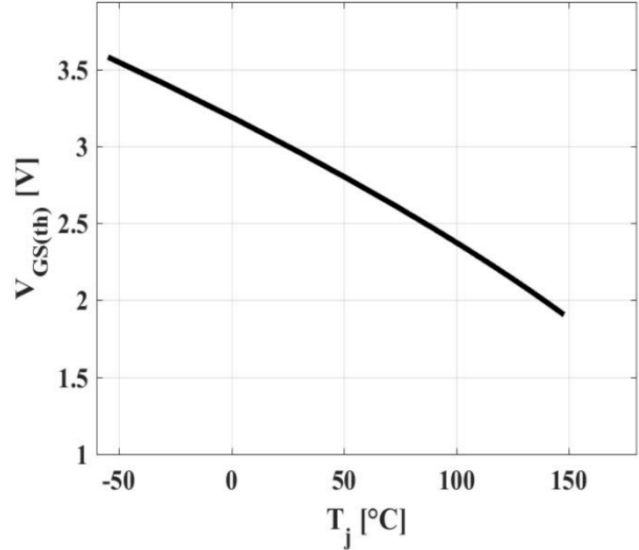
$$I_D = f(V_{GS}); |V_{DS}| > 2|I_D|R_{DS(on)max}; \text{ parameter: } T_j$$

Figure 6 : Typ. Transfer Characteristics



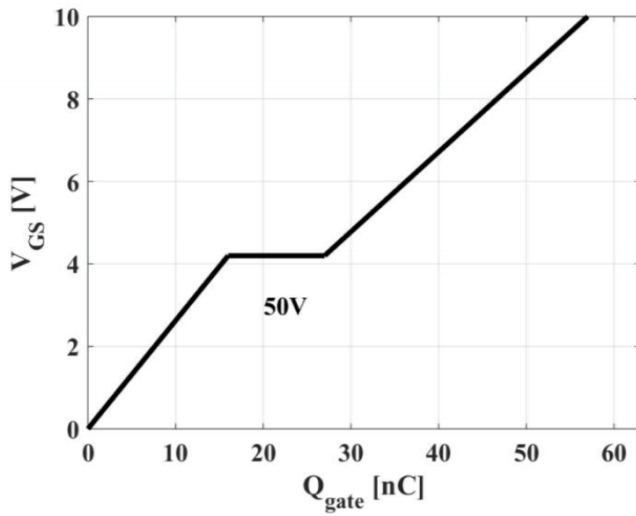
$$R_{DS(ON)} = f(T_j); I_D = 20\text{A}; V_{GS} = 10\text{V}$$

Figure 7 : Typ. Drain-Source On-State Resistance



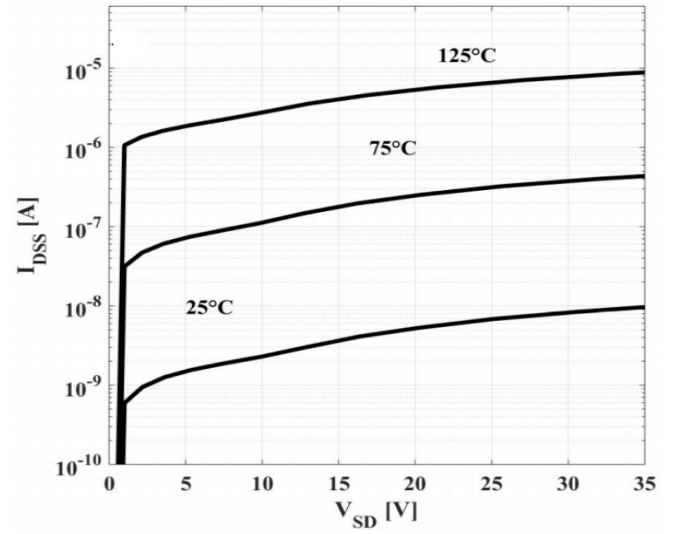
$$V_{GS(th)} = f(T_j); V_{GS} = V_{DS}; I_{DS} = 250\mu\text{A}$$

Figure 8 : Typ. Gate Threshold Voltage



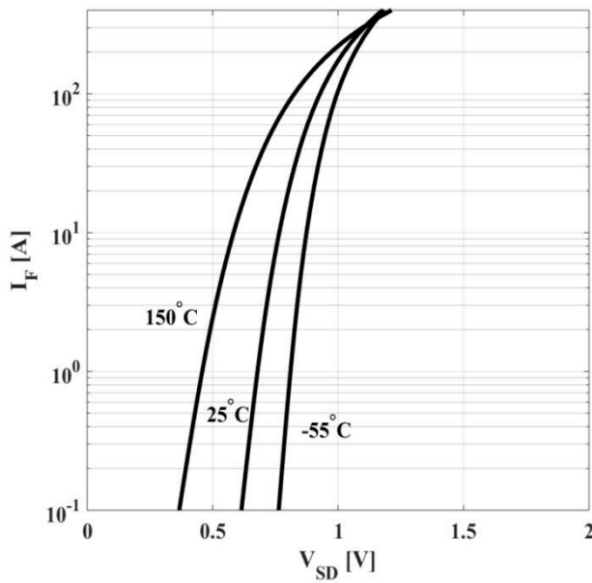
$$V_{GS} = f(Q_{gate}), I_D = 20A \text{ pulsed}$$

Figure 9 : Typ. Gate Charge



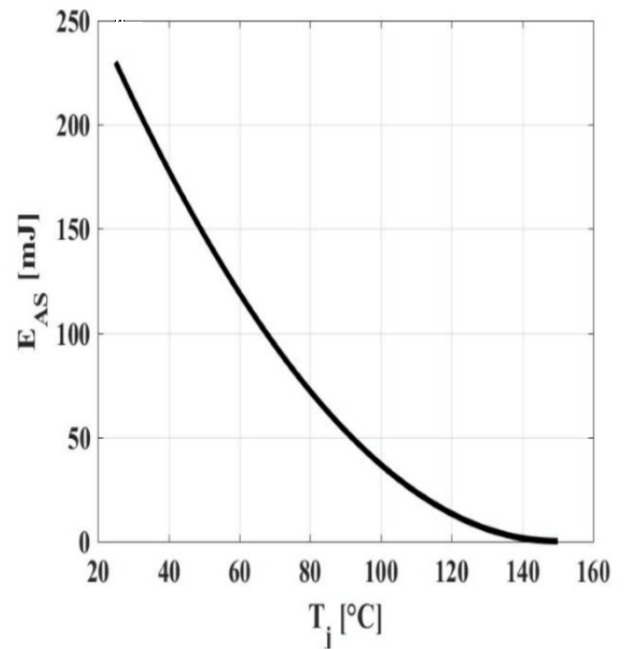
$$I_{DSS} = f(V_{DS}); V_{GS} = 0V; \text{ parameter: } T_j$$

Figure 10: Drain-Source Leakage Current



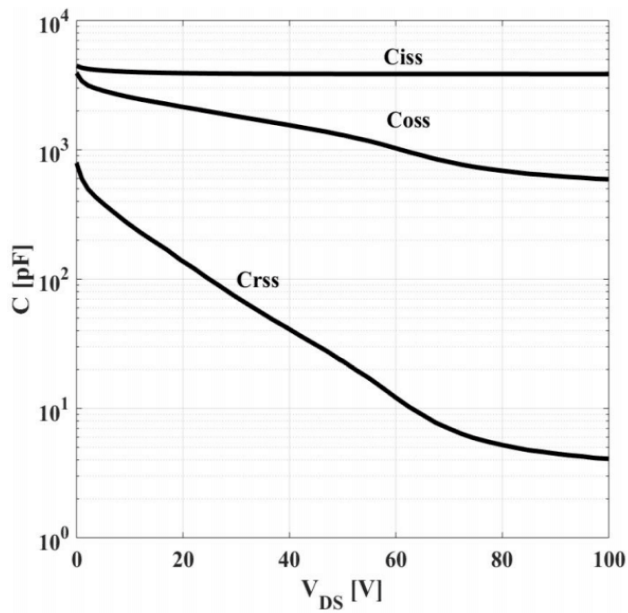
$$I_F = f(V_{SD}); \text{ parameter: } T_j$$

Figure 11: Forward Characteristics of Reverse Diode



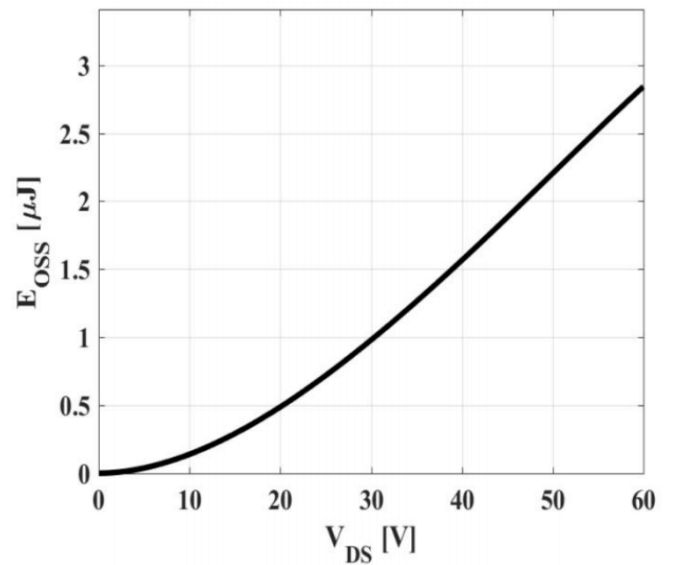
$$E_{AS} = f(T_j); I_D = 20.0A; V_{DD} = 20V$$

Figure 12: Avalanche Energy



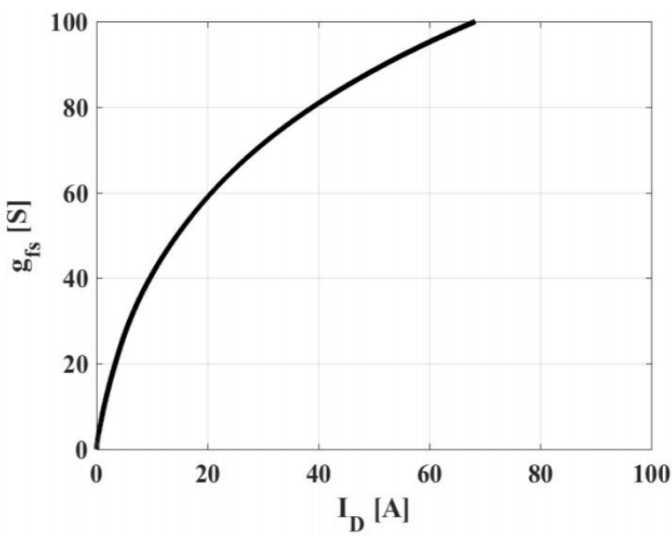
$$C=f(V_{DS}); V_{GS}=0; f=1\text{MHz}$$

Figure 13 : Typ. Capacitances



$$E_{OSS}=f(V_{DS})$$

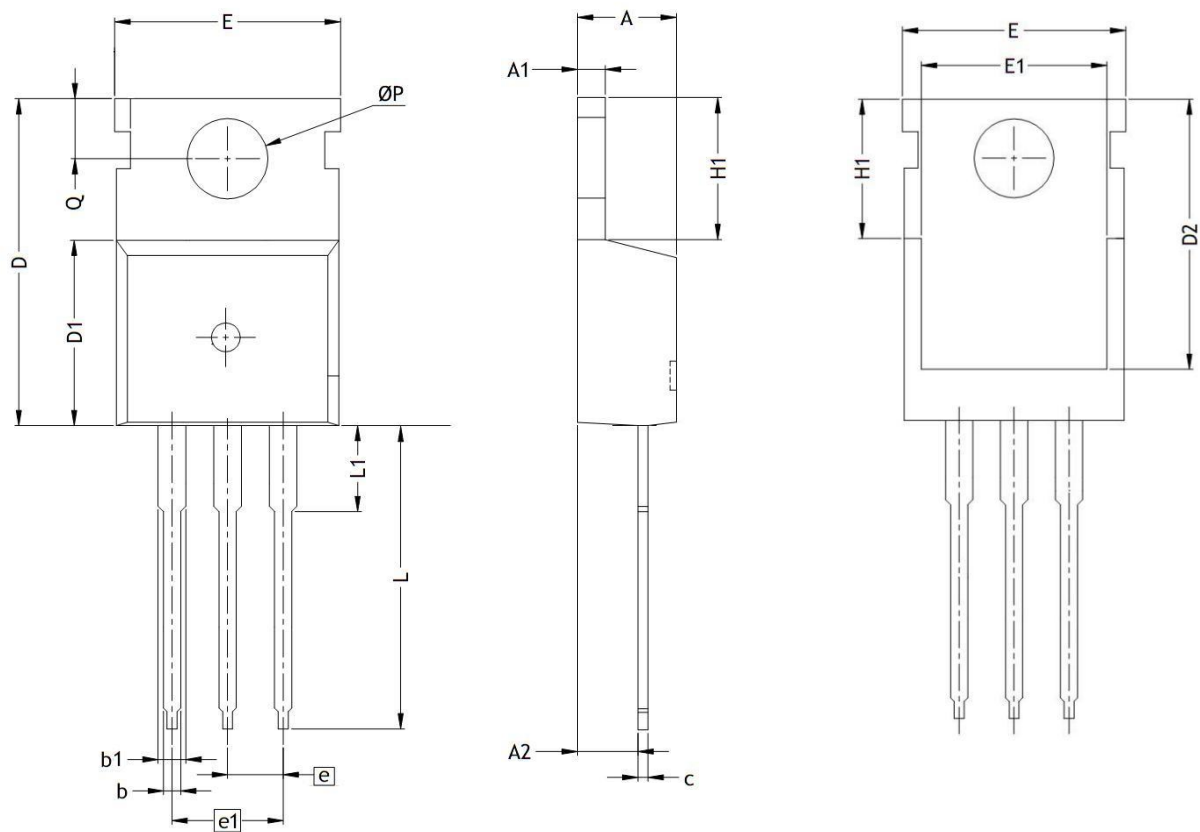
Figure 14: CossStored Energy



$$g_{fs}=f(I_D); T_J=25^{\circ}\text{C}$$

Figure15 : Typ. Forward Transconductance

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

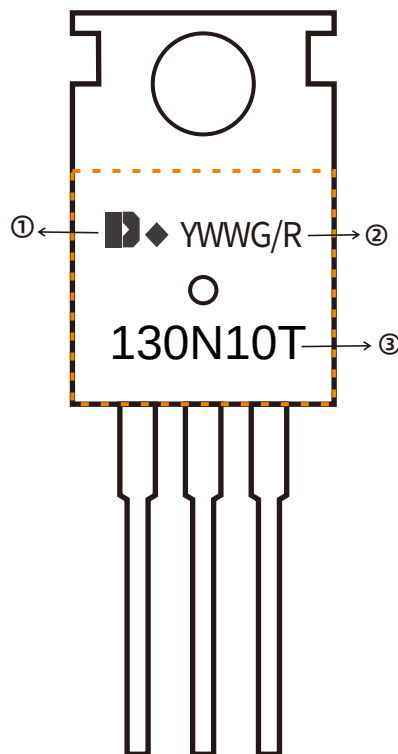
②. Date Code(YWWG / R)

Y : Year Code , last digit of the year

WW : Week Code(01-53)

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

③. Part NO.



Previous Version

Version	Date	Subjects (major changes since last revision)
1.0	2025-02-10	Release of final version

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