

Description:

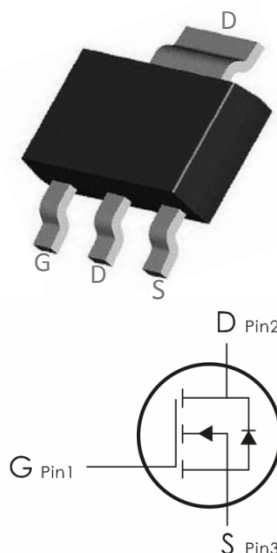
This N-Channel MOSFET uses advanced trench technology and

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

It can be used in a wide variety of applications.

Features:

- 1) $V_{DS}=100V, I_D=6A, R_{DS(on)} < 120m\Omega @ V_{GS}=10V$
- 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
DOT6N10	6N10	SOT-223	4000 pcs/Reel

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- $T_C=25^\circ C$	6	A
I_{DM}	Pulsed Drain Current ^(Note 1)	18	
P_D	Power Dissipation	2.4	W
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55 to +150	$^\circ C$

Thermal Characteristics:

Symbol	Parameter	Max	Units
$R_{\theta JA}$	Thermal Resistance Junction to mbient ^(Note 2)	52	$^\circ C/W$

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	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 ^(Note 3)						
V _{GS(th)}	GATE-Source Threshold Voltage	V _{GS} =V _{DS} , I _D =250 μ A	1	1.7	3	V
R _{DS(ON)}	Drain-Source On Resistance	V _{GS} =10V,I _D =3A	---	112	120	m Ω
		V _{GS} =4.5V,I _D =2A	---	120	145	
G _{FS}	Forward Transconductance	V _{DS} =5V , I _D =3A	---	11	---	S
Dynamic Characteristics ^(Note 4)						
C _{iss}	Input Capacitance	V _{DS} =25V, V _{GS} =0V, f=1MHz	---	600	978	pF
C _{oss}	Output Capacitance		---	38	---	
C _{rss}	Reverse Transfer Capacitance		---	24	---	
Switching Characteristics ^(Note 4)						
t _{d(on)}	Turn-On Delay Time	V _{DS} =50V,I _D =1A,R _G =3.3Ω V _{GS} =10V	---	7	---	ns
t _r	Rise Time		---	5	---	ns
t _{d(off)}	Turn-Off Delay Time		---	16	---	ns
t _f	Fall Time		---	6	---	ns
Q _g	Total Gate Charge	V _{GS} =10, V _{DS} =80V, I _D =3A	---	12	20	nC
Q _{gs}	Gate-Source Charge		---	2.2	---	nC
Q _{gd}	Gate-Drain “Miller” Charge		---	2.5	---	nC
Drain-Source Diode Characteristics						
V _{SD}	Drain Diode Forward Voltage ^(Note 3)	V _{GS} =0V,I _S =2A,T _J =25 °C	---	---	1.2	A
T _{rr}	Reverse Recovery Time	I _S =3A , V _{GS} =0V dI/dt=100A/μs	---	22	---	A
Q _{rr}	Reverse Recovery Charge		---	---	---	A
I _D	Continuous Drain Current-T _C =25 °C	VD=VG=0V	---	6	---	A
I _{DM}	Pulsed Drain Current ^(Note 1)		---	18	---	

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, $t \leq 10$ sec.
3. Pulse Test: Pulse Width $\leq 300 \mu s$, Duty Cycle $\leq 2\%$.
4. Guaranteed by design, not subject to product

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

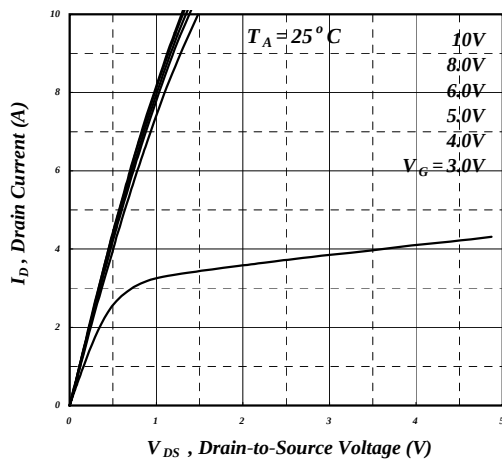


Fig 1. Typical Output Characteristics

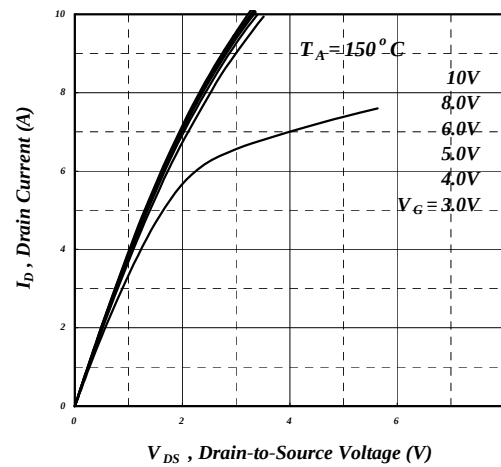


Fig 2. Typical Output Characteristics

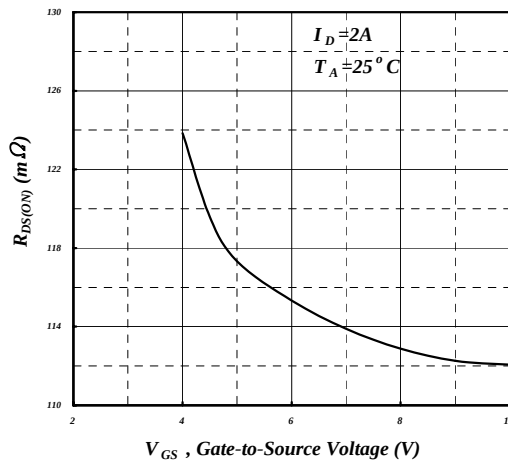
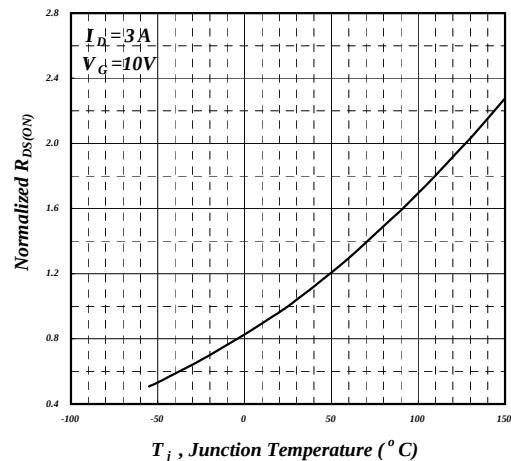


Fig 3. On-Resistance v.s. Gate Voltage



**Fig 4. Normalized On-Resistance
v.s. Junction Temperature**

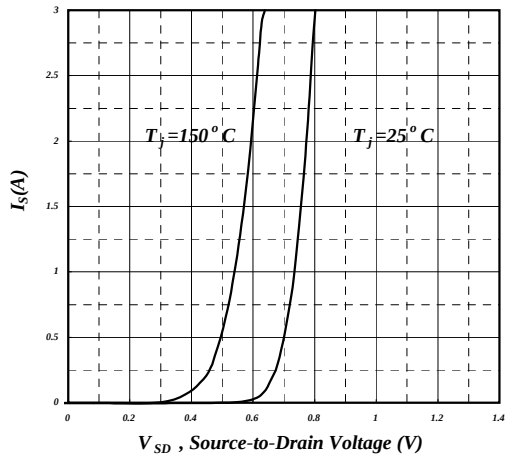


Fig 5. Forward Characteristic of Reverse Diode

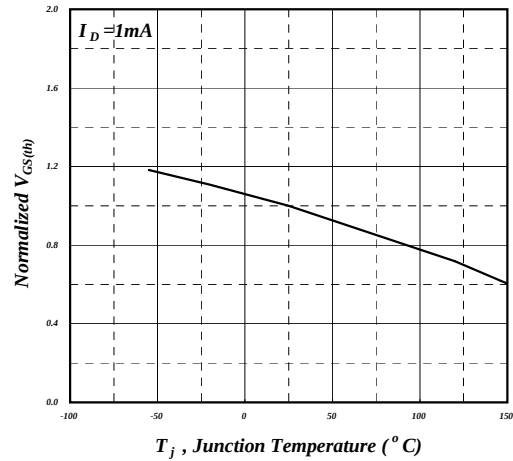


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

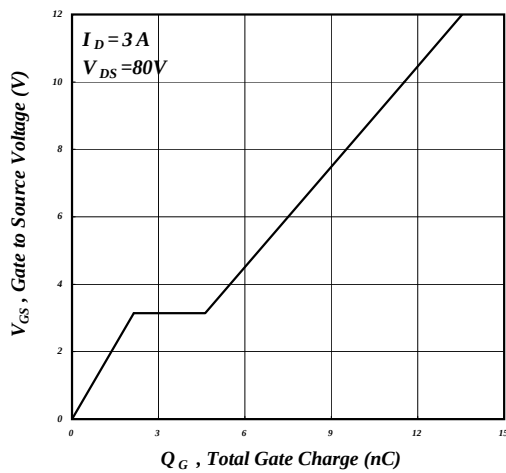


Fig 7. Gate Charge Characteristics

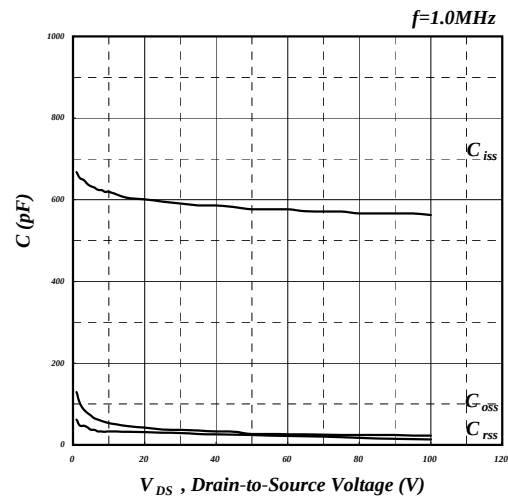


Fig 8. Typical Capacitance Characteristics

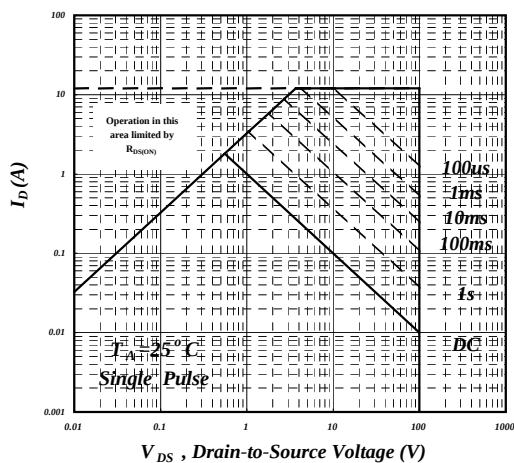


Fig 9. Maximum Safe Operating Area

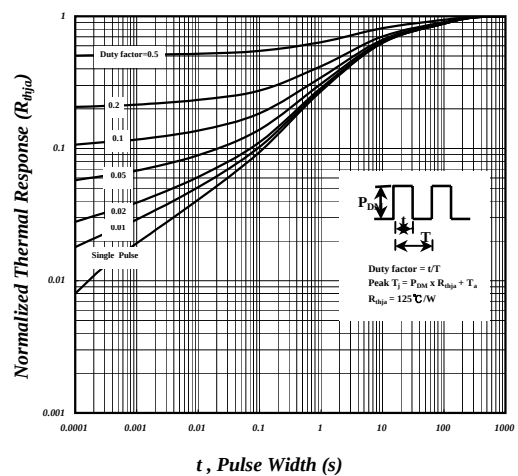


Fig 10. Effective Transient Thermal Impedance

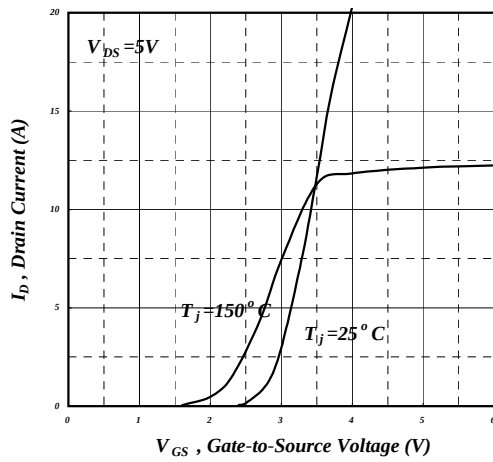


Fig 11. Transfer Characteristics

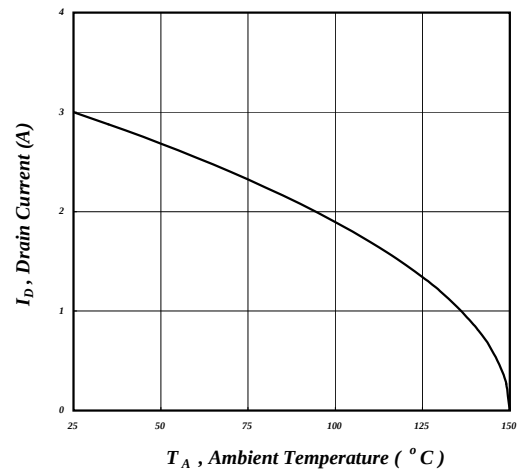


Fig 12. Drain Current v.s. Ambient Temperature

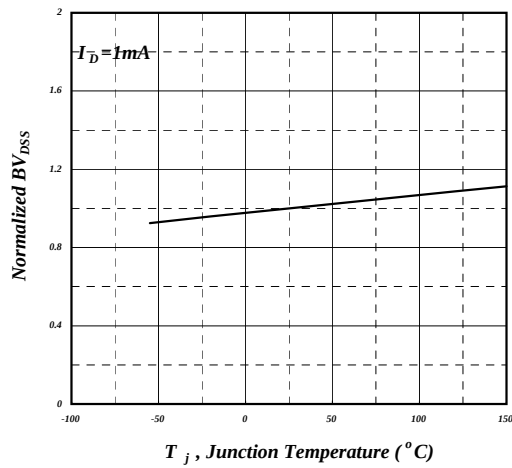


Fig 13. Normalized BV_{DS} v.s. Junction Temperature

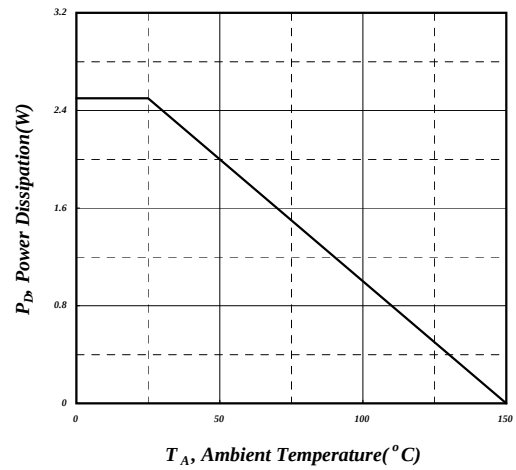


Fig 14. Total Power Dissipation

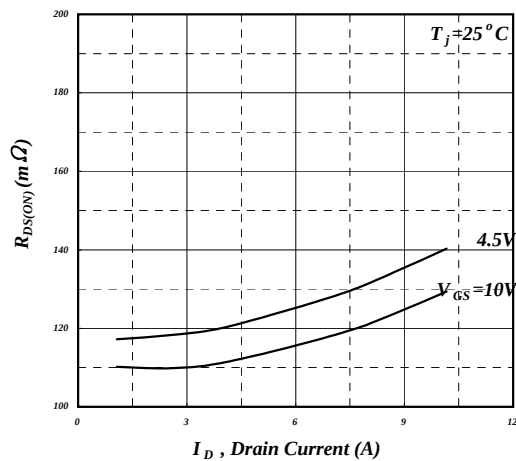
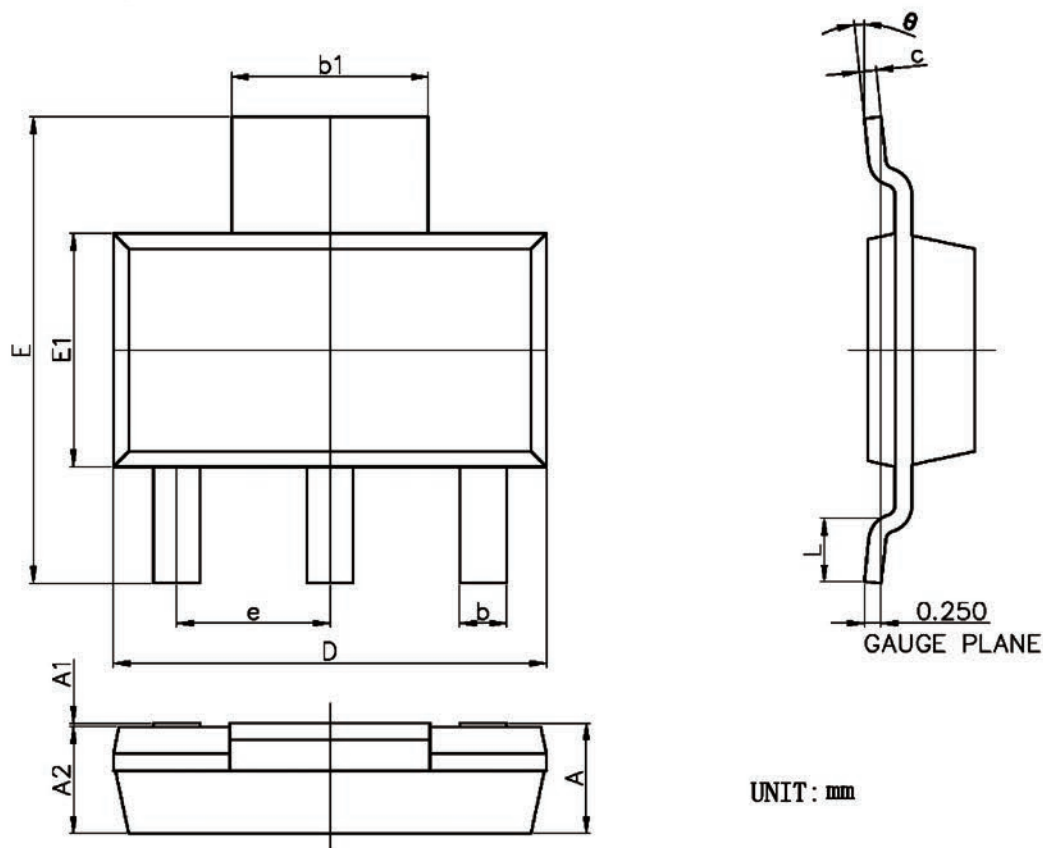


Fig 15. Typ. Drain-Source on State Resistance

Sot-223Package Outline Data

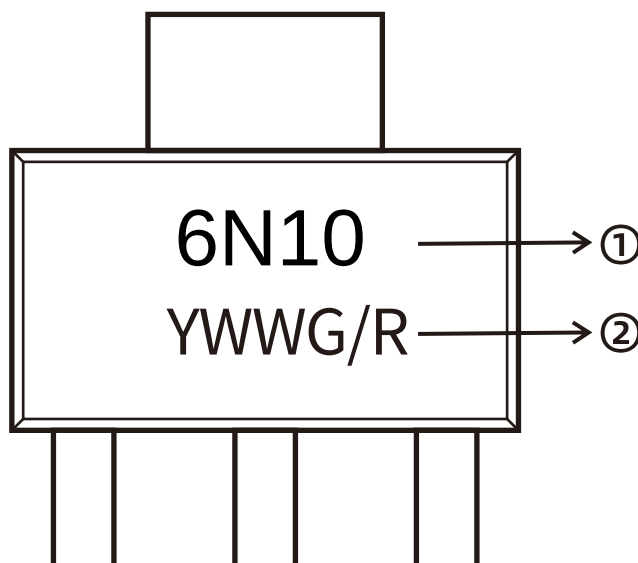


UNIT: mm

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	—	1.800	—	0.071
A1	0.020	0.100	0.001	0.004
A2	1.500	1.700	0.059	0.067
b	0.660	0.840	0.026	0.033
b_1	2.900	3.100	0.114	0.122
c	0.230	0.350	0.009	0.014
D	6.300	6.700	0.248	0.264
E	6.700	7.300	0.264	0.287
E_1	3.300	3.700	0.130	0.146
e	2.300(BSC)		0.091(BSC)	
L	0.750	—	0.030	—
θ	0°	10°	0°	10°

Marking Information:

- ①: Part NO.
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)



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