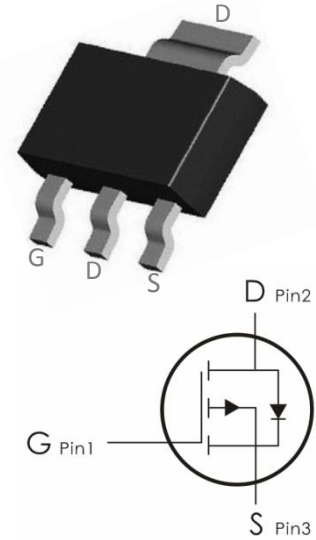


Description:

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) $V_{DS}=-60V, I_D=-3A, R_{DS(ON)}<180m\ \Omega @V_{GS}=-10V$
- 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
TE180PG-S	E180P-S	SOT-223	4000 pcs/Reel

Absolute Maximum Ratings: ($T_A=25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Ratings	Units
V_{DS}	Drain-Source Voltage	-60	V
V_{GS}	Gate-Source Voltage	± 20	V
I_D	Continuous Drain Current- $T_A=25^\circ\text{C}$	-3	A
	Continuous Drain Current- $T_A=70^\circ\text{C}$	-1.8	
I_{DM}	Pulsed Drain Current ¹	-12	
P_D	Power Dissipation ³	1.5	W
T_J, T_{STG}	Operating and Storage Junction Temperature Range	-55-+150	$^\circ\text{C}$

Thermal Characteristics:

Symbol	Parameter	Max	Units
$R_{\theta JC}$	Thermal Resistance, Junction to Case ¹	48	$^\circ\text{C}/\text{W}$
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient ¹	85	$^\circ\text{C}/\text{W}$

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

Symbol	Parameter	Conditions	Min	Typ	Max	Units
Off Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=250\ \mu\text{A}$	-60	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	$V_{GS}=0V, V_{DS}=-60V$	---	---	-1	μA
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 20V, V_{DS}=0A$	---	---	± 100	nA
On Characteristics						
$V_{GS(th)}$	GATE-Source Threshold Voltage	$V_{GS}=V_{DS}, I_D=250\ \mu\text{A}$	-1	-16	-2.5	V
$R_{DS(ON)}$	Drain-Source On Resistance ³	$V_{GS}=-10V, I_D=-1.5A$	---	155	180	$\text{m}\Omega$
		$V_{GS}=-4.5V, I_D=-1A$	---	175	210	$\text{m}\Omega$
Dynamic Characteristics						
C_{iss}	Input Capacitance ⁴	$V_{DS}=-30V, V_{GS}=0V, f=1\text{MHz}$	---	495	---	pF
C_{oss}	Output Capacitance ⁴		---	27	--	
C_{rss}	Reverse Transfer Capacitance ⁴		---	20	---	
Switching Characteristics						
$t_{d(on)}$	Turn-On Delay Time ⁴	$V_{DS}=-30V, I_D=-1.5A,$ $R_{ENG}=3\ \Omega, V_{GS}=-10V$	---	18.9	---	ns
t_r	Rise Time ⁴		---	36.7	---	ns
$t_{d(off)}$	Turn-Off Delay Time ⁴		---	5.3	---	ns
t_f	Fall Time ⁴		---	3.4	---	ns
Q_g	Total Gate Charge ⁴	$V_{GS}=-10V, V_{DS}=-30V,$ $I_D=-1.5A$	---	15.7	---	nc
Q_{gs}	Gate-Source Charge ⁴		---	2.7	---	nc
Q_{gd}	Gate-Drain "Miller" Charge ⁴		---	1	---	nc
Drain-Source Diode Characteristics						
V_{SD}	Diode Forward Voltage ²	$V_{GS}=0V, I_{SD}=-1A$	---	---	-1.2	V
I_S	Continuous Drain Current ^{1,4}	$V_D=V_G=0V$	---	---	-3	A
I_{SM}	Pulsed Drain Current ^{2,4}		---	---	-12	A

Notes:

1. Repetitive rating, pulse width limited by junction temperature $T_{J(MAX)}=150^\circ\text{C}$.

2. The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper, The value in any given application depends on the user's specific board design.
3. Pulse Test: Pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$.
4. This value is guaranteed by design hence it is not included in the production test.

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

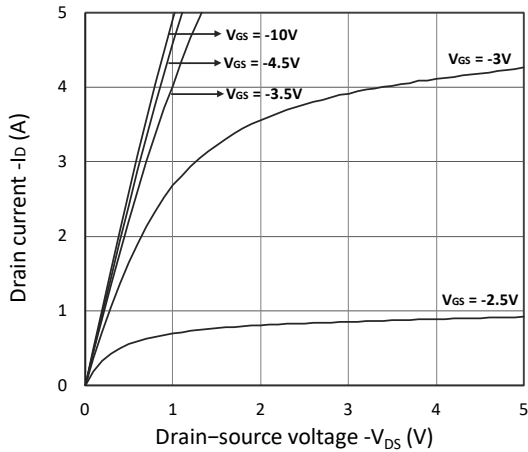


Figure 1. Output Characteristics

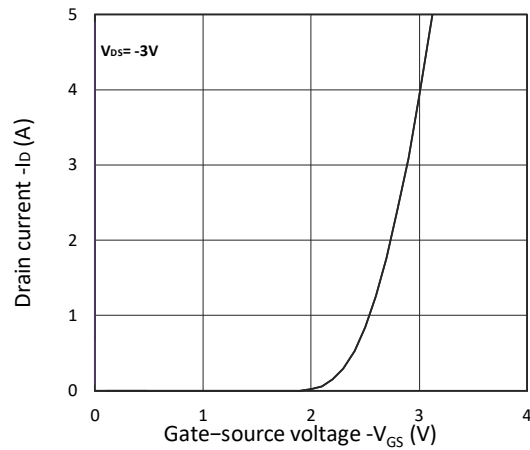


Figure 2. Transfer Characteristics

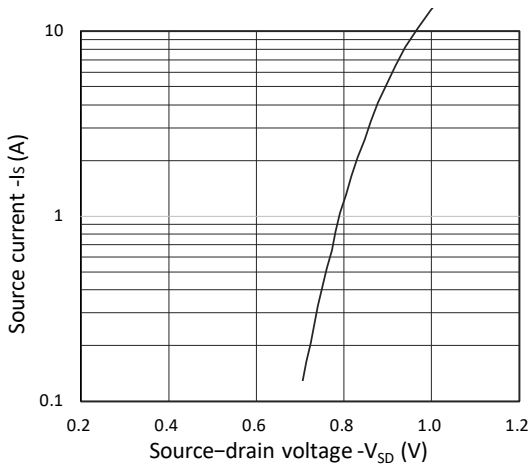


Figure 3. Forward Characteristics of Reverse

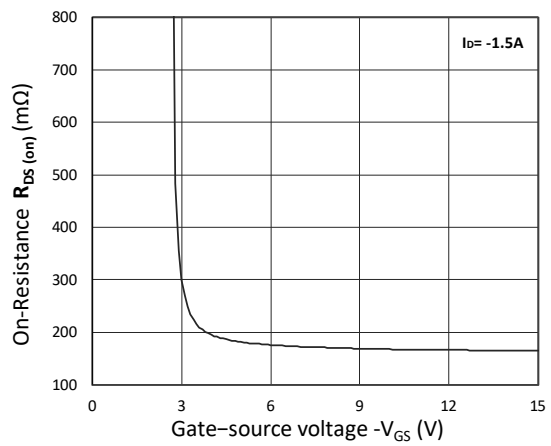


Figure 4. $R_{DS(ON)}$ vs. V_{GS}

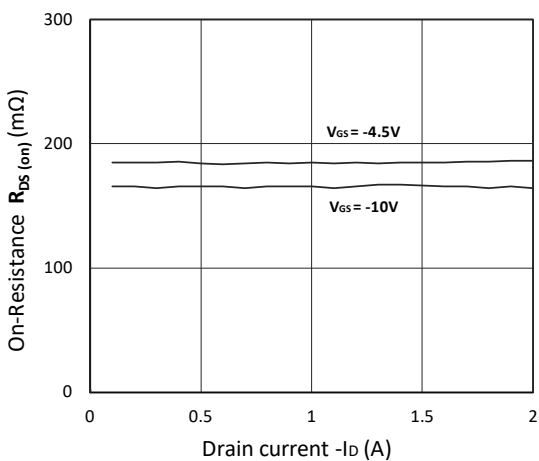


Figure 5. $R_{DS(ON)}$ vs. I_D

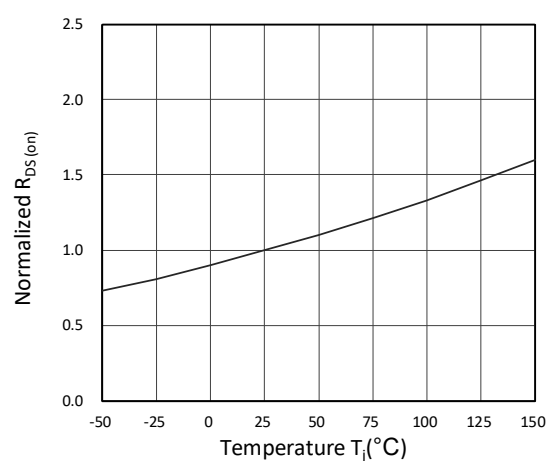


Figure 6. Normalized $R_{DS(ON)}$ vs. Temperature

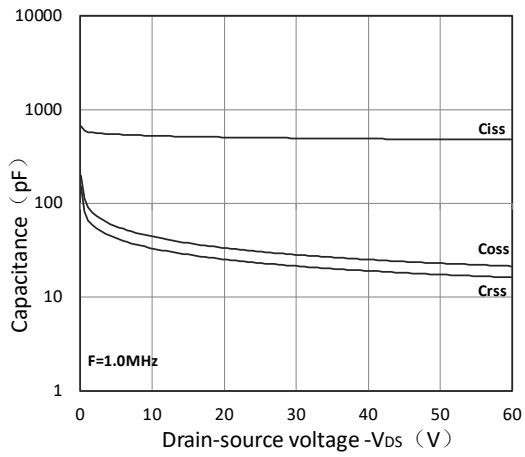


Figure 7. Capacitance Characteristics

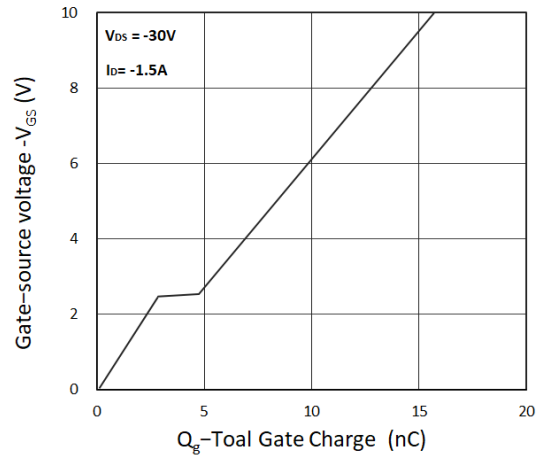
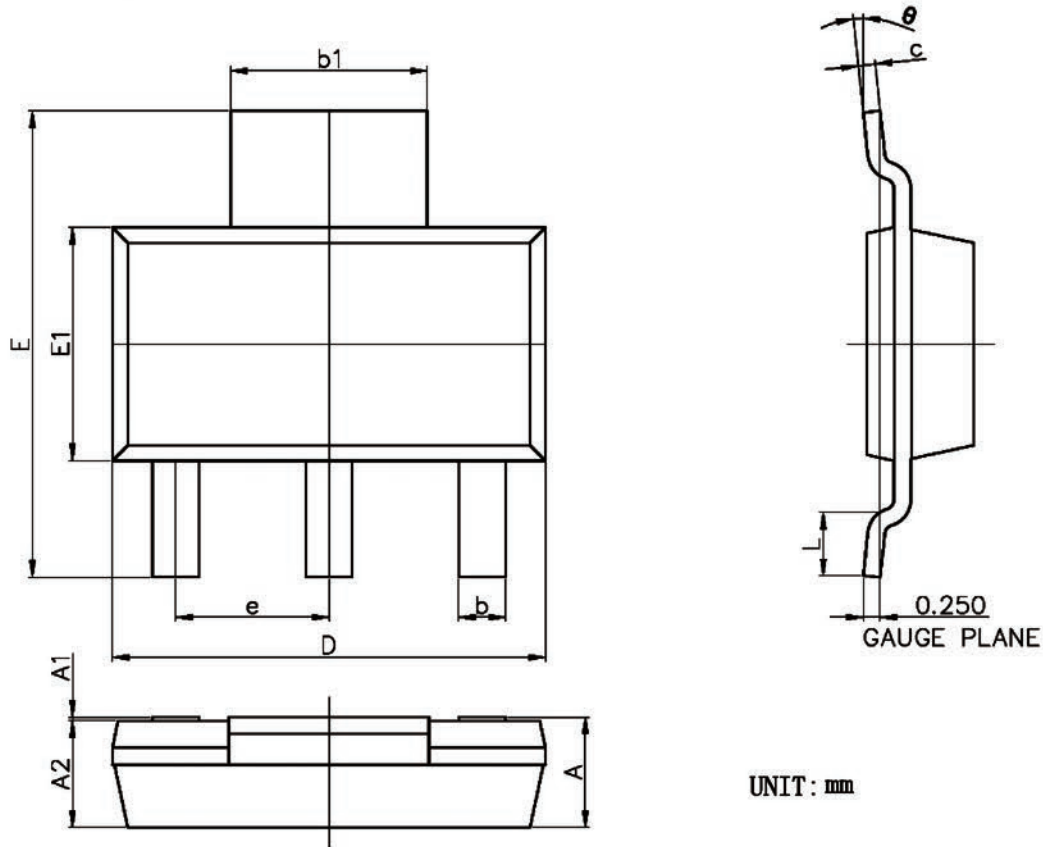


Figure 8. Gate Charge Characteristics

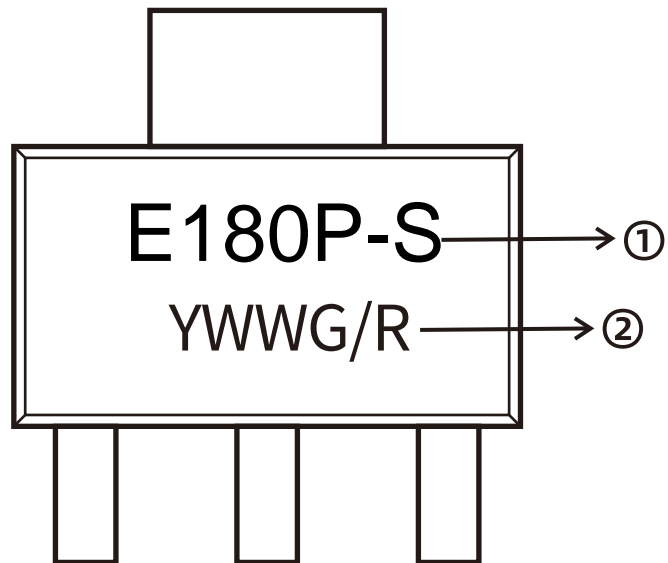
Sot-223 Package Outline Data




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
b1	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
E1	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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