

- ★ Green Device Available
- ★ Super Low Gate Charge
- ★ Excellent CdV/dt effect decline
- ★ Advanced high cell density Trench technology

Product Summary



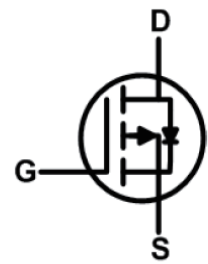
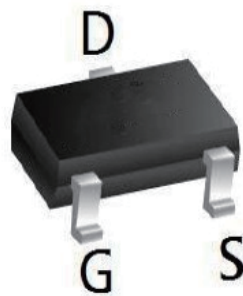
BVDSS	R _{DS(on)}	I _D
-20V	20mΩ	-6.0A

Description

The 20P07 is the high cell density trenched P-ch MOSFETs, which provide excellent R_{DS(on)} and efficiency for most of the small power switching and load switch applications.

The 20P07 meet the RoHS and Green Product requirement with full function reliability approved.

SOT23-3L Pin Configuration



Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V _{DS}	Drain-Source Voltage	-20	V
V _{GS}	Gate-Source Voltage	±12	V
I _{D@TA=25°C}	Continuous Drain Current, V _{GS} @ 10V ¹	-6.0	A
I _{D@TA=70°C}	Continuous Drain Current, V _{GS} @ 10V ¹	-4.8	A
I _{DM}	Pulsed Drain Current ²	-18.8	A
P _{D@TA=25°C}	Total Power Dissipation ³	1	W
T _{STG}	Storage Temperature Range	-55 to 150	°C
T _J	Operating Junction Temperature Range	-55 to 150	°C

Thermal Data

Symbol	Parameter	Typ.	Max.	Unit
R _{θJA}	Thermal Resistance Junction-Ambient ¹	---	125	°C/W
R _{θJC}	Thermal Resistance Junction-Case ¹	---	80	°C/W

Electrical Characteristics ($T_J = 25^\circ\text{C}$ unless otherwise specified)

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\mu A$	-20	---	---	V
$\Delta BV_{DSS}/\Delta T_J$	BV_{DSS} Temperature Coefficient	Reference to 25°C , $I_D=-1mA$	---	-0.01	---	$V/^\circ\text{C}$
$R_{DS(ON)}$	Static Drain-Source On-Resistance ²	$V_{GS}=-4.5V, I_D=-6.5A$	---	21	27	m Ω
		$V_{GS}=-2.5V, I_D=-5A$	---	29	39	
		$V_{GS}=-1.8V, I_D=-1.5A$	---	---	---	
$V_{GS(th)}$	Gate Threshold Voltage	$V_{GS}=V_{DS}, I_D=-250\mu A$	-0.6	-0.8	-1.4	V
$\Delta V_{GS(th)}$	$V_{GS(th)}$ Temperature Coefficient		---	---	---	$mV/^\circ\text{C}$
I_{DSS}	Drain-Source Leakage Current	$V_{DS}=-20V, V_{GS}=0V, T_J=25^\circ\text{C}$	---	---	1	uA
		$V_{DS}=-16V, V_{GS}=0V, T_J=55^\circ\text{C}$	---	---	---	
I_{GSS}	Gate-Source Leakage Current	$V_{GS}=\pm 12V, V_{DS}=0V$	---	---	± 100	nA
g_{fs}	Forward Transconductance	$V_{DS}=-5V, I_D=-3A$	---	10	---	S
Q_g	Total Gate Charge (-4.5V)	$V_{DS}=-10V, V_{GS}=-4.5V, I_D=-6.5A$	---	10	---	nC
Q_{gs}	Gate-Source Charge		---	1.5	---	
Q_{gd}	Gate-Drain Charge		---	3	---	
$T_{d(on)}$	Turn-On Delay Time	$V_{DD}=-10V, V_{GS}=-4.5V, R_G=6\Omega, I_D=-1A$	---	30	---	ns
T_r	Rise Time		---	25	---	
$T_{d(off)}$	Turn-Off Delay Time		---	70	---	
T_f	Fall Time		---	50	---	
C_{iss}	Input Capacitance	$V_{DS}=-10V, V_{GS}=0V, f=1MHz$	---	1210	---	pF
C_{oss}	Output Capacitance		---	310	---	
C_{rss}	Reverse Transfer Capacitance		---	290	---	

Diode Characteristics

Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
I_S	Continuous Source Current ^{1,4}	$V_G=V_D=0V$, Force Current	---	---	-6	A
I_{SM}	Pulsed Source Current ^{2,4}		---	---	-18.8	A
V_{SD}	Diode Forward Voltage ²	$V_{GS}=0V, I_S=-1A, T_J=25^\circ\text{C}$	---	---	-1	V
t_{rr}	Reverse Recovery Time	$I_F=-4A, dI/dt=100A/\mu s, T_J=25^\circ\text{C}$	---	52	---	nS
Q_{rr}	Reverse Recovery Charge		---	28	---	nC

Note :

1.The data tested by surface mounted on a 1 inch² FR-4 board with 2OZ copper.

2.The data tested by pulsed, pulse width $\leq 300\mu s$, duty cycle $\leq 2\%$

3. The power dissipation is limited by 150°C junction temperature

4. The data is theoretically the same as I_D and I_{DM} , in real applications, should be limited by total power dissipation.

Typical Performance Characteristics

Figure 1: Output Characteristics

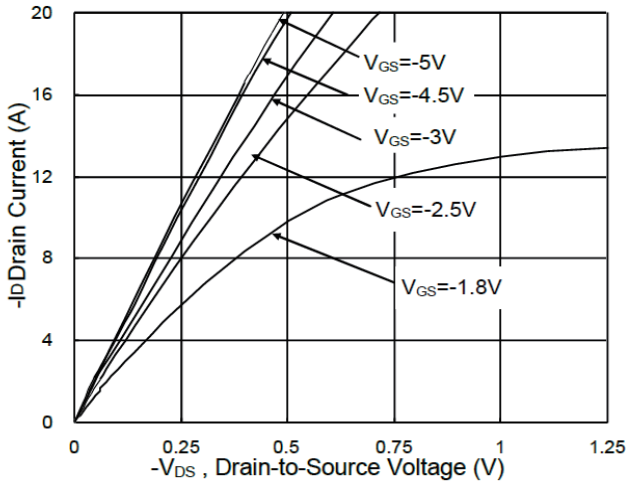


Figure 2: On-Resistance vs. Gate-Source Voltage

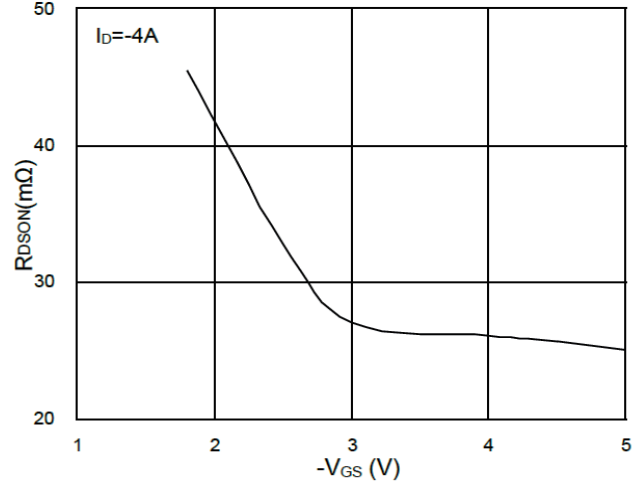


Figure 3: Forward Characteristics of Reverse

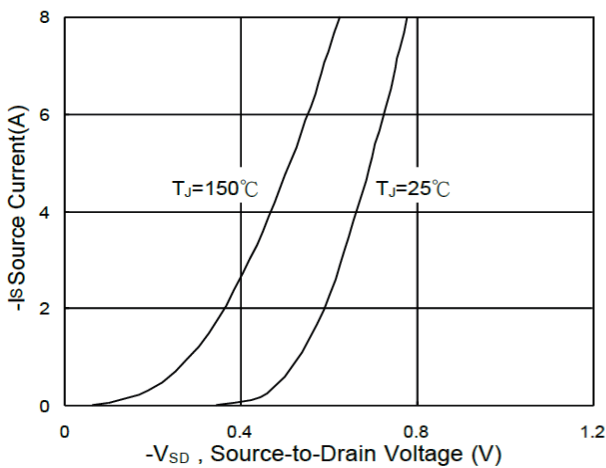


Figure 4: Gate-Charge Characteristics

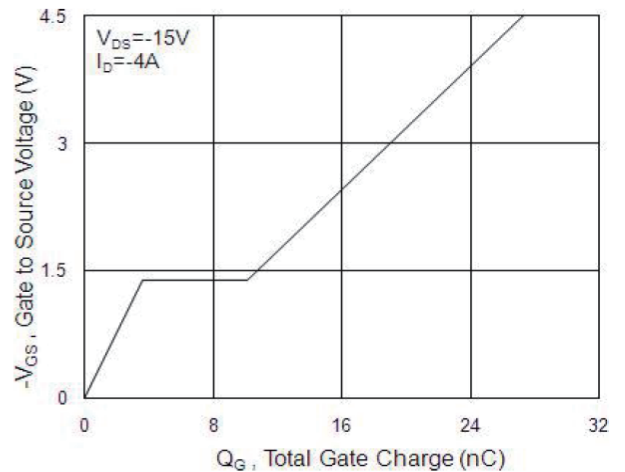


Figure 5: Normalized VGS(th) vs. TJ

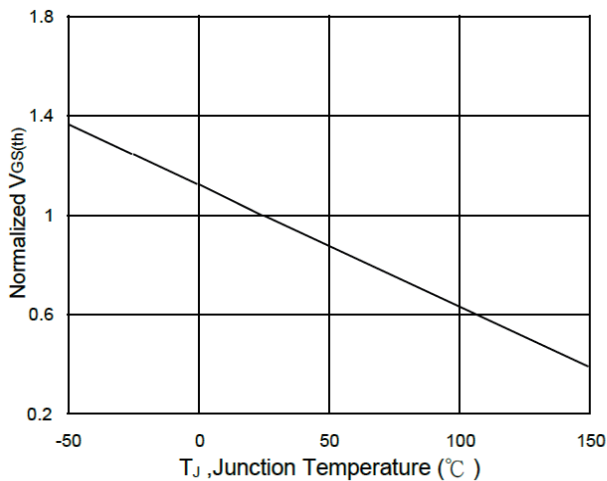
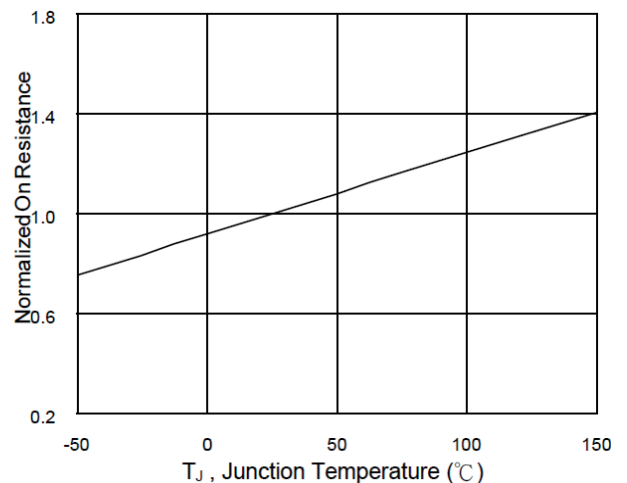


Figure 6: Normalized RDS(on) vs. TJ



Typical Performance Characteristics

Figure 7: Capacitance Temperature

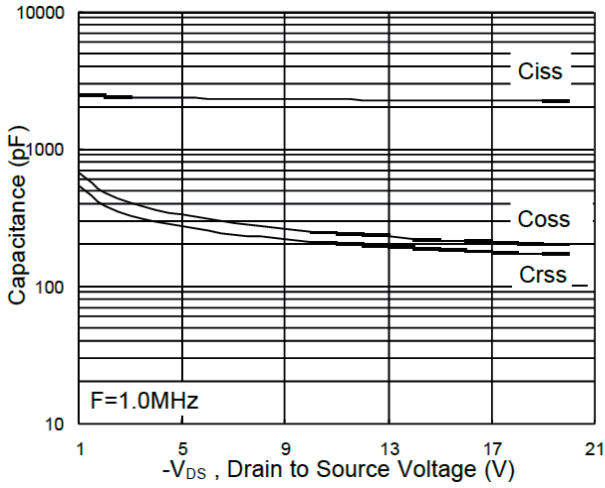


Figure 8: Safe Operating Area

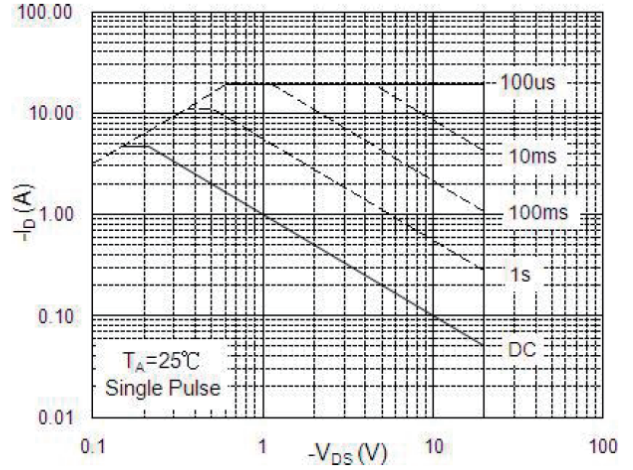


Figure 9: Normalized Maximum Transient

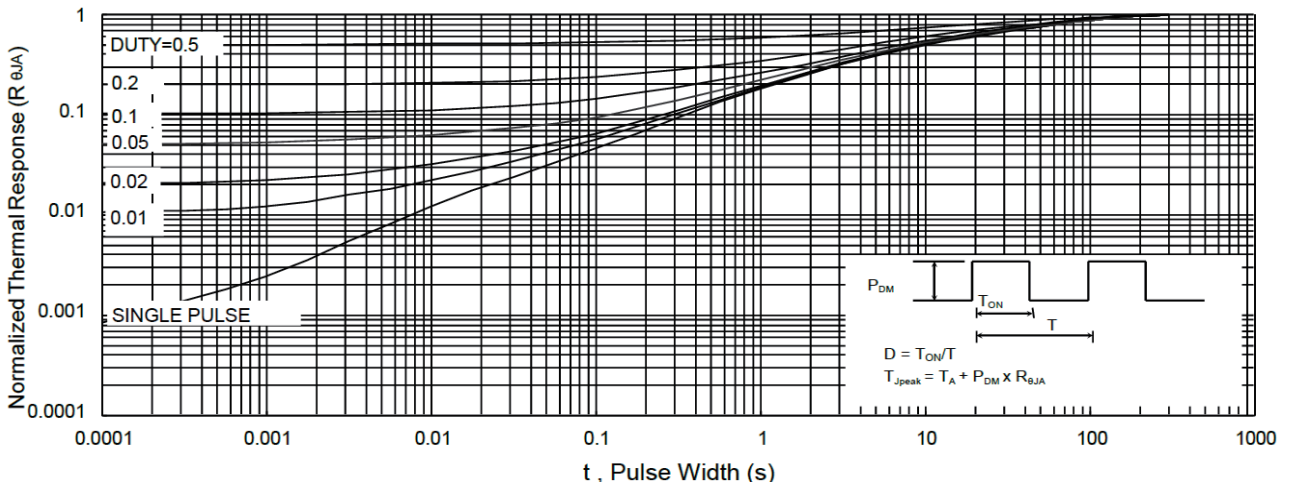


Figure 10: Switching Time Waveform

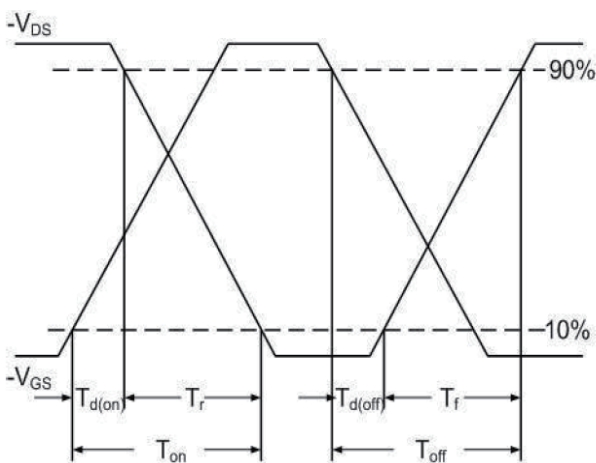
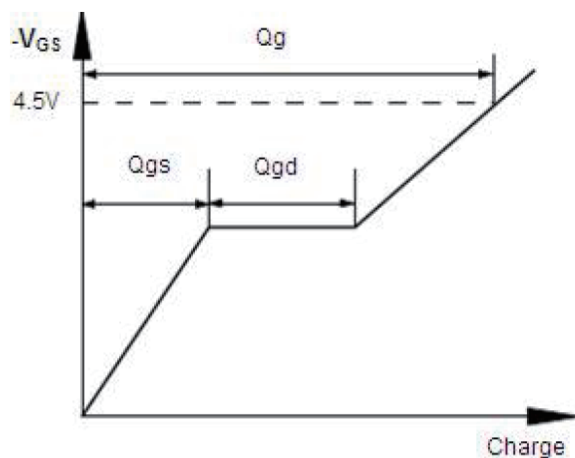
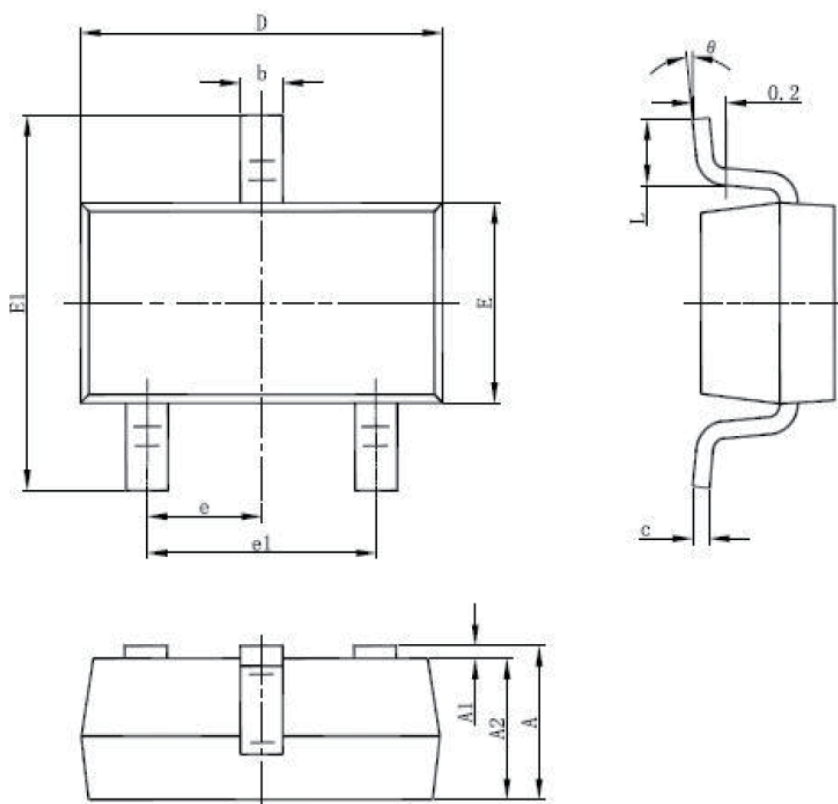


Figure.11: Gate Charge Waveform



SOT-23-3L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.05	1.25	0.041	0.049
A1	0.00	0.10	0.000	0.004
A2	1.05	1.15	0.041	0.045
b	0.30	0.50	0.012	0.02
c	0.10	0.20	0.004	0.008
D	2.82	3.02	0.111	0.119
E	1.50	1.70	0.059	0.067
E1	2.65	2.95	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
L	0.30	0.60	0.012	0.024
θ	0°	8°	0°	8°