



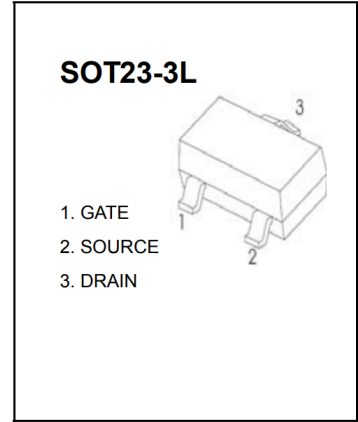
P-Channel Advanced Power MOSFET

Features

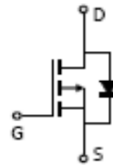
- -20V/-5A,
 $R_{DS(ON)} = 20m\Omega(Typ.)@V_{GS} = -4.5V$
 $R_{DS(ON)} = 30m\Omega(Typ.)@V_{GS} = -2.5V$
- Low On-Resistance
- Super High Dense Cell Design
- Reliable and Rugged
- Lead Free and Green Devices Available (RoHS Compliant)

Applications

- Load Switch
- Power Management
- Battery Protection



Marking ; 20P7



Absolute Maximum Ratings

Symbol	Parameter	Rating	Unit
Common Ratings ($T_A = 25^\circ C$ Unless Otherwise Noted)			
V_{DSS}	Drain-Source Voltage	-20	V
V_{GSS}	Gate-Source Voltage	± 10	
T_J	Maximum Junction Temperature	150	$^\circ C$
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ C$
I_S	Diode Continuous Forward Current	$T_A = 25^\circ C$ -1	A
Mounted on Large Heat Sink			
$I_{DP}^{①}$	300 μs Pulse Drain Current Tested	$T_A = 25^\circ C$ -20	A
$I_D^{②}$	Continuous Drain Current ($V_{GS} = -10V$)	$T_A = 25^\circ C$ -5	A
		$T_A = 70^\circ C$ -3.1	
P_D	Maximum Power Dissipation	$T_A = 25^\circ C$ 1.3	W
		$T_A = 70^\circ C$ 0.8	
$R_{\theta JC}$	Thermal Resistance-Junction to Case	-	$^\circ C/W$
$R_{\theta JA}^{③}$	Thermal Resistance-Junction to Ambient	100	$^\circ C/W$
Drain-Source Avalanche Ratings			
$E_{AS}^{④}$	Avalanche Energy, Single Pulsed	-	mJ



Electrical Characteristics (T_A=25°C Unless Otherwise Noted)

Symbol	Parameter	Test Condition	RU20P7C			Unit
			Min.	Typ.	Max.	
Static Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _{DS} =-250μA	-20			V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =-20V, V _{GS} =0V			-1	μA
		T _J =125°C			-30	
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _{DS} =-250μA	-0.4	-0.7	-1.1	V
I _{GSS}	Gate Leakage Current	V _{GS} =±10V, V _{DS} =0V			±100	nA
R _{DS(ON)} ^⑤	Drain-Source On-state Resistance	V _{GS} =-4.5V, I _{DS} =-5A		20	28	mΩ
		V _{GS} =-2.5V, I _{DS} =-4A		30	38	mΩ
Diode Characteristics						
V _{SD} ^⑤	Diode Forward Voltage	I _{SD} =-1A, V _{GS} =0V			-1.2	V
t _{rr}	Reverse Recovery Time	I _{SD} =-5A, dI _{SD} /dt=100A/μs		17		ns
Q _{rr}	Reverse Recovery Charge			23		nC
Dynamic Characteristics ^⑥						
R _G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, F=1MHz		0.9		Ω
C _{iss}	Input Capacitance	V _{GS} =0V, V _{DS} =-10V, Frequency=1.0MHz		640		pF
C _{oss}	Output Capacitance			135		
C _{rss}	Reverse Transfer Capacitance			65		
t _{d(ON)}	Turn-on Delay Time	V _{DD} =-10V, R _L =3.8Ω, I _{DS} =-5A, V _{GEN} =-4.5V, R _G =6Ω		9		ns
t _r	Turn-on Rise Time			16		
t _{d(OFF)}	Turn-off Delay Time			45		
t _f	Turn-off Fall Time			21		
Gate Charge Characteristics ^⑥						
Q _g	Total Gate Charge	V _{DS} =-16V, V _{GS} =-10V, I _{DS} =-5A		10		nC
Q _{gs}	Gate-Source Charge			2		
Q _{gd}	Gate-Drain Charge			3		

- Notes:
- ① Pulse width limited by safe operating area.
 - ② Calculated continuous current based on maximum allowable junction temperature.
 - ③ When mounted on 1 inch square copper board, t ≤ 10sec. The value in any given application depends on the user's specific board design.
 - ④ Limited by T_{Jmax}. Starting T_J = 25°C.
 - ⑤ Pulse test; Pulse width ≤ 300μs, duty cycle ≤ 2%.
 - ⑥ Guaranteed by design, not subject to production testing.



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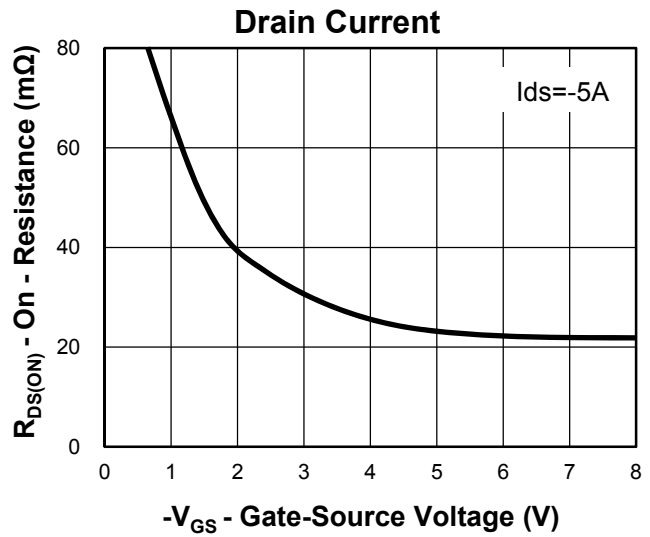
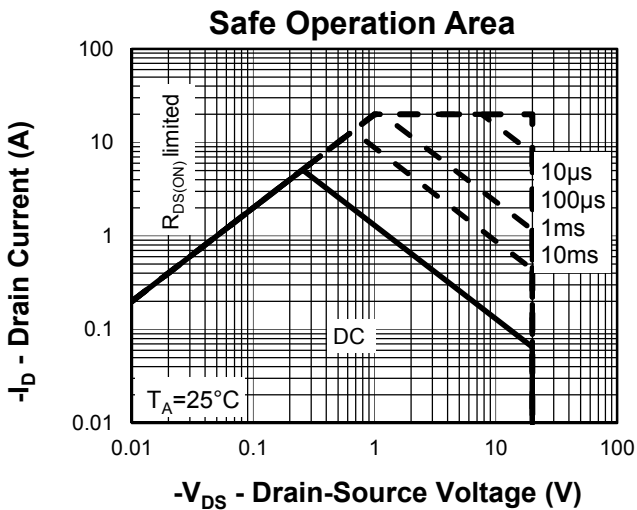
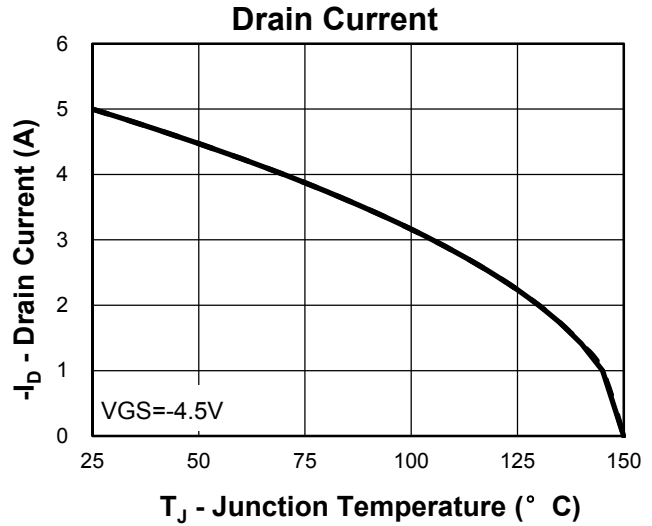
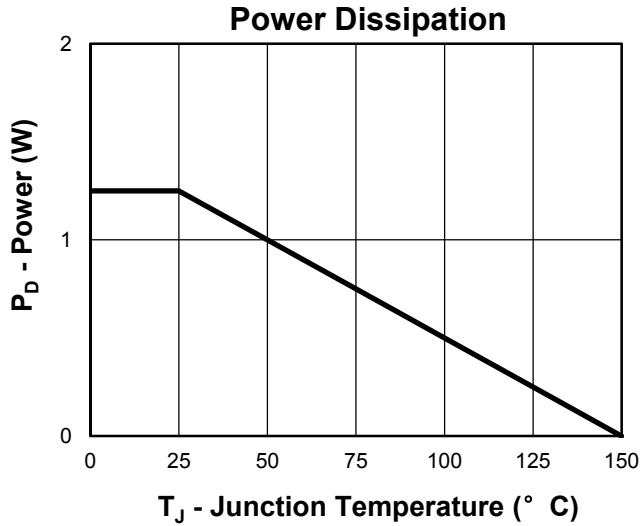
SOT-23-3L

CB20P7C

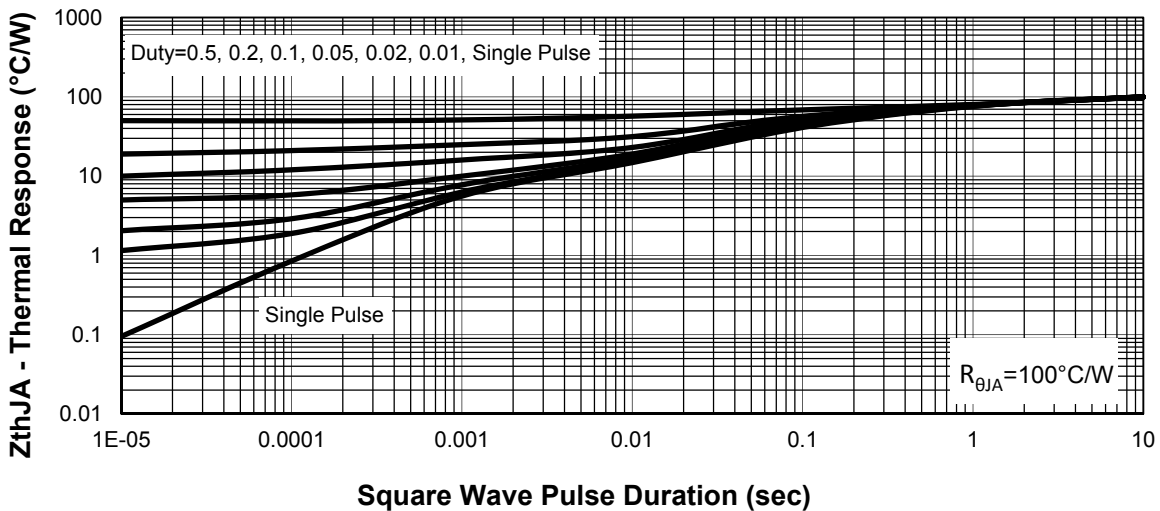


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Typical Characteristics

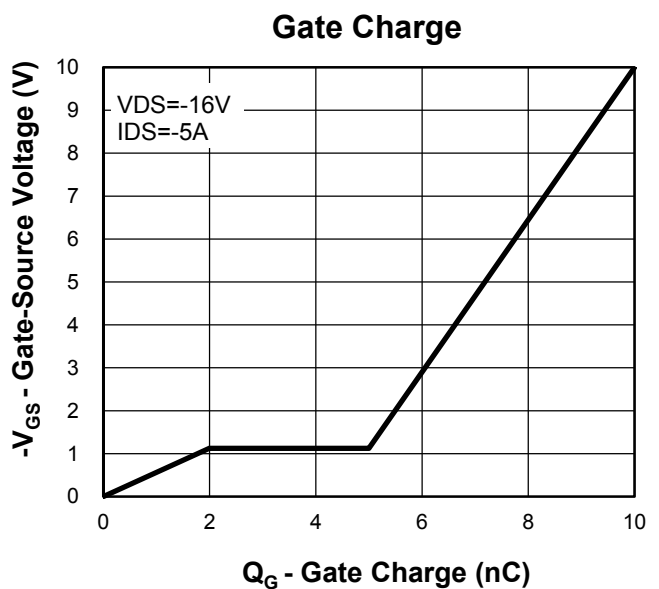
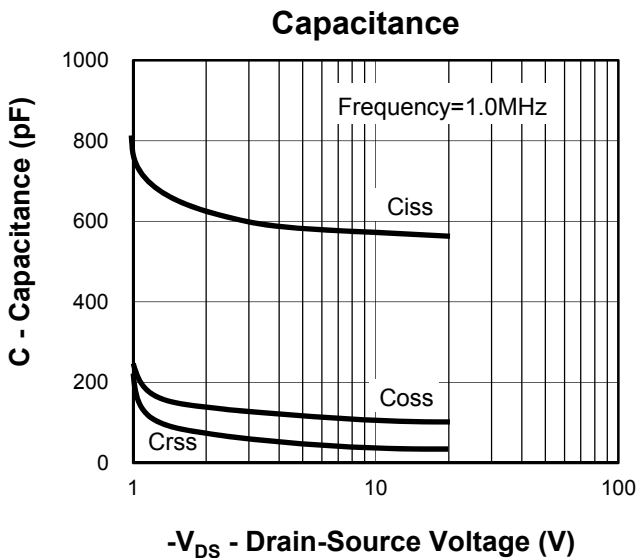
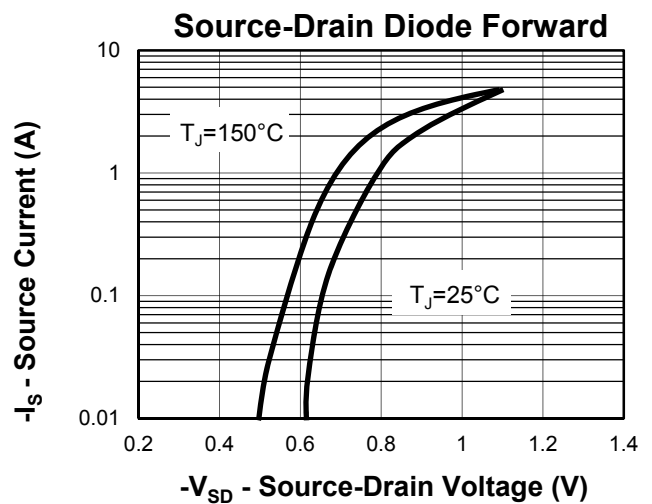
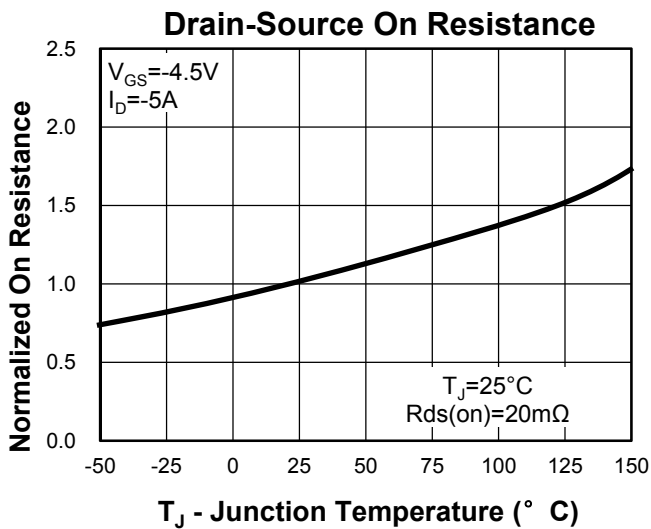
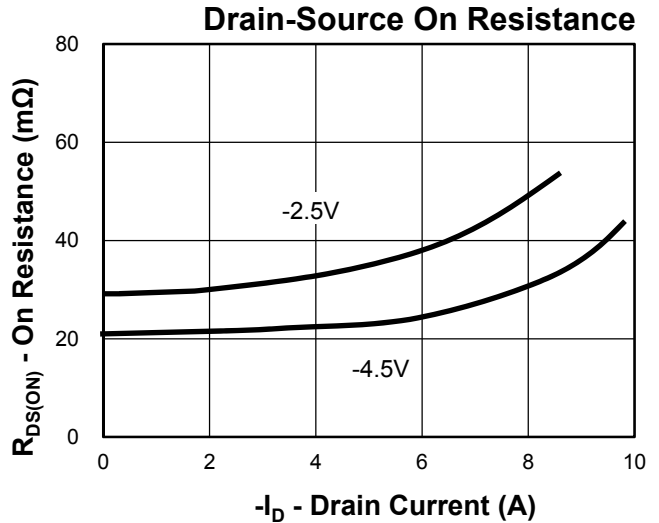
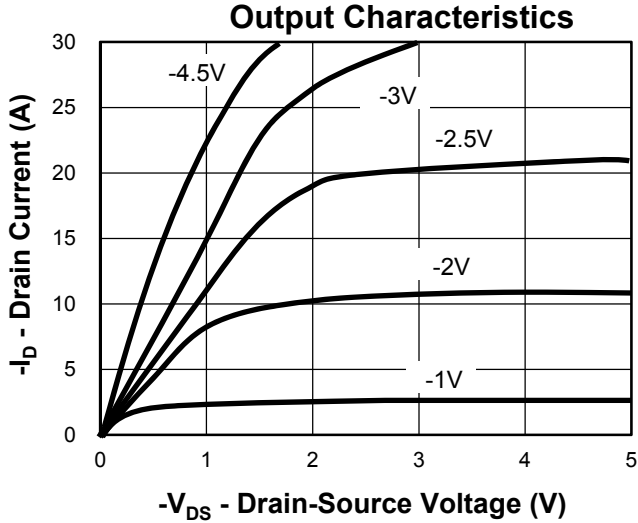


Thermal Transient Impedance

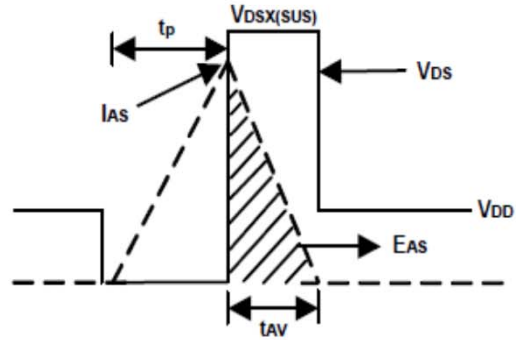
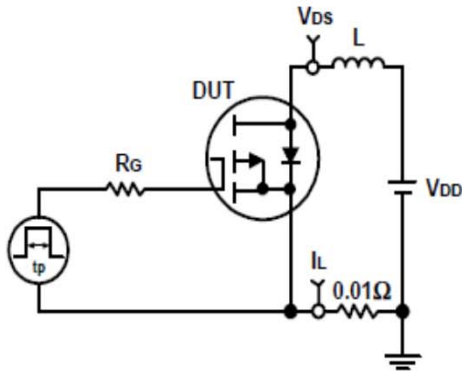




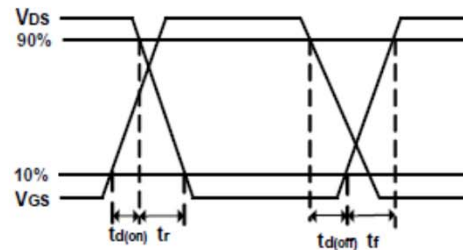
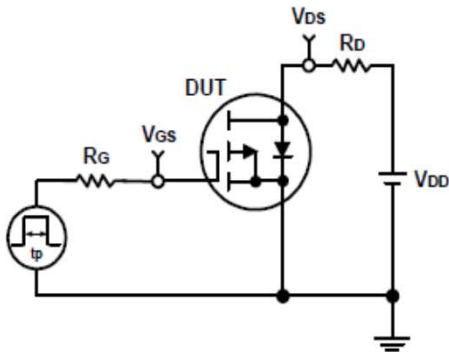
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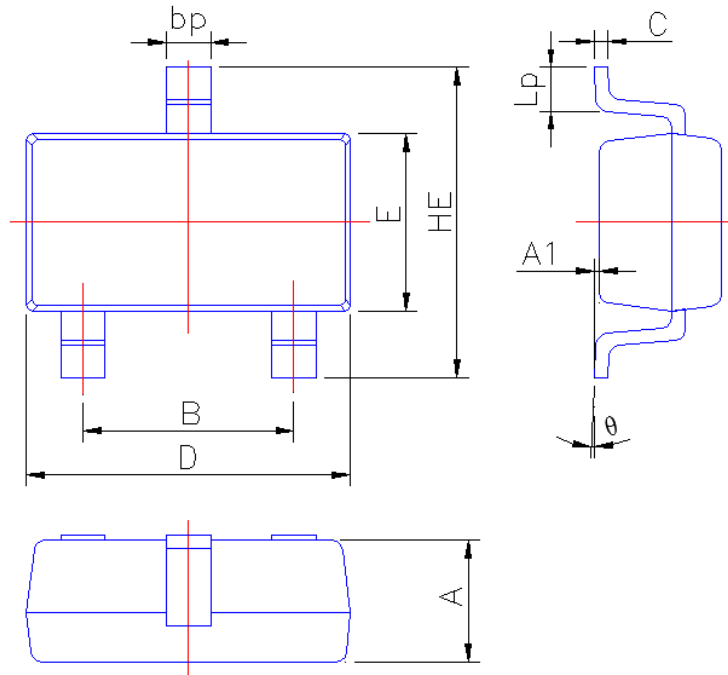
Avalanche Test Circuit and Waveforms



Switching Time Test Circuit and Waveforms



SOT-23-3L Package Outline Dimensions



Symbol	Dimension in Millimeters	
	Min	Max
A	1.05	1.20
A1	0.010	0.100
B	1.80	2.00
bp	0.35	0.50
C	0.09	0.15
D	2.80	3.00
E	1.50	1.70
HE	2.60	3.00
Lp	0.25	0.55
θ	2°	6°