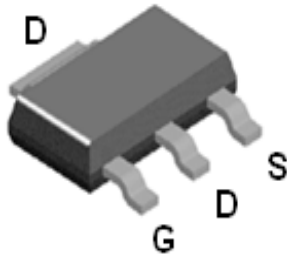


# P7006BL

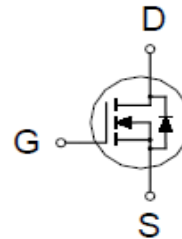
## N-Channel Enhancement Mode MOSFET

### PRODUCT SUMMARY

$V_{(BR)DSS}$	$R_{DS(ON)}$	$I_D$
60V	70mΩ @ $V_{GS} = 10V$	3.8A



SOT-223



### ABSOLUTE MAXIMUM RATINGS ( $T_A = 25\text{ °C}$ Unless Otherwise Noted)

PARAMETERS/TEST CONDITIONS	SYMBOL	LIMITS	UNITS
Gate-Source Voltage	$V_{GS}$	±20	V
Continuous Drain Current	$I_D$	$T_A = 25\text{ °C}$	3.8
		$T_A = 70\text{ °C}$	3
Pulsed Drain Current <sup>1, 2</sup>	$I_{DM}$	25	A
Avalanche Current	$I_{AS}$	16	
Avalanche Energy <sup>3</sup>	$E_{AS}$	12.8	mJ
Power Dissipation	$P_D$	$T_A = 25\text{ °C}$	2
		$T_A = 70\text{ °C}$	1.3
Operating Junction & Storage Temperature Range	$T_J, T_{stg}$	-55 to 150	°C

### THERMAL RESISTANCE RATINGS

THERMAL RESISTANCE	SYMBOL	TYPICAL	MAXIMUM	UNITS
Junction-to-Ambient <sup>2</sup>	$R_{\theta JA}$		60	°C / W

<sup>1</sup>Pulse width limited by maximum junction temperature.

<sup>2</sup>The value of  $R_{\theta JA}$  is measured with the device mounted on 1in<sup>2</sup> FR-4 board with 2oz. Copper, in a still air environment with  $T_A = 25\text{ °C}$ .

<sup>3</sup> $L = 0.1\text{mH}$ ,  $I_{AS} = 16\text{A}$ ,  $V_{DD} = 50\text{V}$ ,  $R_G = 25\text{ }\Omega$ , Starting  $T_J = 25\text{ °C}$ .

## **P7006BL** **N-Channel Enhancement Mode MOSFET**

### **ELECTRICAL CHARACTERISTICS (T<sub>J</sub> = 25 °C, Unless Otherwise Noted)**

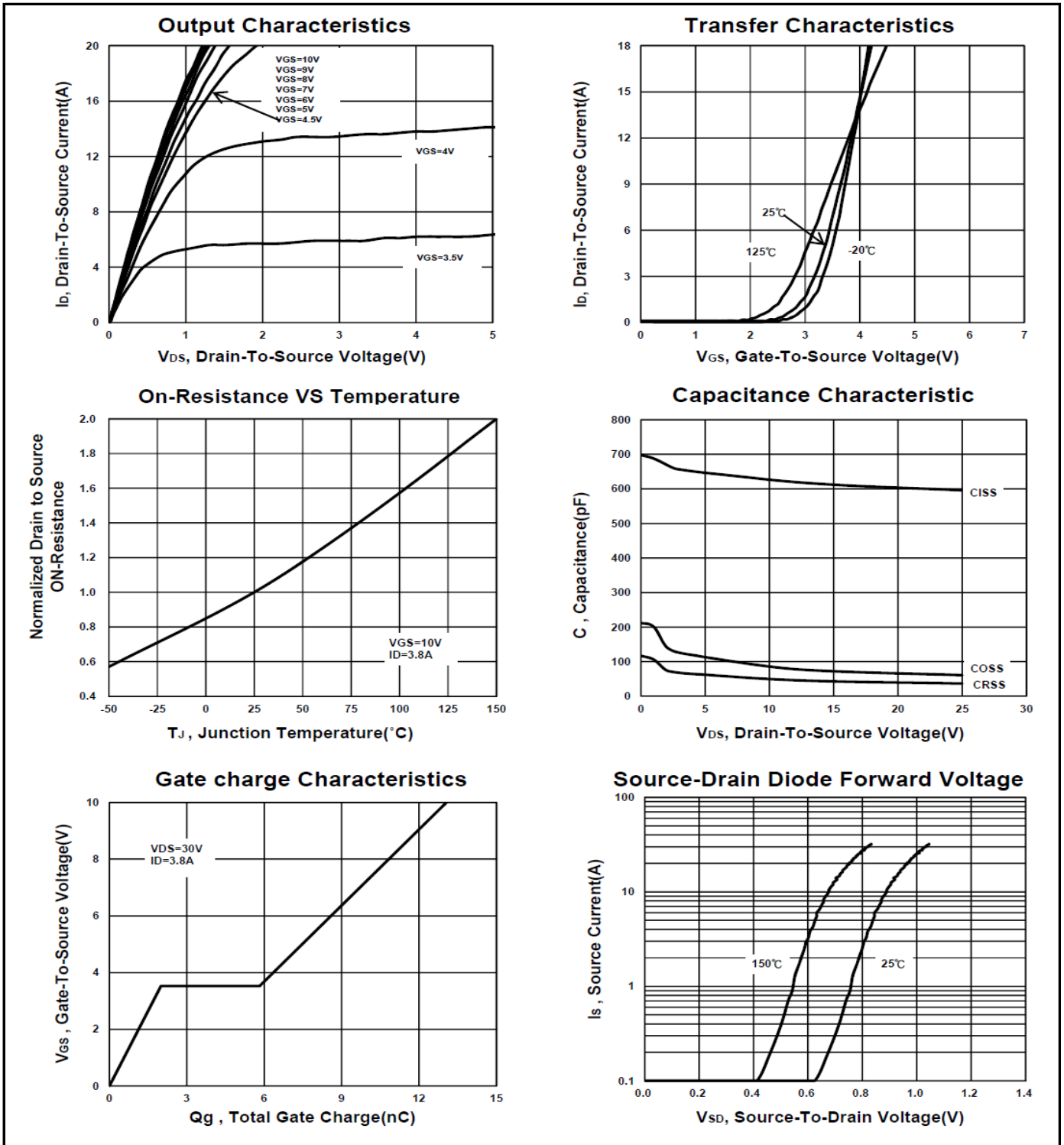
PARAMETER	SYMBOL	TEST CONDITIONS	LIMIT			UNITS
			MIN	TYP	MAX	
<b>STATIC</b>						
Drain-Source Breakdown Voltage	V <sub>(BR)DSS</sub>	V <sub>GS</sub> = 0V, I <sub>D</sub> = 250μA	60			V
Gate Threshold Voltage	V <sub>GS(th)</sub>	V <sub>DS</sub> = V <sub>GS</sub> , I <sub>D</sub> = 250μA	1	1.7	2.5	
Gate-Body Leakage	I <sub>GSS</sub>	V <sub>DS</sub> = 0V, V <sub>GS</sub> = ±20V			±100	nA
Zero Gate Voltage Drain Current	I <sub>DSS</sub>	V <sub>DS</sub> = 48V, V <sub>GS</sub> = 0V			1	μA
		V <sub>DS</sub> = 40V, V <sub>GS</sub> = 0V, T <sub>J</sub> = 125 °C			10	
Drain-Source On-State Resistance <sup>1</sup>	R <sub>DS(ON)</sub>	V <sub>GS</sub> = 4.5V, I <sub>D</sub> = 3A		60	90	mΩ
		V <sub>GS</sub> = 10V, I <sub>D</sub> = 3.8A		46	70	
Forward Transconductance <sup>1</sup>	g <sub>fs</sub>	V <sub>DS</sub> = 5V, I <sub>D</sub> = 3.8A		11		S
<b>DYNAMIC</b>						
Input Capacitance	C <sub>iss</sub>	V <sub>GS</sub> = 0V, V <sub>DS</sub> = 25V, f = 1MHz		603		pF
Output Capacitance	C <sub>oss</sub>			62		
Reverse Transfer Capacitance	C <sub>rss</sub>			41		
Gate Resistance	R <sub>g</sub>	V <sub>GS</sub> = 0V, V <sub>DS</sub> = 0V, f = 1MHz		1.7		Ω
Total Gate Charge <sup>2</sup>	Q <sub>g</sub>	V <sub>DS</sub> = 30V, V <sub>GS</sub> = 10V, I <sub>D</sub> = 3.8A		13.2		nC
Gate-Source Charge <sup>2</sup>	Q <sub>gs</sub>			2.1		
Gate-Drain Charge <sup>2</sup>	Q <sub>gd</sub>			4.1		
Turn-On Delay Time <sup>2</sup>	t <sub>d(on)</sub>	V <sub>DS</sub> = 30V I <sub>D</sub> ≅ 1A, V <sub>GS</sub> = 10V, R <sub>GS</sub> = 24Ω		10.5		nS
Rise Time <sup>2</sup>	t <sub>r</sub>			17.4		
Turn-Off Delay Time <sup>2</sup>	t <sub>d(off)</sub>			28.8		
Fall Time <sup>2</sup>	t <sub>f</sub>			23		
<b>SOURCE-DRAIN DIODE RATINGS AND CHARACTERISTICS (T<sub>J</sub> = 25 °C)</b>						
Continuous Current	I <sub>S</sub>				2	A
Forward Voltage <sup>1</sup>	V <sub>SD</sub>	I <sub>F</sub> = 3.8A, V <sub>GS</sub> = 0V			1	V
Reverse Recovery Time	t <sub>rr</sub>	I <sub>F</sub> = 3.5A, di <sub>F</sub> /dt = 100A / μS		23		nS
Reverse Recovery Charge	Q <sub>rr</sub>				19	

<sup>1</sup>Pulse test : Pulse Width ≤ 300 μsec, Duty Cycle ≤ 2%.

<sup>2</sup>Independent of operating temperature.

# P7006BL

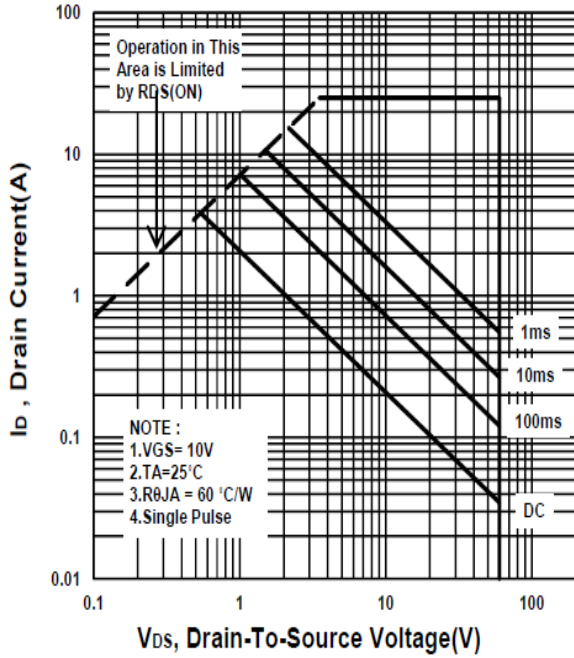
## N-Channel Enhancement Mode MOSFET



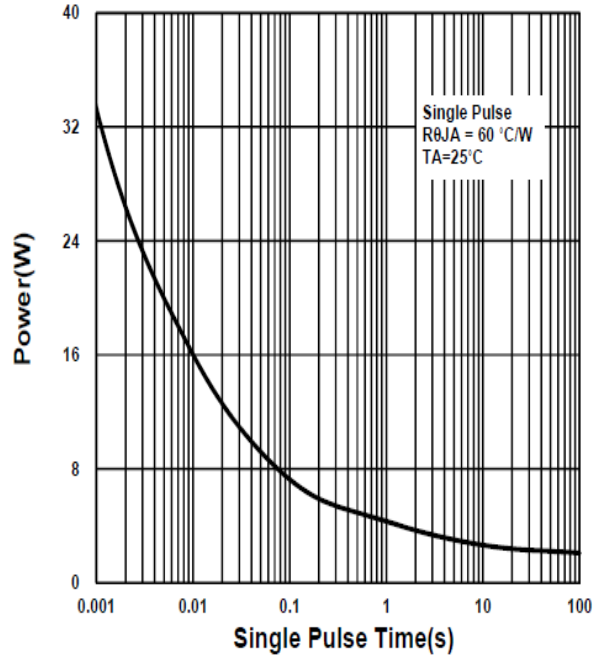
# P7006BL

## N-Channel Enhancement Mode MOSFET

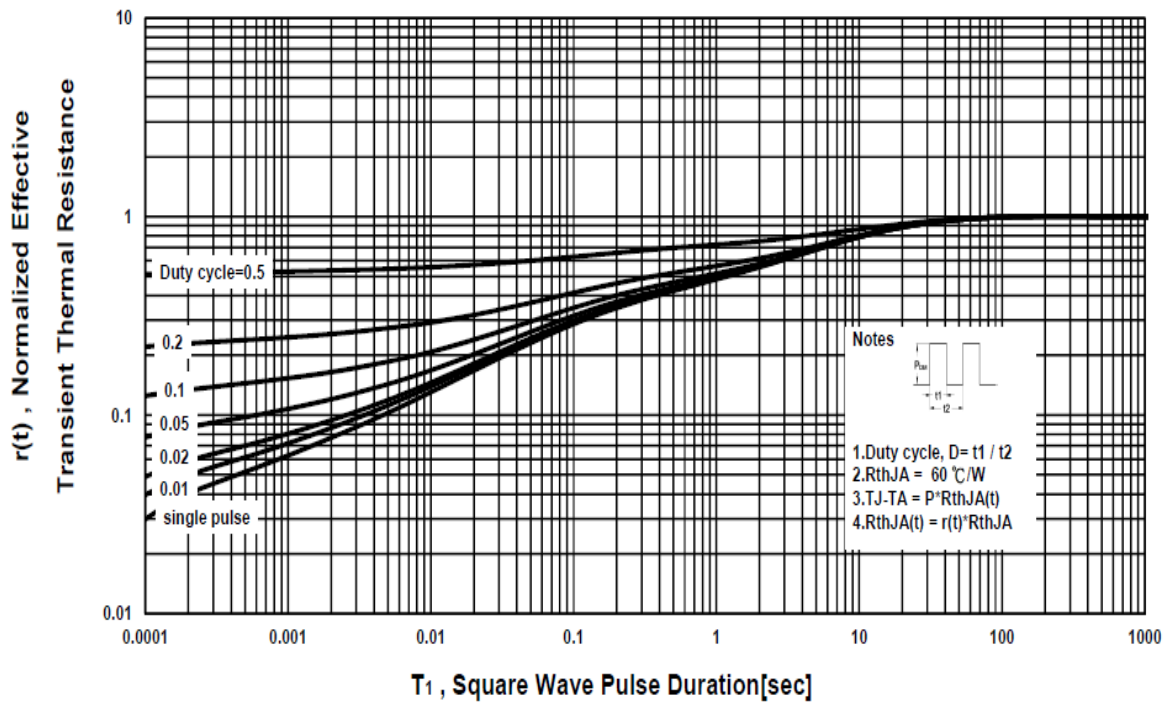
**Safe Operating Area**



**Single Pulse Maximum Power Dissipation**



**Transient Thermal Response Curve**



**P7006BL**  
**N-Channel Enhancement Mode MOSFET**

**Package Dimension**

**SOT-223 MECHANICAL DATA**

Dimension	mm			Dimension	mm		
	Min.	Typ.	Max.		Min.	Typ.	Max.
A	0.60	0.76	0.84	H	3.30	3.50	3.70
B	6.70	7.00	7.30	I	0.50	1.00	1.20
C	2.85	3.00	3.10	J	0.23	0.3	0.4
D	2.25	2.30	2.35	K	0°		10°
E	4.35	4.60	4.85	L	0	0.1	0.2
F	1.40	1.60	1.80	M			
G	6.30	6.50	6.80	N			

