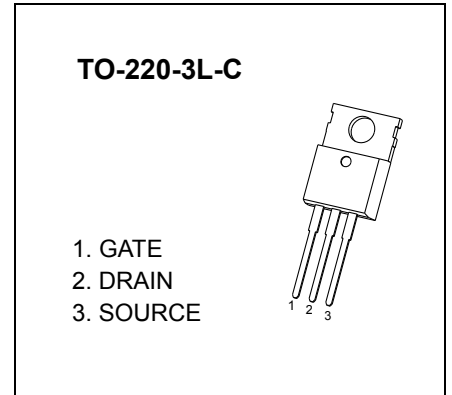




TO-220-3L-C Plastic-Encapsulate MOSFETS

P70SN10 N-Channel Power MOSFET

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	I_D
100V	8.9mΩ@10V	70A
	11mΩ@4.5V	



DESCRIPTION

The P70SN10 uses shielded gate trench technology and design to provide excellent $R_{DS(ON)}$ with low gate charge. It can be used in a wide variety of applications

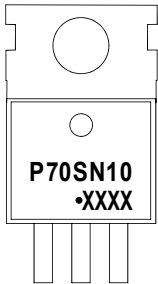
FEATURES

- Low $R_{DS(on)}$
- Low Gate Charge

APPLICATIONS

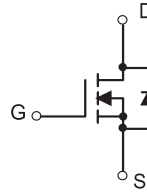
- High efficiency power supply
- Secondary synchronous rectifier

MARKING



P70SN10 = Device code.
 Solid dot = Green molding compound device, if none, the normal device.
 XXXX = Code.

EQUIVALENT CIRCUIT



MAXIMUM RATINGS ($T_a=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	100	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current	I_D	70	A
Pulsed Drain Current	I_{DM}	280	A
Single Pulsed Avalanche Energy	E_{AS}	90	mJ
Power Dissipation	P_D ①	125	W
Thermal Resistance from Junction to Ambient	$R_{\theta JA}$	62.5	$^\circ\text{C/W}$
Thermal Resistance from Junction to Case	$R_{\theta JC}$	1.0	$^\circ\text{C/W}$
Junction Temperature and Storage Temperature Range	T_J T_{stg}	-55 ~ +150	$^\circ\text{C}$

MOSFET ELECTRICAL CHARACTERISTICS

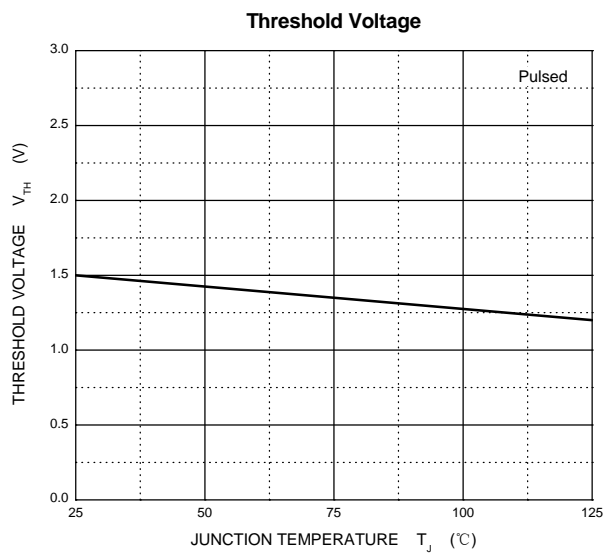
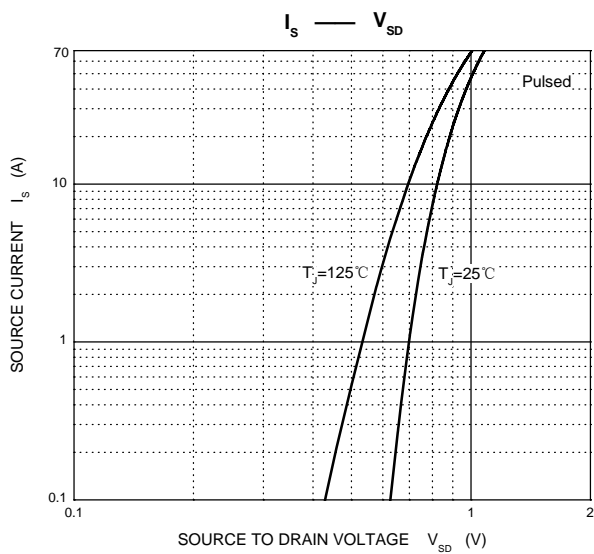
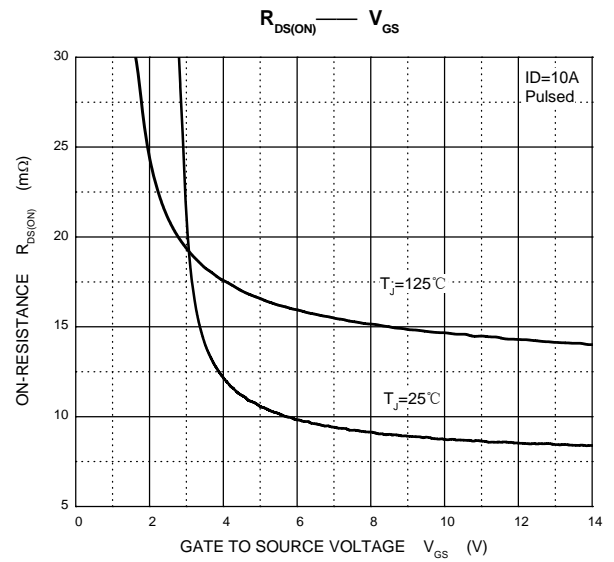
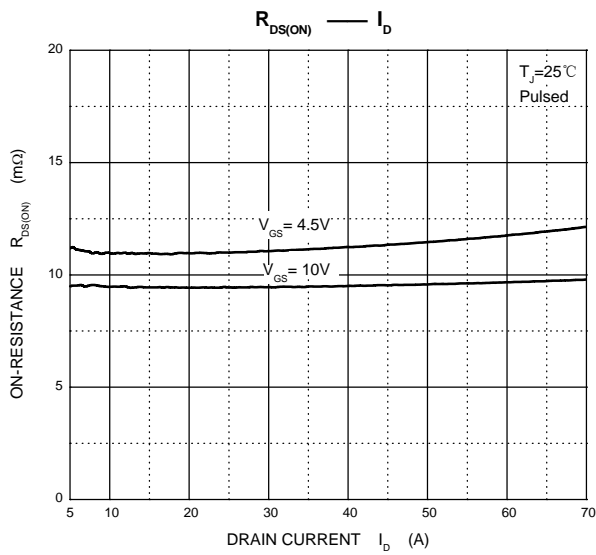
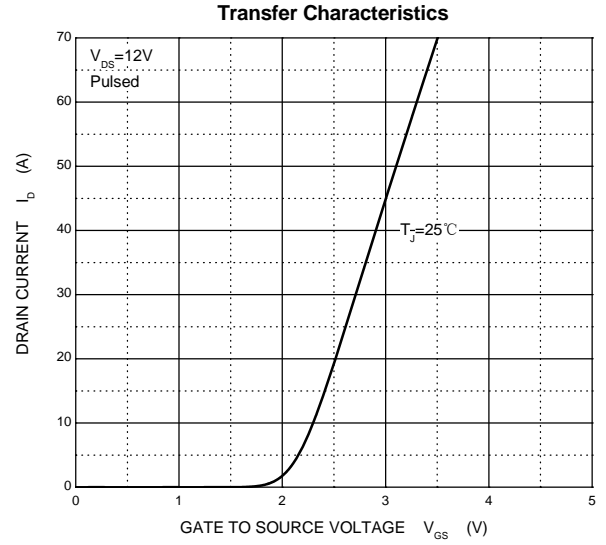
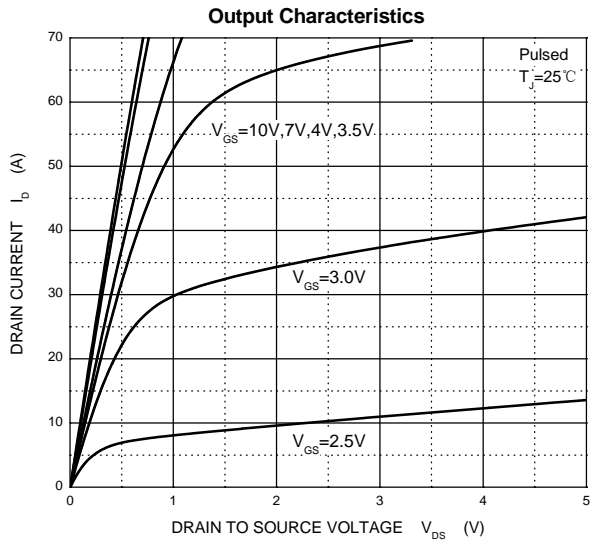
$T_a=25\text{ }^\circ\text{C}$ unless otherwise specified

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Off characteristics						
Drain-source breakdown voltage	$V_{(BR)DSS}$	$V_{GS} = 0V, I_D = 250\mu A$	100			V
Zero gate voltage drain current	I_{DSS}	$V_{DS} = 80V, V_{GS} = 0V$	$T_J = 25\text{ }^\circ\text{C}$		1.0	μA
			$T_J = 125\text{ }^\circ\text{C}$		100	
Gate-body leakage current	I_{GSS}	$V_{DS} = 0V, V_{GS} = \pm 20V$			± 100	nA
On characteristics ④						
Gate-threshold voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	1.0	1.6	2.5	V
Static drain-source on-state resistance	$R_{DS(on)}$	$V_{GS} = 10V, I_D = 10A$		9.0	12	m Ω
			$V_{GS} = 4.5V, I_D = 10A$		11	
Forward transconductance	g_{fs}	$V_{DS} = 10V, I_D = 10A$		20		S
Dynamic characteristics ④ ⑤						
Input capacitance	C_{iss}	$V_{DS} = 50V, V_{GS} = 0V, f = 100\text{KHz}$		1363	2700	pF
Output capacitance	C_{oss}			242	480	
Reverse transfer capacitance	C_{rss}			5.7	11	
Gate resistance	R_g	$f = 1\text{MHz}$		2.9		Ω
Switching characteristics ④ ⑤						
Total gate charge	Q_g	$V_{GS} = 10V, V_{DS} = 50V, I_D = 10A$		27.2	54.4	nC
Gate-source charge	Q_{gs}			2.4	4.8	
Gate-drain charge	Q_{gd}			7.2	14.4	
Turn-on delay time	$t_{d(on)}$	$V_{DS} = 50V, I_D = 1A, V_{GS} = 10V, R_G = 6\Omega$		14.2	28	ns
Turn-on rise time	t_r			20.8	42	
Turn-off delay time	$t_{d(off)}$			42	84	
Turn-off fall time	t_f			30	60	
Drain-Source Diode Characteristics						
Drain-source diode forward voltage(note1)	V_{SD} ④	$V_{GS} = 0V, I_S = 20A$			1.0	V
Continuous drain-source diode forward current	I_S ①				70	A
Pulsed drain-source diode forward current	I_{SM} ②				280	A

Notes:

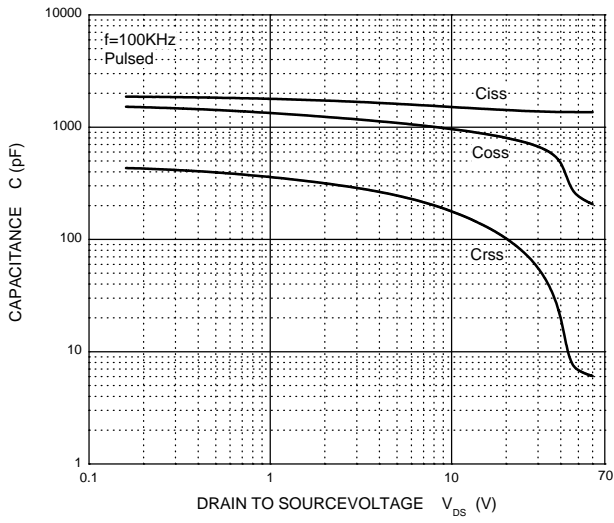
- $T_C = 25\text{ }^\circ\text{C}$ Limited only by maximum temperature allowed.
- $P_W \leq 10\mu s$, Duty cycle $\leq 1\%$.
- EAS condition: $V_{DD} = 50V, V_{GS} = 10V, L = 0.1\text{mH}, R_g = 25\Omega$ Starting $T_J = 25\text{ }^\circ\text{C}$.
- Pulse Test : Pulse Width $\leq 300\mu s$, duty cycle $\leq 2\%$.
- Guaranteed by design, not subject to production.

Typical Characteristics

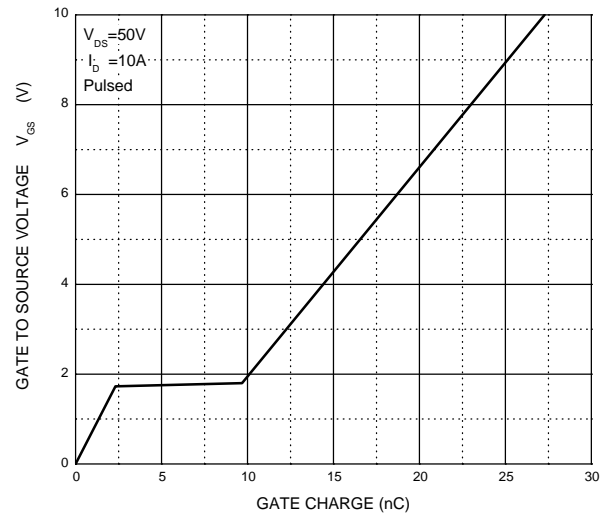


Typical Characteristics

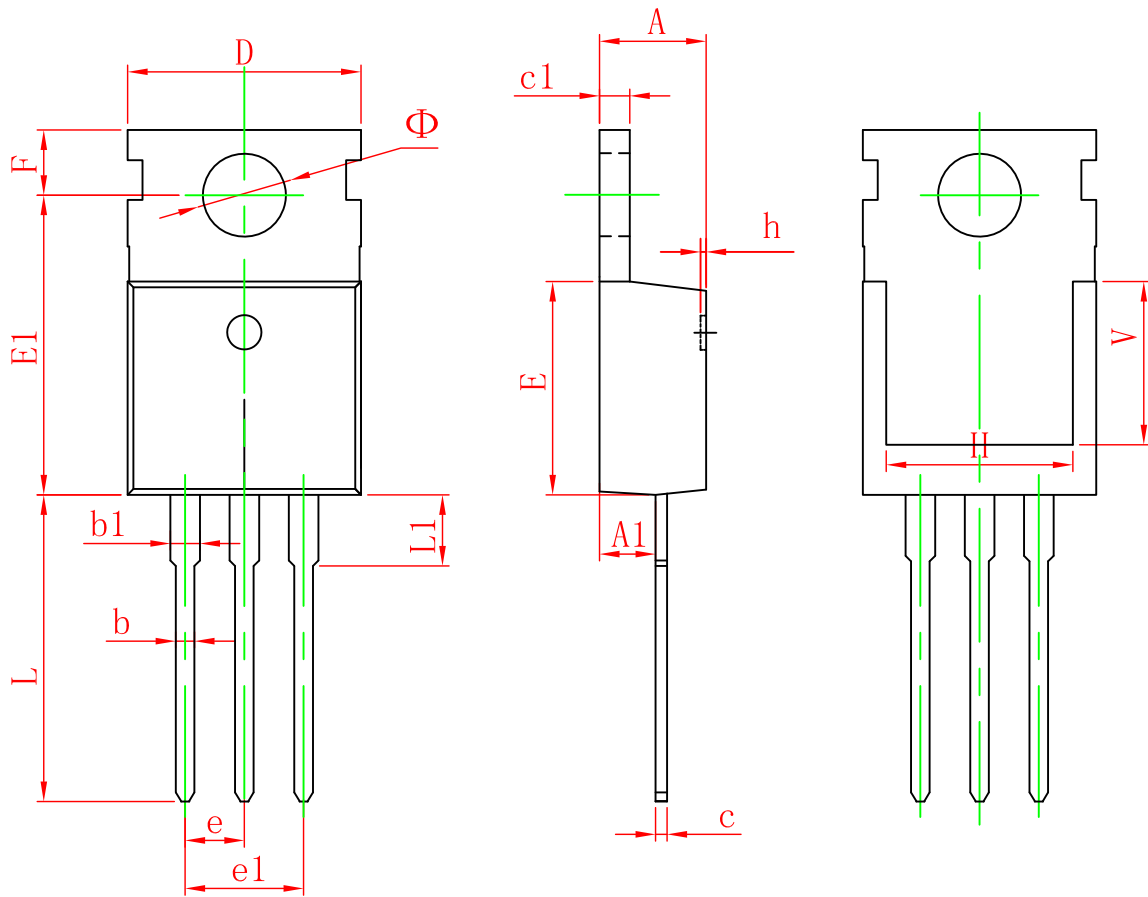
Capacitances



Gate Charge



TO-220-3L-C Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.400	4.600	0.173	0.181
A1	2.250	2.550	0.089	0.100
b	0.710	0.910	0.028	0.036
b1	1.170	1.370	0.046	0.054
c	0.330	0.650	0.013	0.026
c1	1.200	1.400	0.047	0.055
D	9.910	10.250	0.390	0.404
E	8.950	9.750	0.352	0.384
E1	12.650	12.950	0.498	0.510
e	2.540 TYP.		0.100 TYP.	
e1	4.980	5.180	0.196	0.204
F	2.650	2.950	0.104	0.116
H	7.900	8.100	0.311	0.319
h	0.000	0.300	0.000	0.012
L	12.900	13.400	0.508	0.528
L1	2.850	3.250	0.112	0.128
V	7.500 REF.		0.295 REF.	
Φ	3.400	3.800	0.134	0.150