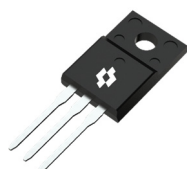


Product Summary

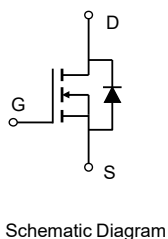
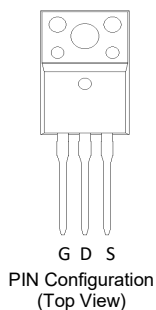
V_{DS}	$R_{DS(ON_TYP)}$	I_{D_MAX}
800 V	390 mΩ @ $V_{GS} = 18V$	9.0 A

TO220F-3L


Top View



Bottom View


Features

- High blocking voltage with low On-Resistance
- High speed switching with low capacitances
- Easy to parallel and simple to drive
- Avalanche ruggedness
- Halogen free, RoHS compliant


Benefits

- Higher system efficiency
- Reduced cooling requirements
- Increased power density
- Increased system switching frequency

Applications

- Solar inverters
- Switch mode power supplies
- High voltage DC/DC converters
- Battery chargers
- Motor drives
- Pulsed power applications

Ordering Information

Orderable Part Number	Package Type	Device Marking	Form	Quantity (pcs)
SCMP80R390BF	TO220F-3L	P80R390B	Tube	50

Maximum Ratings (@ $T_C = 25^\circ\text{C}$, unless otherwise specified.)

Parameter	Symbol	Test Condition	Value	Unit
Drain - Source Voltage	V_{DSmax}	$V_{GS} = 0\text{ V}, I_D = 100\text{ }\mu\text{A}$	800	V
Gate - Source Voltage	V_{GSmax}	Absolute maximum values	-10/+22	V
Gate - Source Voltage	V_{GSop}	Recommended operating values	-5/+18	V
Continuous Drain Current ⁽¹⁾	I_D	$T_C = 25^\circ\text{C}$	9.0	A
		$T_C = 100^\circ\text{C}$	6.0	A
Pulsed Drain Current ⁽²⁾	I_{DM}	-	26	A
Total Power Dissipation	P_{TOT}	$T_C = 25^\circ\text{C}, T_C = 175^\circ\text{C}$,	52	W
Junction & Storage Temperature Range	T_J, T_{STG}	-	-55 ~ +175	$^\circ\text{C}$

Thermal Characteristics

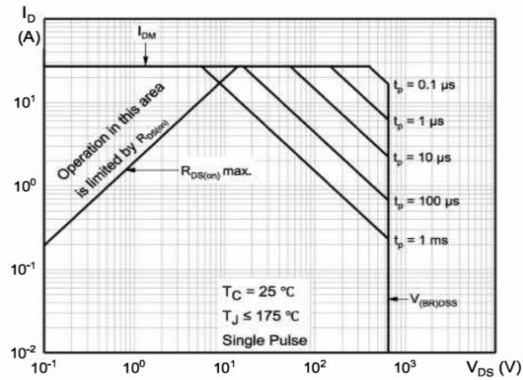
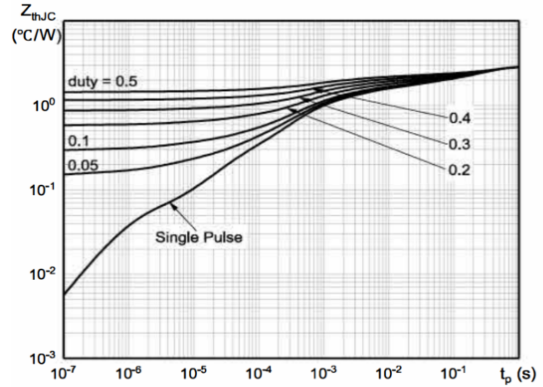
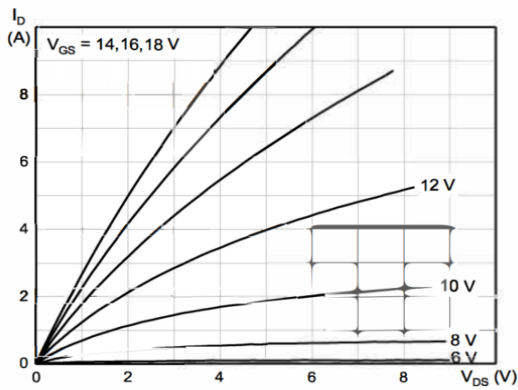
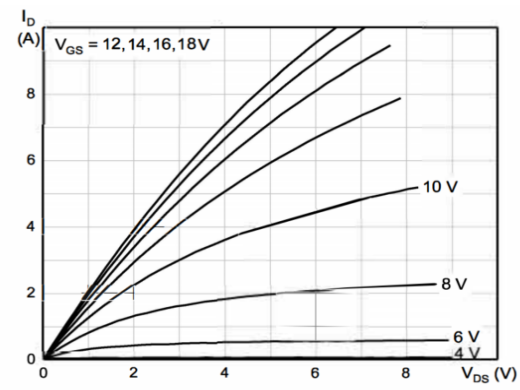
Parameter	Symbol	Typ.	Max.	Unit
Thermal Resistance, Junction-to-Ambient	$R_{\theta JA}$	40	-	$^\circ\text{C/W}$
Thermal Resistance, Junction-to-Case	$R_{\theta JC}$	2.88	-	$^\circ\text{C/W}$

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

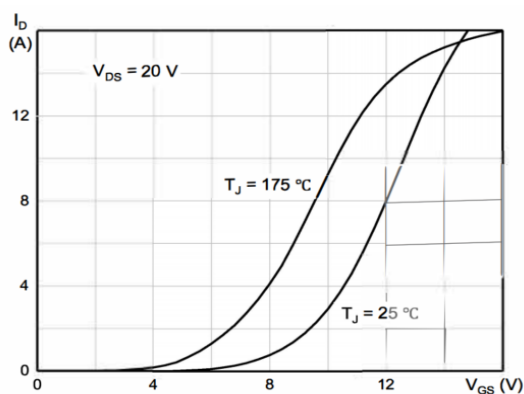
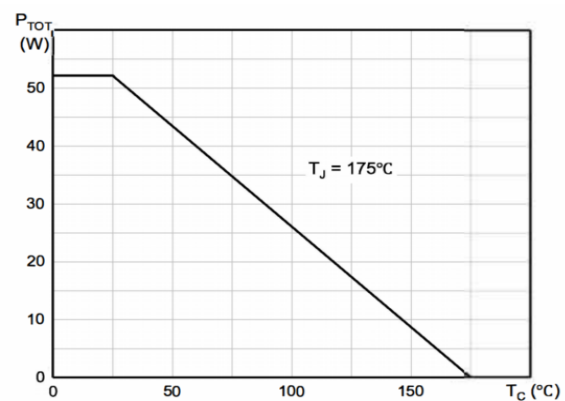
Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Off Characteristics						
Drain-Source Breakdown Voltage	V _{(BR)DSS}	V _{GS} = 0V, I _D = 1.0mA	800	-	-	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 800V, V _{GS} = 0V	-	2.0	100	μA
Gate-Source Leakage Current	I _{GSS+}	V _{GS} = +22V, V _{DS} = 0V	-	-	200	nA
Gate-Source Leakage Current	I _{GSS-}	V _{GS} = -10V, V _{DS} = 0V	-	-	200	nA
On Characteristics						
Gate Threshold Voltage	V _{GS(th)}	V _{GS} = V _{DS} , I _{DS} = 1.0mA, T _J = 25°C	2.2	3.4	4.2	V
		V _{GS} = V _{DS} , I _{DS} = 1.0mA, T _J = 175°C	-	2.6	-	V
Static Drain-Source On-Resistance	R _{DS(ON)}	V _{GS} = 18V, I _D = 5.0A, T _J =25°C	-	390	450	mΩ
		V _{GS} = 18V, I _D = 5.0A, T _J =175°C	-	520	-	mΩ
Diodes Forward Voltage	V _{SD}	V _{GS} = -5V, I _{SD} = 2.5A, T _J =25°C	-	4.0	-	V
		V _{GS} = -5V, I _{SD} = 2.5A, T _J =175°C	-	3.6	-	V
Dynamic Characteristics						
Input Capacitance	C _{iss}	V _{DS} = 400V, V _{GS} = 0V, f = 1MHz	-	208	-	pF
Output Capacitance	C _{oss}		-	18	-	pF
Reverse Transfer Capacitance	C _{rss}		-	1.8	-	pF
Internal Gate Resistance	R _{G(int)}	f = 1MHz, I _D =0A	-	59	-	Ω
Switching Characteristics						
Turn-On Switching Energy	E _{on}	V _{DD} =400V, I _b = 5.0A, R _G =10Ω, V _{GS} =-5/18V	-	25	-	μJ
Turn-Off Switching Energy	E _{off}		-	10	-	
Turn-On DelayTime	t _{d(on)}	V _{DD} =400V, I _b = 5.0A, R _G =10Ω, V _{GS} =-5/18V	-	5	-	ns
Rise Time	t _r		-	17	-	ns
Turn-Off DelayTime	t _{d(off)}		-	8	-	ns
Fall Time	t _f		-	10	-	ns
Gate Charge Characteristics						
Total Gate Charge	Q _g	V _{DD} =400V, V _{GS} =-5/18 V, I _D = 5.0A	-	10.6	-	nC
Gate-Source Charge	Q _{gs}		-	5.1	-	nC
Gate-Drain Charge	Q _{gd}		-	2.2	-	nC
Drain-Source Diode Characteristics						
Reverse Recovery Time	t _{rr}	V _{DD} = 400V, V _{GS} =-5V, I _{SD} = 5.0 A, di/dt=1000A/μs	-	50	-	ns
Reverse Recovery Charge	Q _{rr}		-	38	-	nC
Peak Reverse Recovery Current	I _{RRM}		-	2.4	-	A
Continuous Diode Forward Current ⁽³⁾	I _{SD}	T _J = 25°C	-	-	11	A
		T _J = 175°C	-	-	6.0	A

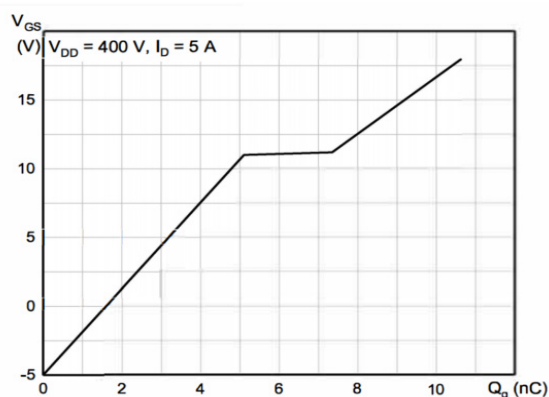
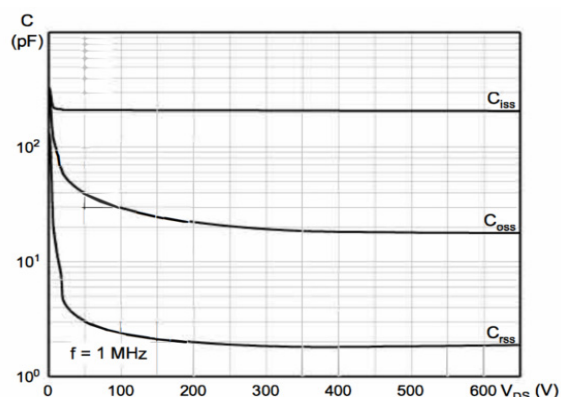
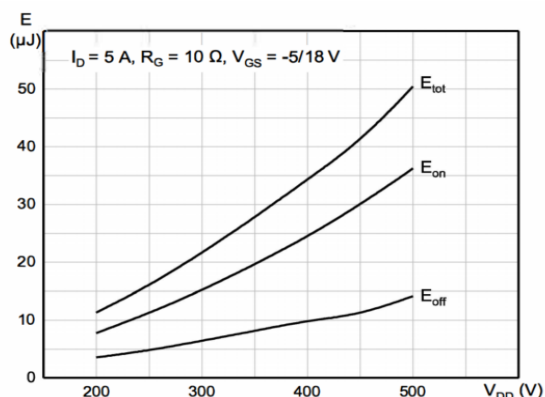
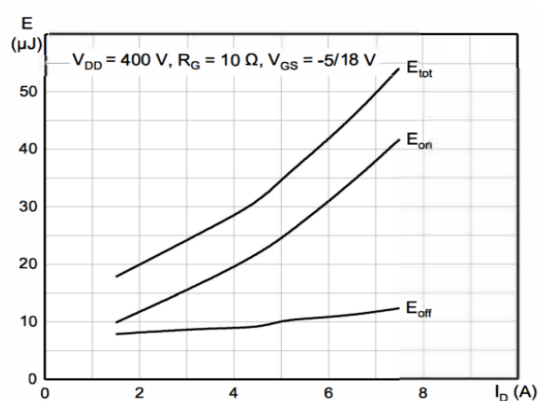
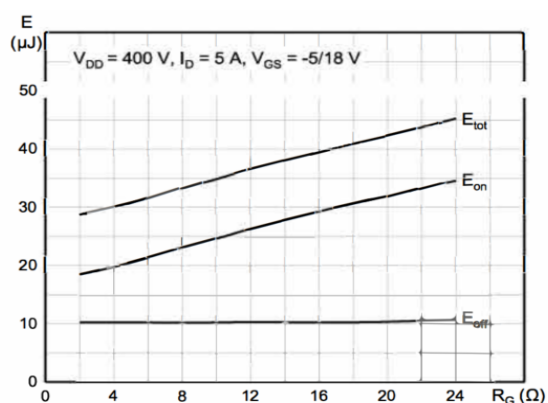
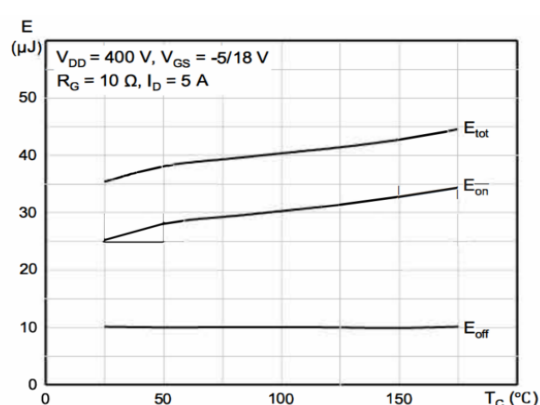
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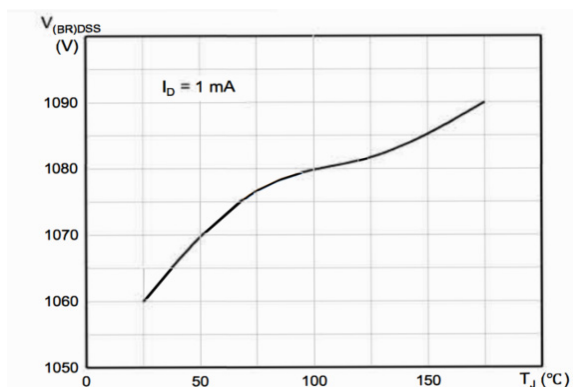
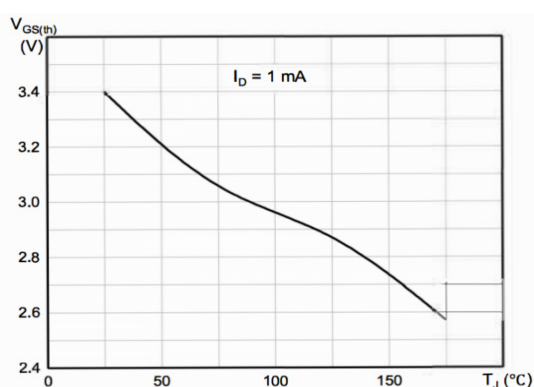
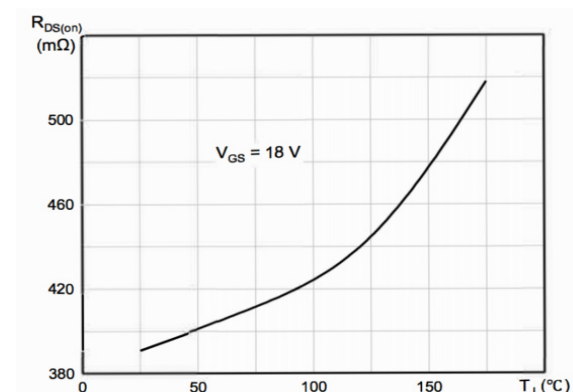
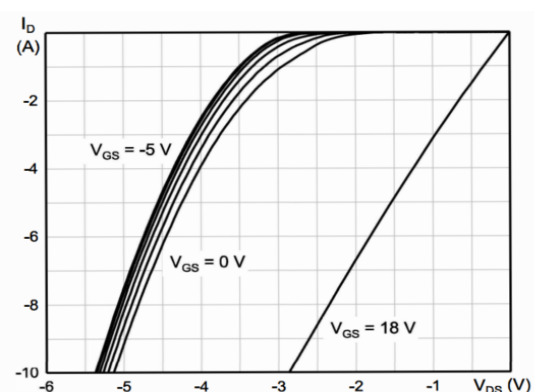
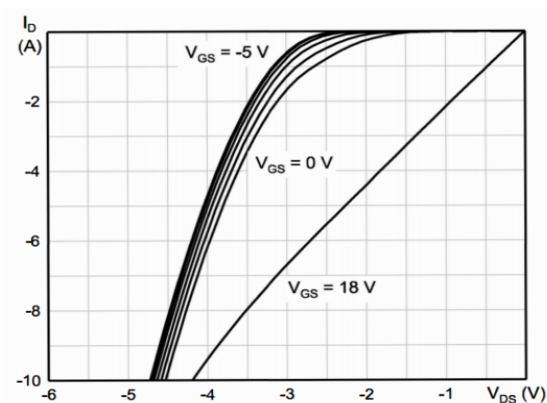
1. Continuous Drain Current is limited by package.
2. Pulse width is limited by Safe Operating Area (SOA).
3. Continuous Diode Forward Current is limited by bonding wires.

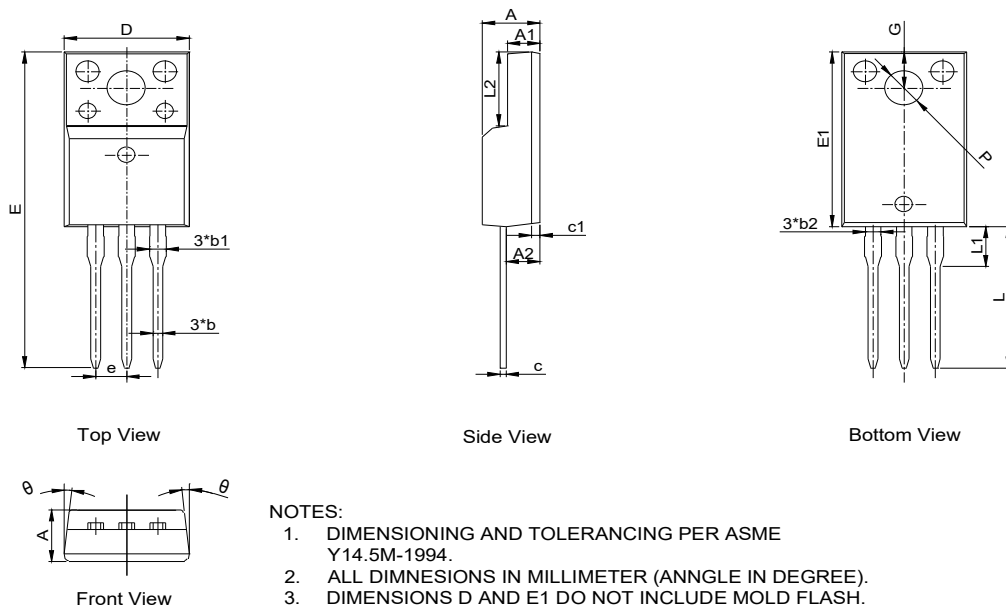
Typical Electrical and Thermal Characteristics

Figure 1. Safe Operating Area

Figure 2. Maximum Transient Thermal Impedance

Figure 3. Typical Output Characteristics, $T_J = 25^\circ\text{C}$

Figure 4. Typical Output Characteristics, $T_J = 175^\circ\text{C}$

P75R390B


Figure 5. Typical Transfer Characteristics

Figure 6. Total Power Dissipation

Typical Electrical and Thermal Characteristics

Figure 7. Typical Gate Charge Characteristics

Figure 8. Typical Capacitance Characteristics

Figure 9. Typical Switching Energy vs. Supply Voltage

Figure 10. Typical Switching Energy vs. Drain Current

Figure 11. Typical Switching Energy vs. Gate Resistance

Figure 12. Typical Switching Energy vs. Temperature

Typical Electrical and Thermal Characteristics

Figure 13. Breakdown Voltage vs. Temperature

Figure 14. Gate Threshold vs. Temperature

Figure 15. On-Resistance vs. Temperature

Figure 16. Body Diode Characteristics, $T_J = 25^{\circ}\text{C}$

Figure 17. Body Diode Characteristics, $T_J = 175^{\circ}\text{C}$

TO220F-3L Package Outline
Package Outline

NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M-1994.
2. ALL DIMENSIONS IN MILLIMETER (ANGLE IN DEGREE).
3. DIMENSIONS D AND E1 DO NOT INCLUDE MOLD FLASH.

DIM.	MILLIMETER		
	MIN.	NOM.	MAX.
A	4.50	4.70	4.90
A1	2.34	2.54	2.74
A2	2.50	2.76	2.96
b	0.60	0.80	1.00
b1	--	--	1.47
b2	1.10	--	1.38
c	0.40	0.50	0.63
c1	0.70 REF		
D	9.96	--	10.40
e	2.54 BSC		
E	28.30	28.85	29.35
E1	15.67	15.87	16.10
G	3.20	--	3.40
L	12.68	--	13.30
L1	--	--	3.50
L2	6.48	6.68	6.88
P	3.30 REF		
theta	0°	--	12°