

Product Summary

$V_{(BR)DSS}$	$R_{DS(on)MAX}$	I_D
120V	9mΩ@10V	90A
	12mΩ@4.5V	

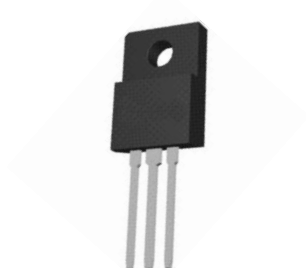
Feature

- Advanced SGT technology
- Excellent $R_{DS(on)}$
- Low gate charge

Application

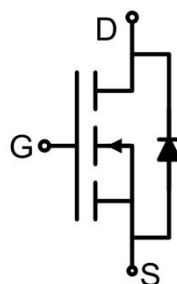
- Mobile phone fast charging
- Brushless motor
- Home appliance control board

Package

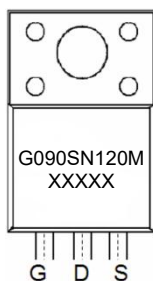


ITO-220AB

Circuit diagram



Marking



Absolute maximum ratings ($T_C=25^{\circ}\text{C}$ unless otherwise noted)

Parameter	Symbol	Value	Unit
Drain-Source Voltage	V_{DS}	120	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ¹⁾	I_D	90	A
Continuous Drain Current ¹⁾ ($T_C = 70^{\circ}\text{C}$)	$I_D(70^{\circ}\text{C})$	35	A
Pulsed Drain Current	I_{DM}	270	A
Single Pulse Avalanche Energy ²⁾	E_{AS}	125	mJ
Power Dissipation ³⁾	P_D	160	W
Thermal Resistance Junction to Case	$R_{\theta JC}$	0.89	$^{\circ}\text{C/W}$
Operating Junction Temperature	T_J	$-55 \sim +150$	$^{\circ}\text{C}$
Storage Temperature	T_{STG}	$-55 \sim +150$	$^{\circ}\text{C}$

Electrical characteristics ($T_J=25^{\circ}\text{C}$, unless otherwise noted)

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Static Characteristics						
Drain-source breakdown voltage	V _{(BR)DSS}	V _{GS} =0V, I _D =250μA	120			V
Zero gate voltage drain current	I _{DSS}	V _{DS} =120V, V _{GS} =0V			1	μA
Gate-body leakage current	I _{GSS}	V _{DS} =0V, V _{GS} =±20V			±100	nA
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	1.5	2	2.5	V
Drain-source on-resistance	R _{DS(on)}	V _{GS} =10V, I _D =20A		7.5	9	mΩ
		V _{GS} =4.5V, I _D =10A		9	12	
Dynamic characteristics ⁴⁾						
Input Capacitance	C _{iss}	V _{DS} =60V, V _{GS} =0V, f =1MHz		1854		pF
Output Capacitance	C _{oss}			270		
Reverse Transfer Capacitance	C _{rss}			10		
Total Gate Charge	Q _g	V _{DS} =60V, V _{GS} =10V, I _D =20A		30		nC
Gate-Source Charge	Q _{gs}			5.8		
Gate-Drain Charge	Q _{gd}			6		
Turn-on delay time	t _{d(on)}	V _{DS} =60V, V _{GS} =10V ,I _D =20A R _G =3Ω		9.5		nS
Turn-on rise time	t _r			4.2		
Turn-off delay time	t _{d(off)}			27.2		
Turn-off fall time	t _f			6.6		
Source-Drain Diode characteristics						
Diode Forward Current	I _S	T _C =25℃			90	A
Diode Forward voltage	V _{SD}	V _{GS} =0V, I _S =20A			1.2	V
Reverse Recovery Time	T _{rr}	I _F =20A, di/dt =100A/μs		52		nS
Reverse Recovery Charge	Q _{rr}			83.5		nC

Notes:

- 1) The data tested by surface mounted on a 1 inch² FR-4 board with 20Z copper.
- 2) EAS condition: $T_J = 25^{\circ}\text{C}$, $V_{DD} = 50V$, $V_{GS} = 10V$, $L = 0.1mH$, $I_{AS} = 30A$.
- 3) The power dissipation is limited by 150°C junction temperature.
- 4) Guaranteed by design, not subject to production testing.

Typical Characteristics

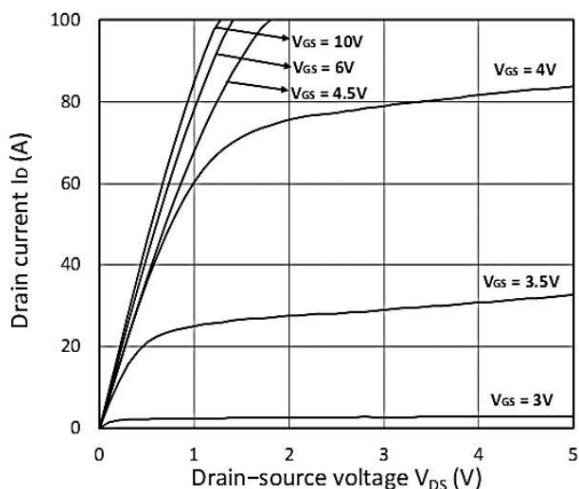


Figure 1. Output Characteristics

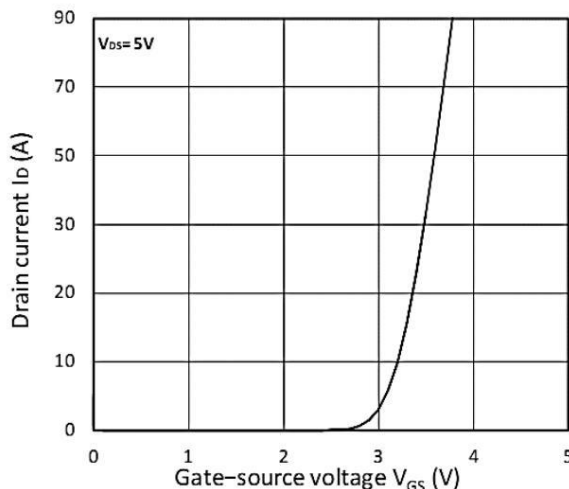


Figure 2. Transfer Characteristics

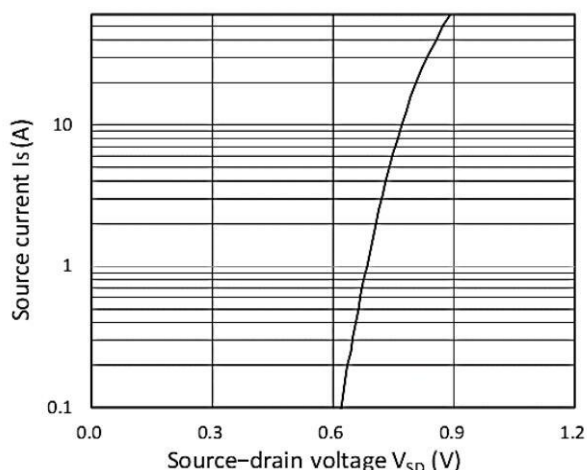


Figure 3. Forward Characteristics of Reverse

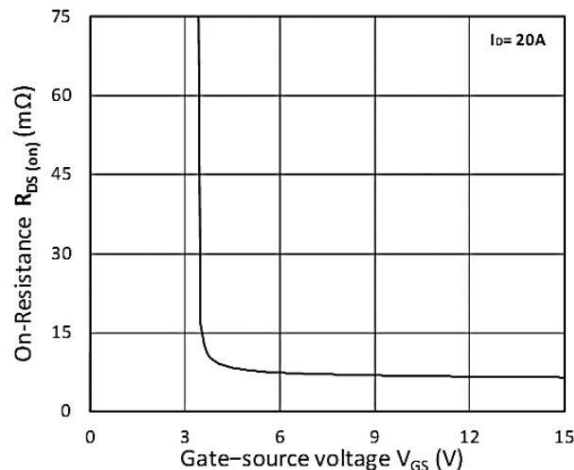


Figure 4. R_DS(ON) vs. V_GS

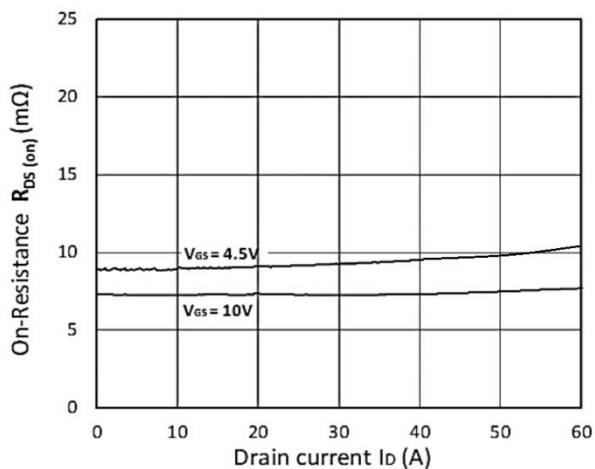


Figure 5. R_DS(ON) vs. I_D

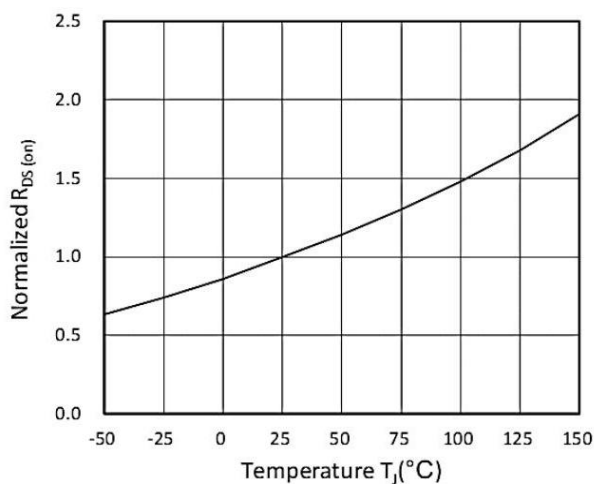


Figure 6. Normalized R_DS(on) vs. Temperature

Typical Characteristics

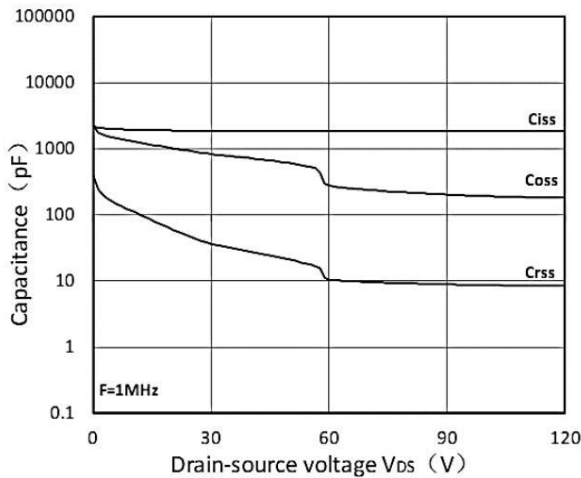


Figure 7. Capacitance Characteristics

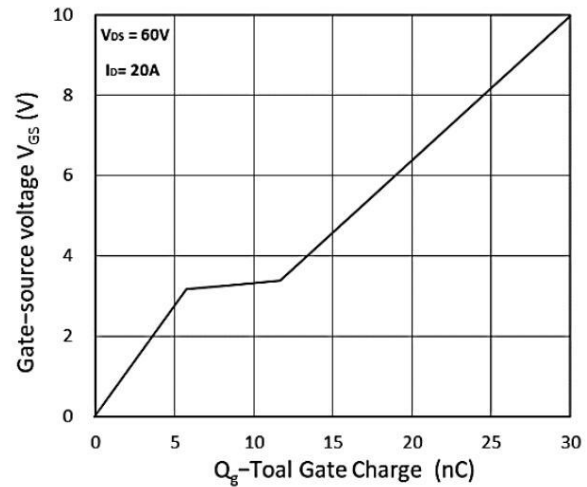


Figure 8. Gate Charge Characteristics

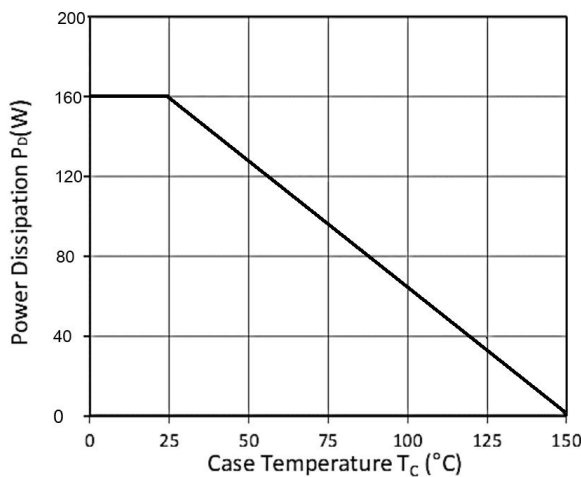


Figure 9. Power Dissipation

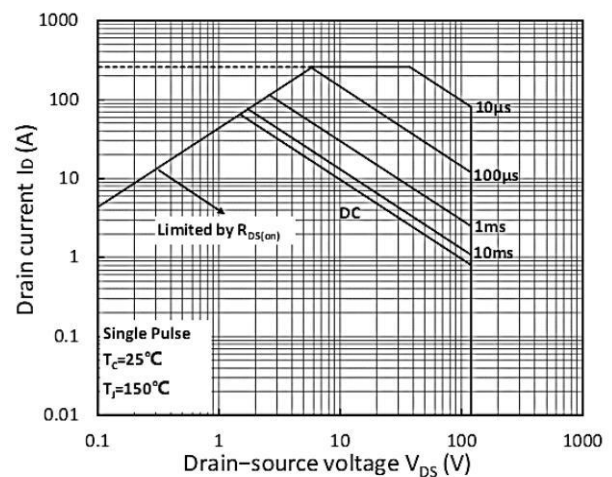


Figure 10. Safe Operating Area

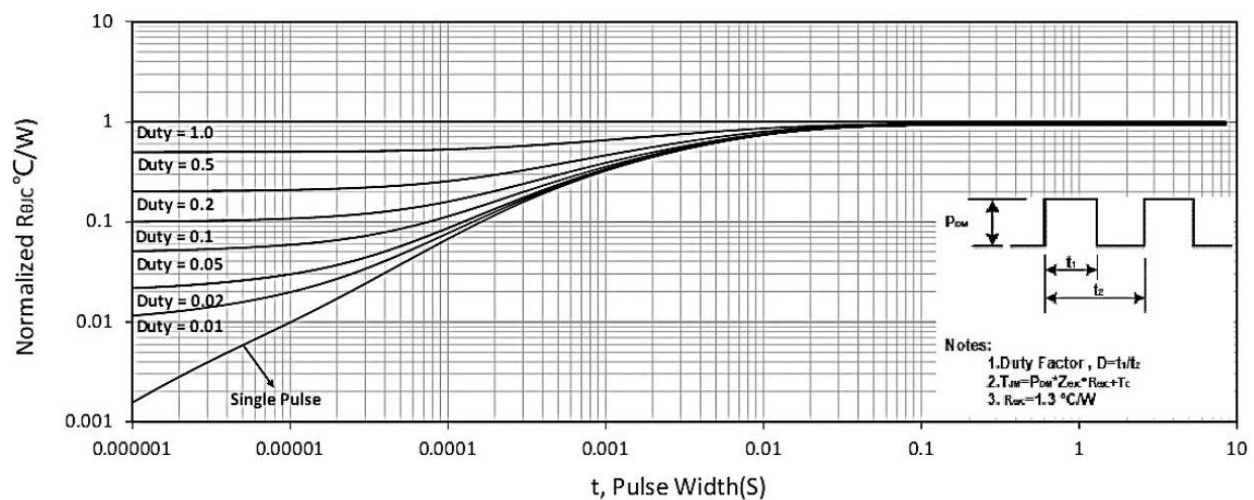
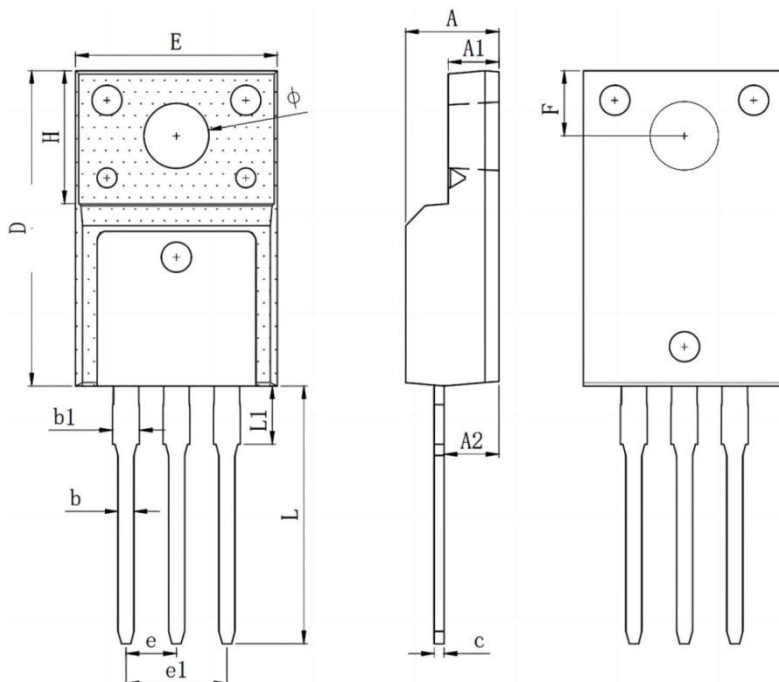


Figure 11. Normalized Maximum Transient Thermal Impedance

ITO-220AB Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	4.500	5.000	0.177	0.197
A1	2.340	2.840	0.092	0.112
A2	2.400	3.400	0.094	0.134
b	0.700	0.950	0.028	0.037
b1	1.050	1.550	0.041	0.061
c	0.400	0.650	0.016	0.026
D	15.570	16.170	0.613	0.637
H	6.700 REF.		0.264 REF.	
E	9.860	10.460	0.388	0.412
e	2.540 BSC.		0.100 BSC.	
e1	5.080 BSC.		0.200 BSC.	
L	12.650	13.300	0.498	0.524
L1	2.780	3.380	0.109	0.133
F	3.150	3.550	0.124	0.140
φ	3.000	3.650	0.118	0.144