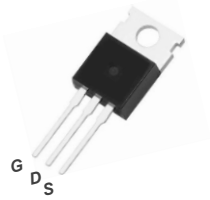
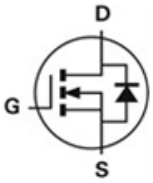
N-Channel Enhancement Mode MOSFET

Features

- Advanced SGT technology
- High Speed Power Switching
- Reliable and Rugged
- ROHS Compliant
- 100% Avalanche Tested

Pin Description

TO-220	Symbol
	

Applications

- Power Management in Desktop Computer
- DC/DC Converters

V_{DSS}	200	V
$R_{DS(ON)-Typ}$	9.2	mΩ
I_D	110	A

Absolute Maximum Ratings(T_J=25℃, Unless Otherwise Noted)

Symbol	Parameter		Rating	Unit
V_{DSS}	Drain-Source Voltage		200	V
V_{GSS}	Gate-Source Voltage		±20	V
T_J	Maximum Junction Temperature		-55 to 150	℃
T_{STG}	Storage Temperature Range		-55 to 150	℃
E_{AS}	Single Pulse Avalanche Energy		2000	mJ
I_{DM} ①	Pulse Drain Current Tested		440	A
I_D	Continuous Drain Current	T_C=25°C	110	A
	Continuous Drain Current	T_C=100°C	75	A
P_D	Maximum Power Dissipation	T_C=25°C	333	W

Thermal Characteristics

Symbol	Parameter	Rating	Unit
$R_{\theta JA}$ ③	Thermal Resistance-Junction to Ambient	62	℃/W
$R_{\theta JC}$	Thermal Resistance, Junction-to-Case	0.45	℃/W

Note ①: Max. current is limited by bonding wire.

Note ②: UIS tested and pulse width are limited by maximum junction temperature 150℃.

Note ③: Surface Mounted on 1in^2 FR-4 board with 1oz.

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Electrical Characteristics (T_J=25℃, Unless Otherwise Noted)

Symbol	Parameter	Test Conditions	Min	Typ	Max	Unit
Static Electrical Characteristics						
BV_{DSS}	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250uA	200	---	---	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=200V, V_{GS}=0V	---	---	1	uA
		V_{DS}=160V,V_{GS}=0V, T_J =125℃	---	---	100	uA
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS} , I_D=250uA	3.0	---	5.0	V
I_{GSS}	Gate Leakage Current	V_{GS}=±20V, V_{DS}=0V	---	---	±100	nA
$R_{DS(ON)}$	Drain-Source On-state Resistance	V_{GS}=10V, I_D=40A	---	9.2	11.5	mΩ
Dynamic Characteristics⑤						
C_{iss}	Input Capacitance	V_{GS}=0V, V_{DS}=100V, Freq.=1.0MHz	---	6790	---	pF
C_{oss}	Output Capacitance		---	385	---	
C_{rss}	Reverse Transfer Capacitance		---	6	---	
$T_{d(on)}$	Turn-on Delay Time	V_{GS}=10V,V_{DD}=100V, I_D=55A,R_G=4.7Ω	---	38	---	nS
T_r	Turn-on Rise Time		---	15	---	
$T_{d(off)}$	Turn-off Delay Time		---	42	---	
T_f	Turn-off Fall Time		---	11	---	
Q_g	Total Gate Charge	V_{GS}=10V,V_{DD}=100V, I_D=55A	---	81	---	nC
Q_{gs}	Gate-Source Charge		---	36	---	
Q_{gd}	Gate-Drain Charge		---	12	---	
Source-Drain Characteristics						
I_S	Continuous Source Current		--	---	110	A
V_{SD}	Diode Forward Voltage	I_S=80A, V_{GS}=0V	---	---	1.2	V
t_{rr}	Reverse recovery time	I_F=55A, diF/dt=100A/μs	---	163	---	ns
Q_{rr}	Reverse recovery charge		---	570	---	nC

Note ④: Pulse test (pulse width≤300us, duty cycle≤2%).

Note ⑤ : Guaranteed by design, not subject to production testing.

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Typical Characteristics

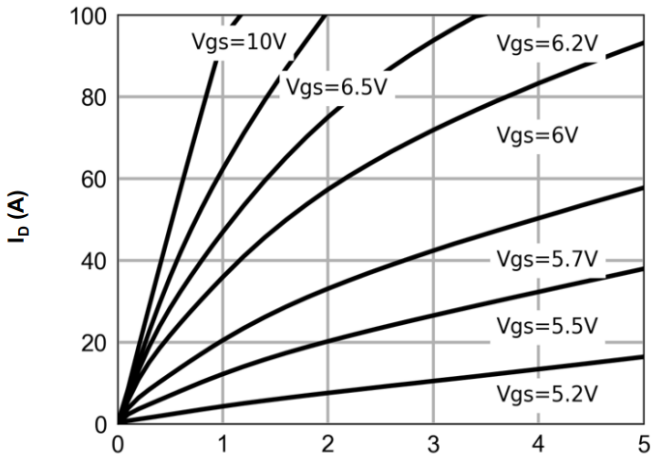

Figure 1: On-Region Characteristics

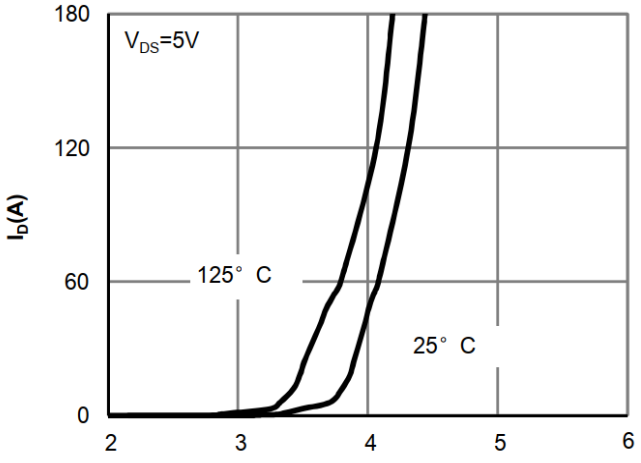

Figure 2: Transfer Characteristics

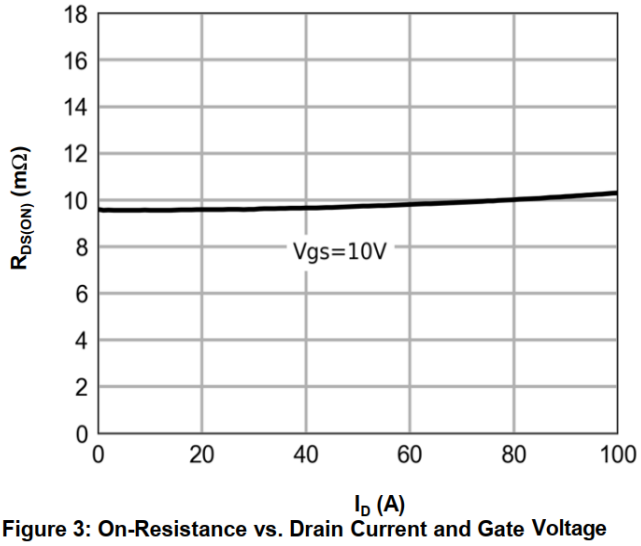

Figure 3: On-Resistance vs. Drain Current and Gate Voltage

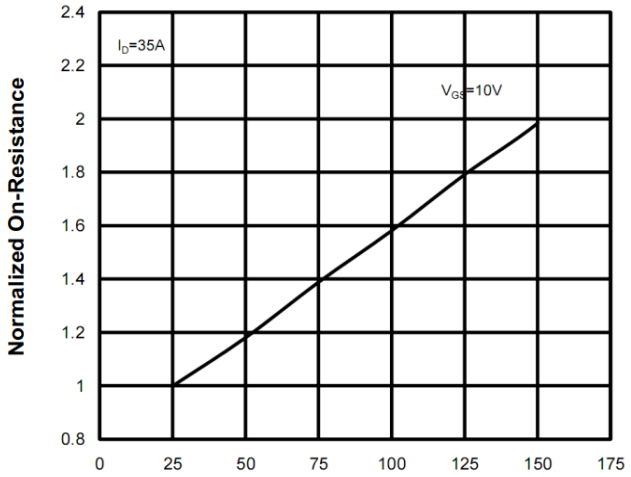

Figure 4: On-Resistance vs. Junction Temperature

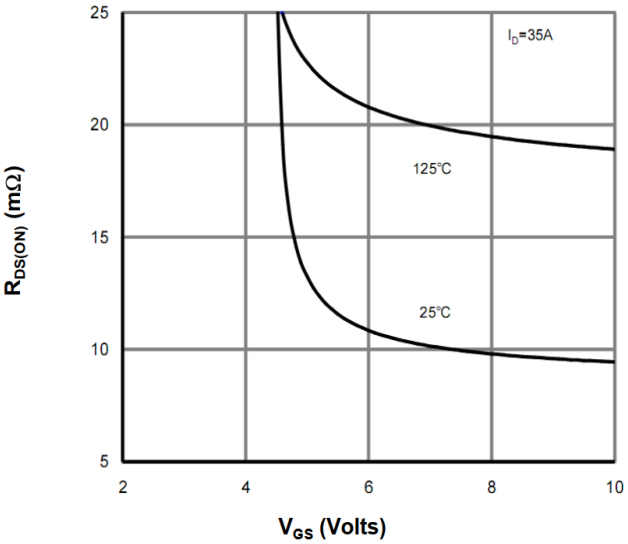

Figure 5: On-Resistance vs. Gate-Source Voltage

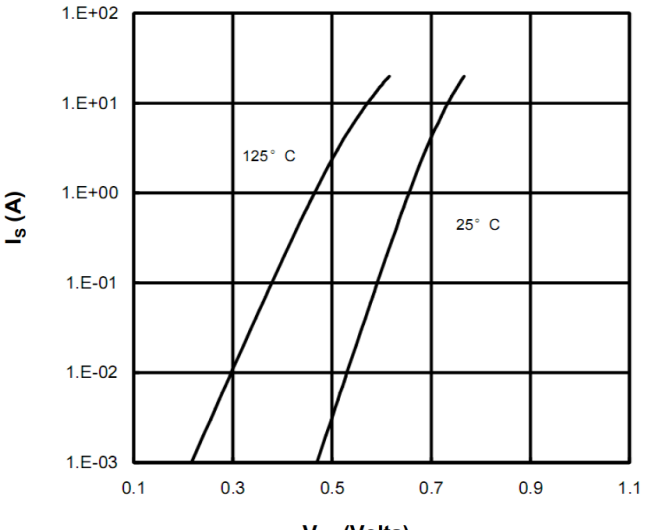

Figure 6: Body-Diode Characteristics

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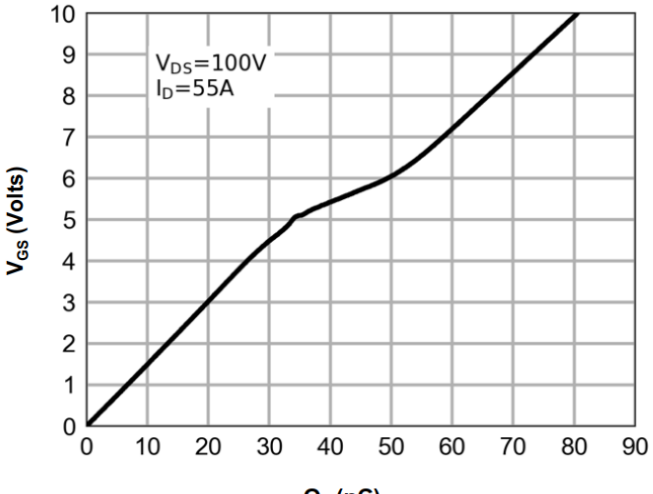

Figure 7: Gate-Charge Characteristics

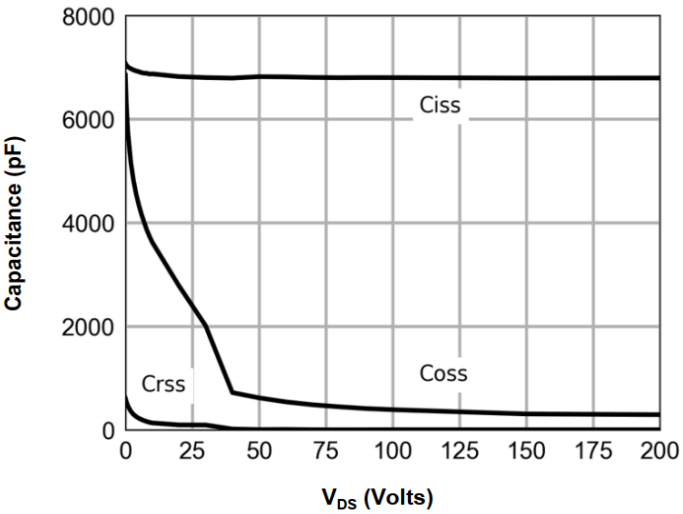

Figure 8: Capacitance Characteristics

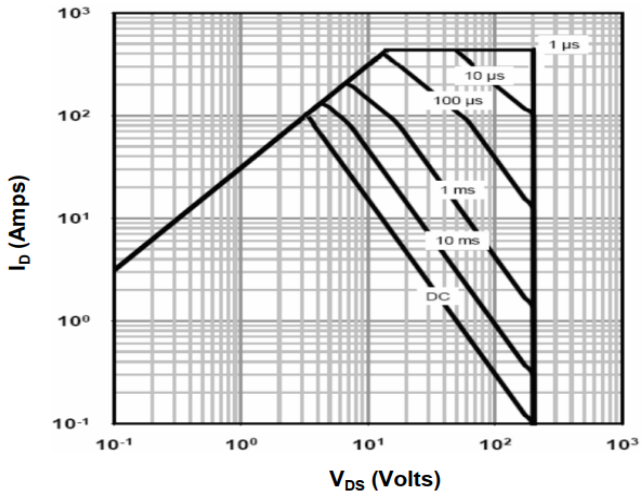

Figure 9: Maximum Forward Biased Safe Operating Area

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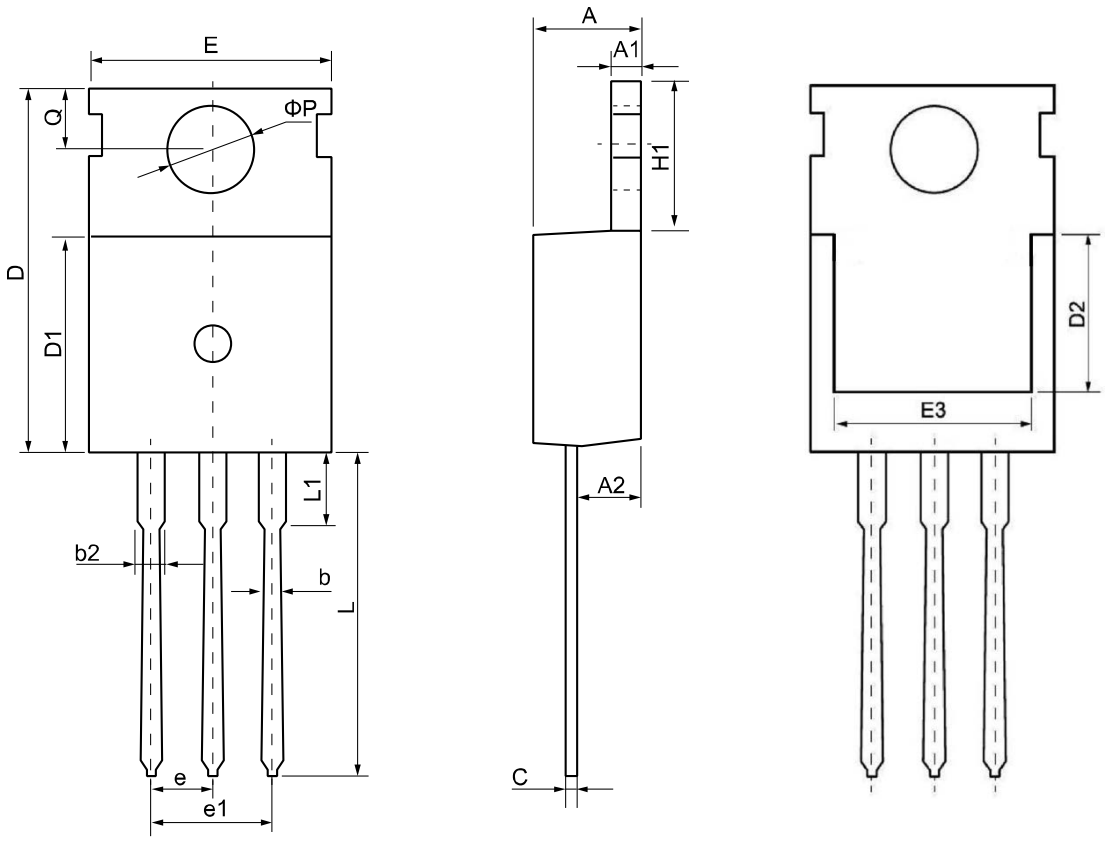
TO-220 Package Outline Data



Symbol	Dimensions (unit:mm)			Symbol	Dimensions (unit:mm)		
	Min	Typ	Max		Min	Typ	Max
A	4.30	4.55	4.75	E	9.65	10.00	10.25
A1	1.15	1.30	1.45	E3	7.00	--	--
A2	2.20	2.40	2.60	e	2.54 BSC		
b	0.70	0.80	0.95	e1	5.08 BSC		
b2	1.17	1.27	1.47	H1	6.30	6.50	6.80
c	0.40	0.50	0.65	L	12.70	13.50	14.10
D	15.30	15.60	15.90	L1	--	3.20	3.95
D1	8.90	9.10	9.35	ϕ P	3.40	3.60	3.80
D2	5.50	--	--	Q	2.60	2.80	3.00

印字说明

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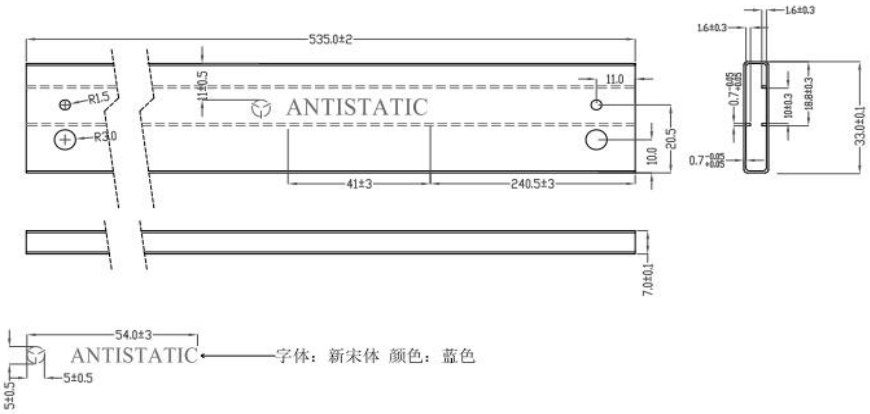
FSH20N092KE AABBCC

第一行标记为物料型号代码

第二行为AA为内部识别码，BB为表示年份，例如22即表示2022年，CC表示周期，例如01即表示第一周;2201即表示2022年第一周生产。

包装说明



封装形式	包装方式	只/料条	捆/盒	料条/捆	只/内盒	内盒/箱	只/箱
TO-220	料条	50	2	10	1000	5	5000