

Rev.A Apr.-2025

TO-220FL N 650V

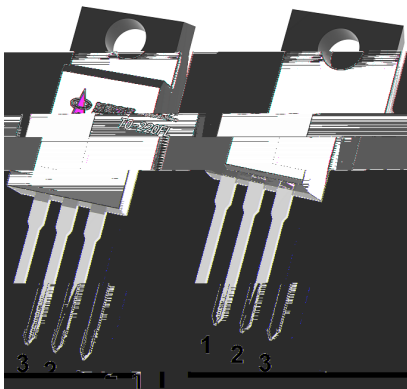
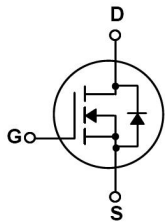
N-CHANNEL 650V Super-Junction Power MOSFET in a TO-220FL Plastic Package.

$R_{DS(on)} \times Q_g$ 100%

ROHS

Very low $R_{DS(on)} \times Q_g$, 100% avalanche tested, RoHS compliant, HF Product.

For switch mode power supply, uninterruptible power supply, power factor correction.



PIN1 G

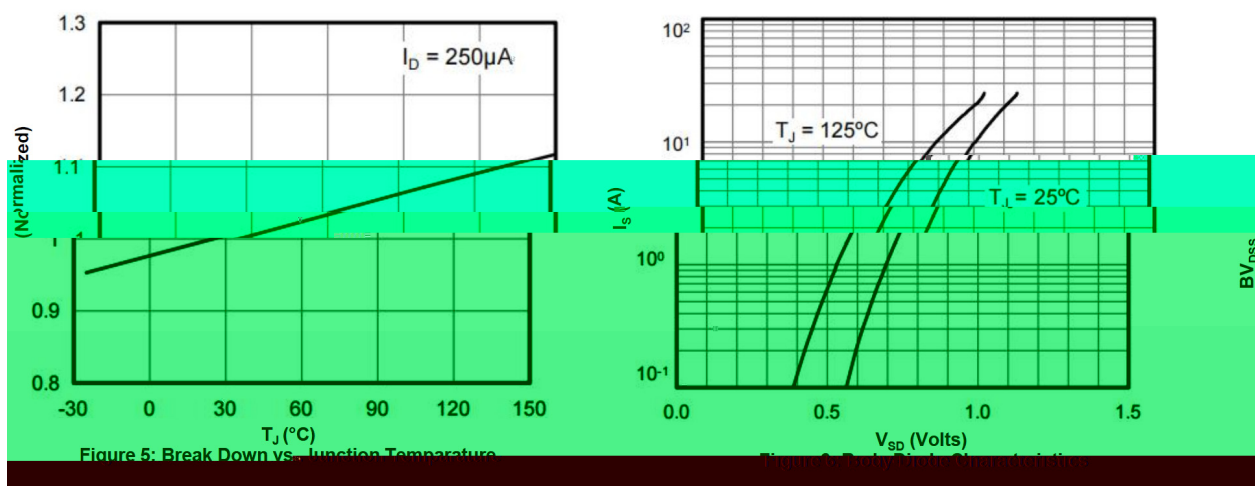
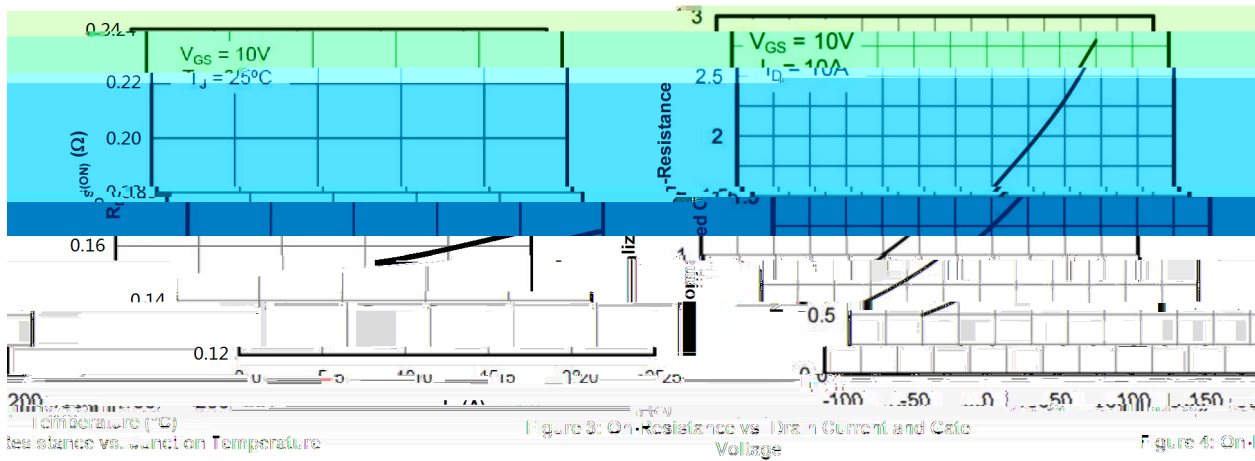
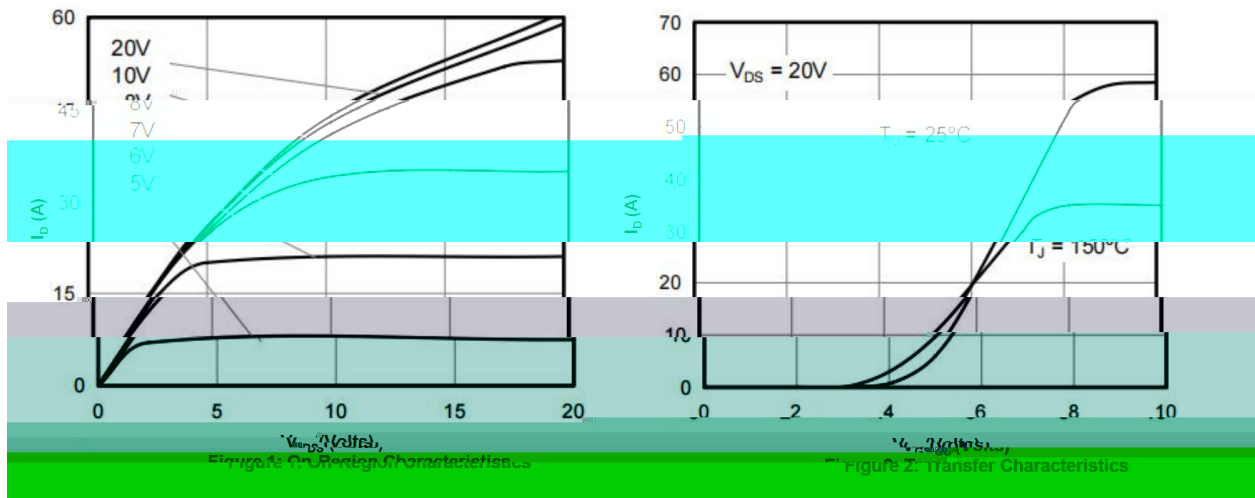
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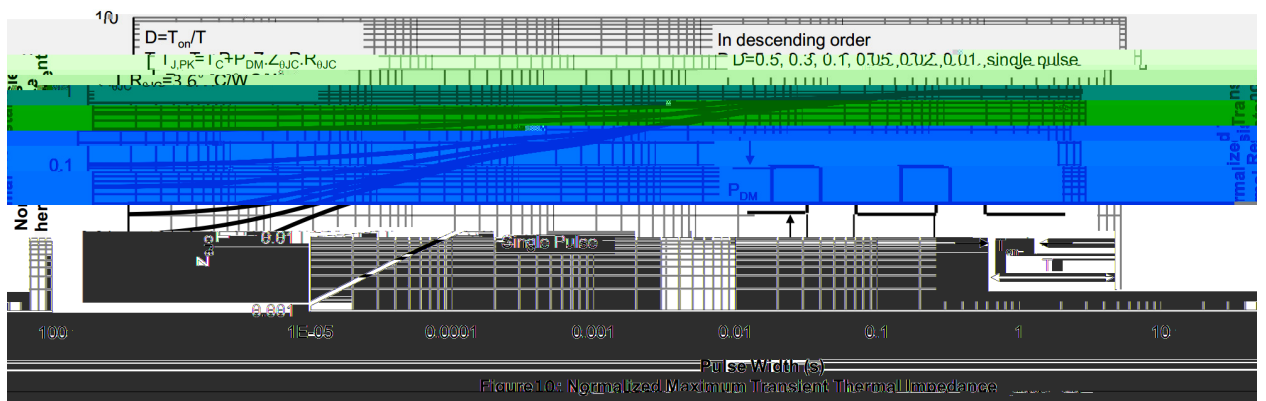
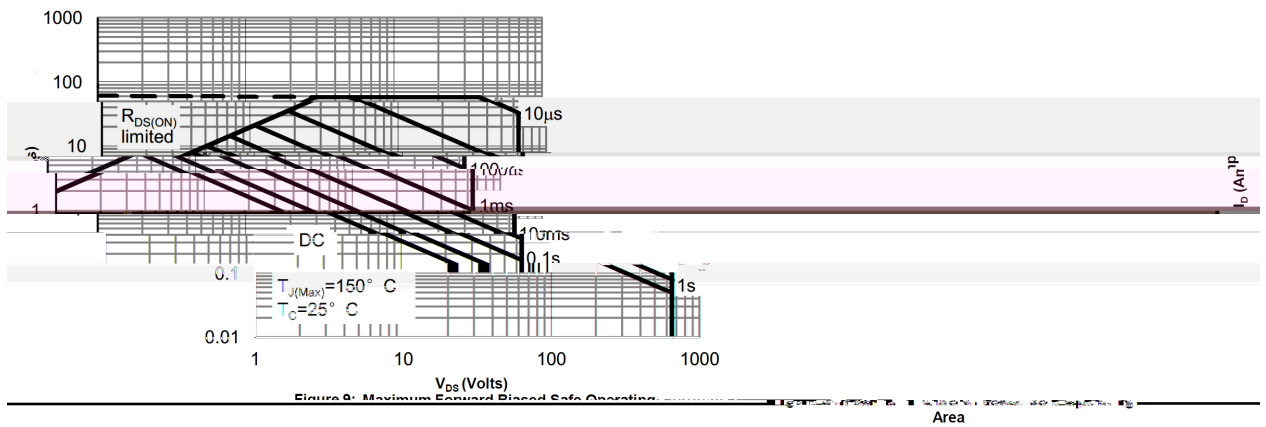
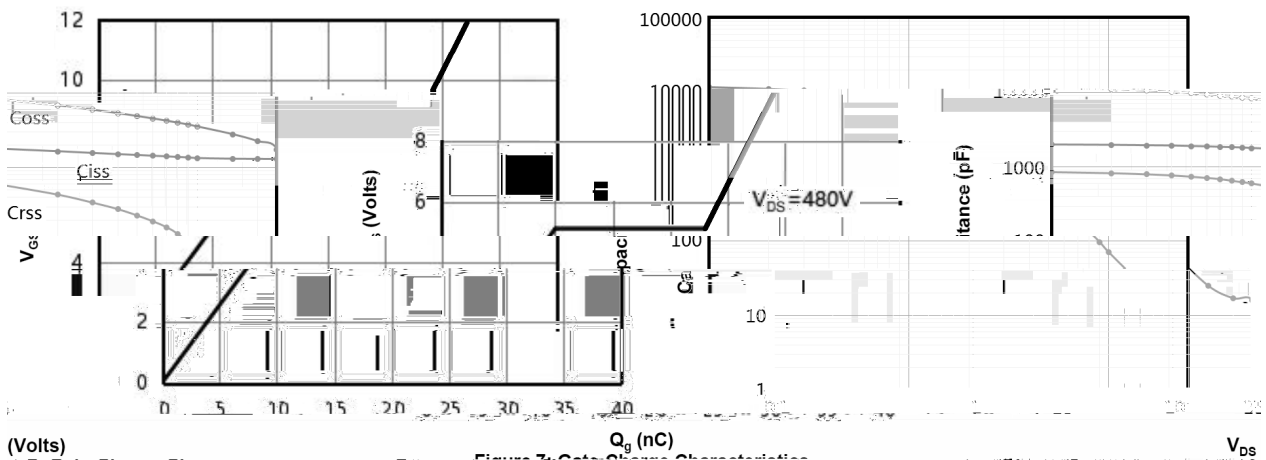
PIN 3 S

See Marking Instructions.

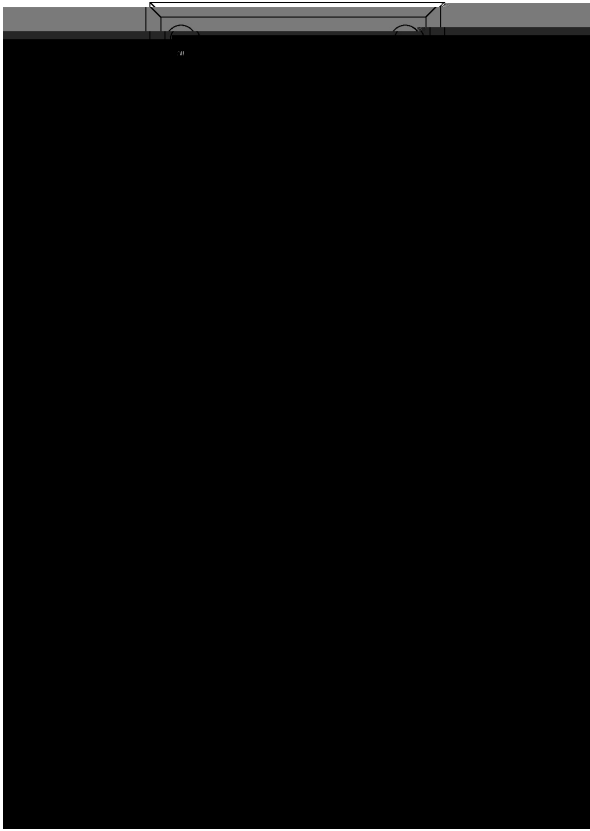
Parameter	Symbol	Rating	Unit
Drain-Source Voltage	V_{DS}	650	V
Drain Current	$I_D(T_C=25^\circ\text{C})$	20	A
Drain Current - Pulsed	I_{DM}	60	A
Gate-Source Voltage	V_{GS}	± 30	V
Single Pulsed Avalanche Energy	E_{AS}	478.6	mJ
Avalanche Current	I_{AS}	9.4	A
Power Dissipation	$P_D(T_C=25^\circ\text{C})$	34	W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to 150	
Junction-to-Case	$R_{\theta JC}$	3.6	/W
Junction-to-Ambient	$R_{\theta JA}$	80	/W

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	BV_{DS}	$V_{GS}=0V$ $I_D=250\mu A$	650			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS}=650V$ $V_{GS}=0V$ $T_J=25^\circ\text{C}$			1.0	μA
Gate-Body Leakage Current, Forward	I_{GSS}	$V_{GS}=\pm 30V$			± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$ $I_D=250\mu A$	2.0		4.0	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS}=10V$ $I_D=10A$		150	190	m Ω
Drain-Source Diode Forward Voltage	V_{SD}	$V_{GS}=0V$ $I_{SD}=1A$ $T_J=25^\circ\text{C}$			1.2	V
Gate Resistance	R_g	$V_{GS}=0V$ $f=1.0\text{MHz}$		14.6		Ω
Input Capacitance	C_{iss}	$V_{DS}=25V$ $V_{GS}=0V$ $f=1.0\text{MHz}$		1300		pF
Output Capacitance	C_{oss}			1700		pF
Reverse Transfer Capacitance	C_{rss}			9.5		pF
Turn-On Delay Time	$t_{d(on)}$	$V_{DS}=400V$ $I_D=10A$ $R_G=25\Omega$ $V_{GS}=10V$		70.2		ns
Turn-On Rise Time	t_r			27.9		
Turn-Off Delay Time	$t_{d(off)}$			135.4		
Turn-Off Fall Time	t_f			15.8		



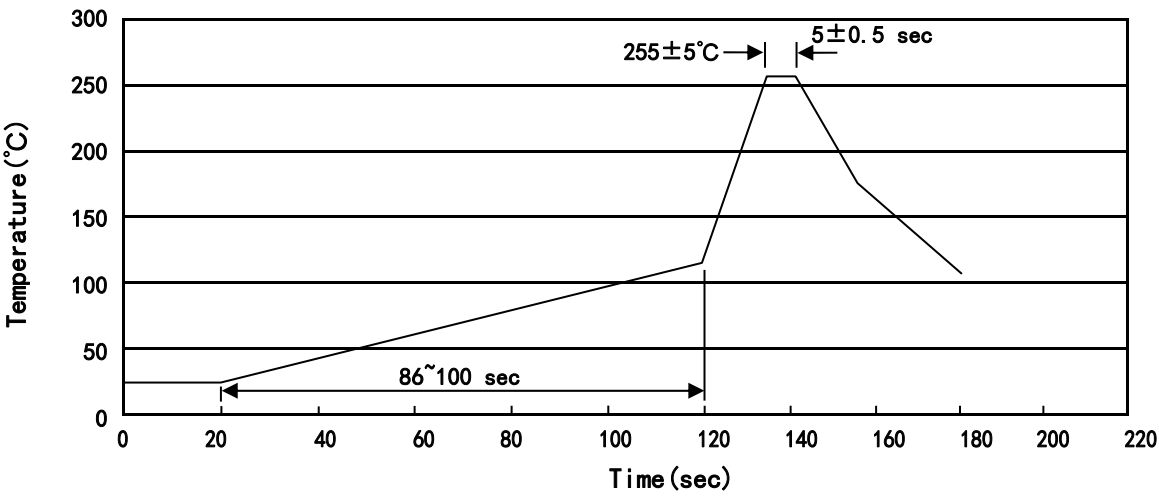


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BR
65R190T

Note:
BR: Company Code
65R190T: Product Type Code
****: Lot No. Code, code change with Lot No



Note:

- 1

25 150

60 90sec;
- 2

255±5

5±0.5sec;
- 3

2 10

/sec.
- 1.Preheating:25~150

, Time:60~90sec.
- 2.Peak Temp.:255±5

, Duration:5±0.5sec.
3. Cooling Speed: 2~10

/sec.

270±5

10±1 sec.

Temp.:270±5

Time:10±1 sec

/ TUBE

Package Type	Units					Dimension (unit mm ³)		
TO-220FL	50	20	1,000	5	5,000	532×33×7.0	555×164×50	575×290×180