

## 4A 650V N Channel MOSFET

### Features

- $V_{DS} = 650V$
- $I_D = 4A @ V_{GS} = 10V$
- $R_{DS(ON)} (Typ) = 2.4\Omega @ V_{GS} = 10V$

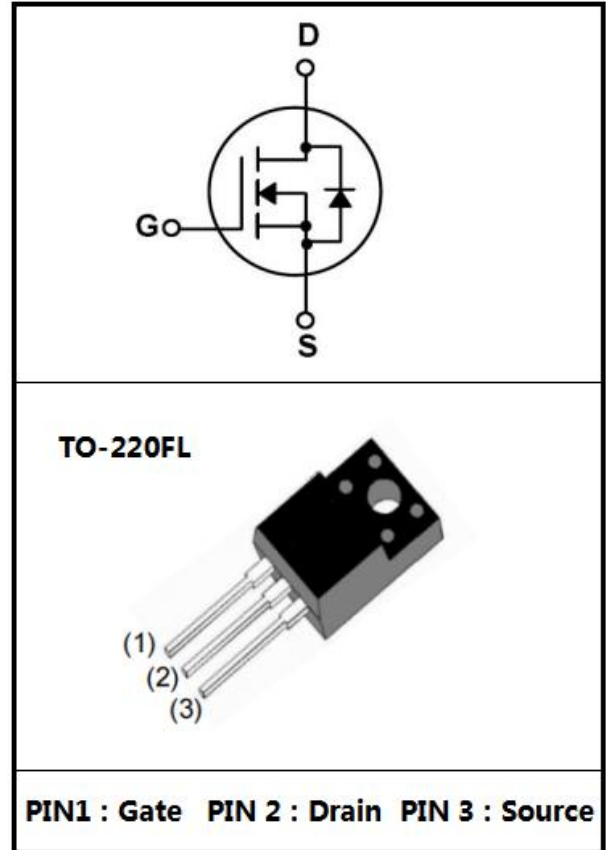
### Applications

- Power Supply
- PFC
- High Current, High Speed Switching

### Descriptions

These N-channel MOSFET are produced using advanced plane MOSFET Technology, which provides Low on-state resistance, high switching performance and excellent quality.

These devices are suitable device for SMPS, high Speed switching and general purpose applications.



**Absolute Maximum Ratings(Ta=25°C)**

Parameter	Symbol	Rating	Unit
Drain-Source Voltage	$V_{DS}$	650	V
Drain Current	$I_D(T_C=25^\circ\text{C})$	4.0	A
Drain Current	$I_D(T_C=100^\circ\text{C})$	2.5	A
Drain Current - Pulsed	$I_{DM}$	16	A
Gate-Source Voltage	$V_{GS}$	$\pm 30$	V
Single Pulsed Avalanche Energy	$E_{AS}$	240	mJ
Repetitive Avalanche Energy	$E_{AR}$	10	mJ
Avalanche Current	$I_{AR}$	4.0	A
Power Dissipation	$P_D(T_C=25^\circ\text{C})$	33	W
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to 150	$^\circ\text{C}$
Junction to Ambient	$R_{\theta JA}$	62.5	$^\circ\text{C/W}$
Junction to Case	$R_{\theta JC}$	3.7	$^\circ\text{C/W}$

**Electrical Characteristics(Ta=25°C)**

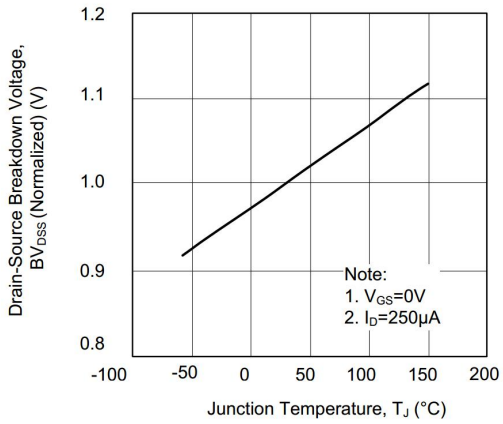
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V$ $I_D=250\mu A$	650			V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=650V$ $V_{GS}=0V$			1	$\mu A$
		$V_{DS}=480V$ $T_C=125^\circ\text{C}$			100	$\mu A$
Gate-Body Leakage Current Forward	$I_{GSS}$	$V_{GS}=\pm 30V$ $V_{DS}=0V$			$\pm 100$	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	$R_{DS(on)}$	$V_{GS}=10V$ $I_D=2.0A$		2.4	2.7	$\Omega$
Input Capacitance	$C_{iss}$	$V_{DS}=25V$ $V_{GS}=0V$ $f=1.0\text{MHz}$		700		pF
Output Capacitance	$C_{oss}$			70		
Reverse Transfer Capacitance	$C_{rss}$			20		
Total Gate Charge	$Q_G$	$V_{DS}=520V, I_D=4.0A,$ $V_{GS}=10V$		102		nC
Gate-Source Charge	$Q_{GS}$			18		
Gate-Drain Charge	$Q_{GD}$			22		

**Electrical Characteristics(Ta=25°C)**

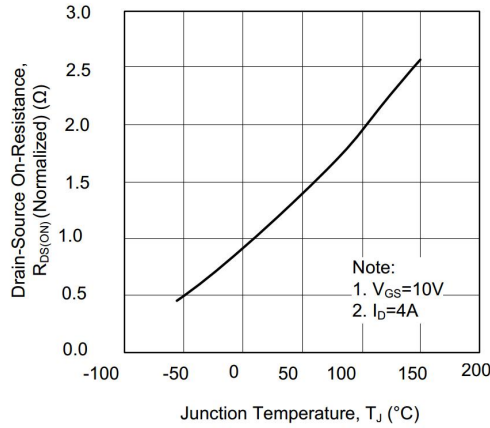
Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Turn-On Delay Time	$t_{d(on)}$	$V_{DD}=325V \quad I_D=4.0A$ $R_C=25\Omega$		48		ns
Turn-On Rise Time	$t_r$			102		
Turn-Off Delay Time	$t_{d(off)}$			205		
Turn-Off Fall Time	$t_f$			134		
Maximum Continuous Drain-Source Diode Forward Current	$I_S$				4.0	A
Maximum Pulsed Drain-Source Diode Forward Current	$I_{SM}$				16	A
Drain-Source Diode Forward Voltage	$V_{SD}$	$V_{GS} = 0V, \quad I_S = 4.0A$			1.4	V
Reverse Recovery Time	$t_{rr}$	$V_{GS} = 0V, \quad I_S = 4.4A,$ $di_F/dt = 100 A/\mu s$		250		nS
Reverse Recovery Charge	$Q_{rr}$			1500		nC

..

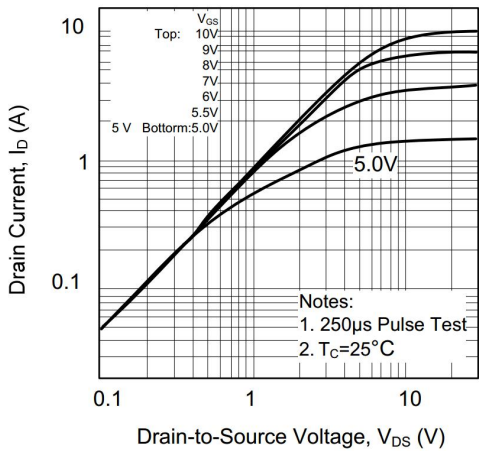
Electrical Characteristic Curve



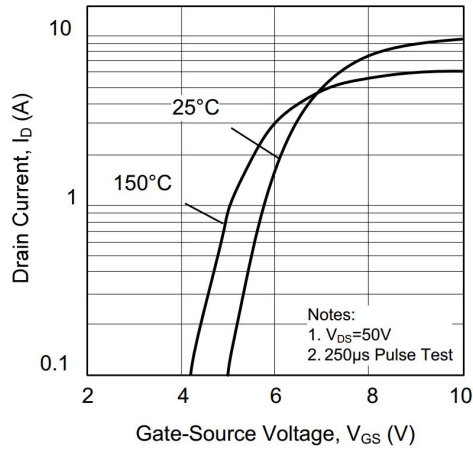
1. Breakdown Voltage Variation vs. Temperature



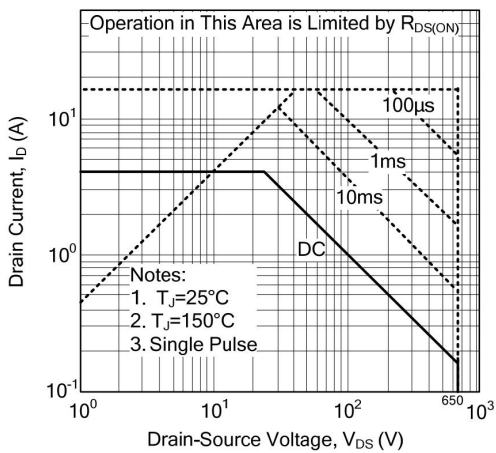
2. On-Resistance Junction Temperature



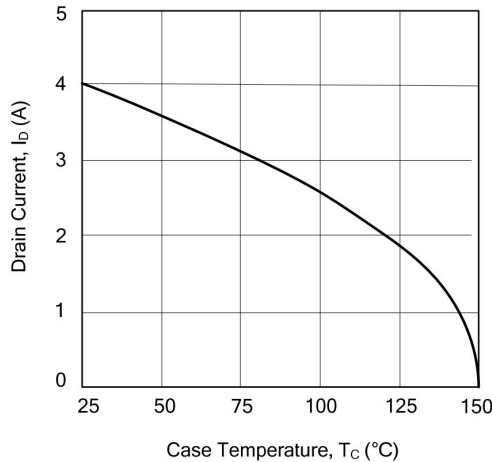
3. On-State Characteristics



4. Transfer Characteristics

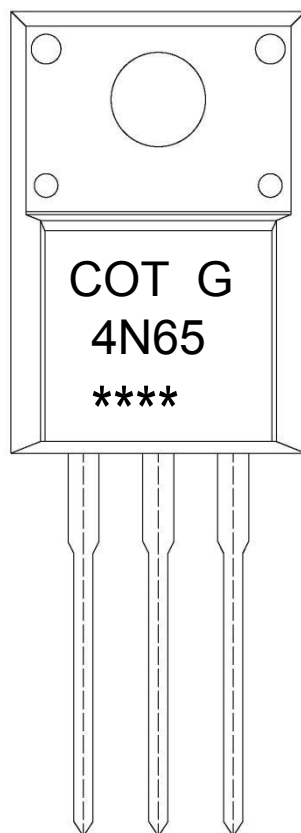


5. Safe Operating Area



6. Maximum Drain Current vs. Case Temperature

Marking Instructions



Note:

COT: Company Logo

G: Halogen Free

4N65: Product Type.

\*\*\*\*: Lot No. Code, code change with Lot No.

Packaging SPEC.

TUBE INFORMATION

Package Type	Units					Dimension (unit: mm <sup>3</sup> )		
	Units/Tube	Tubes/Inner Box	Units/Inner Box	Inner Boxes/Outer Box	Units/Outer Box	Tube	Inner Box	Outer Box
TO-220FL	50	20	1,000	5	5,000	532×33×7.0	555×164×50	575×290×180

Package Dimensions

TO-220FL

单位: mm

