

### Product Summary

$V_{(BR)DSS}$	$R_{DS(on)TYP}$	$I_D$
650V	150mΩ@10V	20A

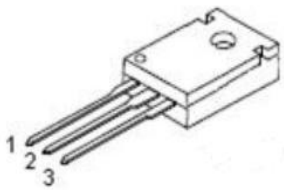
### Feature

- Fast Switching
- Low Gate Charge and Rds(on)
- 100% Single Pulse avalanche energy Test

### Applications

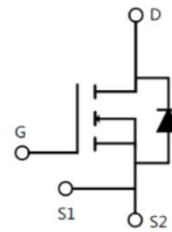
- PD charger
- Large screen display
- Telecom power
- Server power

### Package

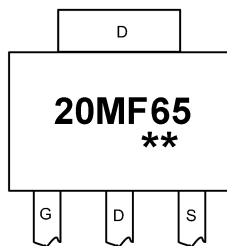


TO-247(1:G 2:D 3:S)

### Circuit diagram



### Marking



20MF65 : Product code  
\*\* : Week code

**Absolute maximum ratings (Ta=25°C, unless otherwise noted)**

Parameter	Symbol	Rating	Unit
Drain source voltage	$V_{DS}$	650	V
Gate source voltage	$V_{GS}$	$\pm 30$	V
Continuous drain current(Tc=25°C)	$I_D$	20	A
Continuous drain current(Tc=100°C)	$I_D$	12.5	A
Pulsed drain current	$I_{DM}$	80	A
Power dissipation(Tc=25°C)	$P_D$	34	W
Single pulsed avalanche energy1)	$E_{AS}$	578	mJ
Thermal resistance, junction-case	$R_{\theta JC}$	3.68	°C/W
Operation and storage temperature	$T_{stg}, T_j$	-55 to 150	°C

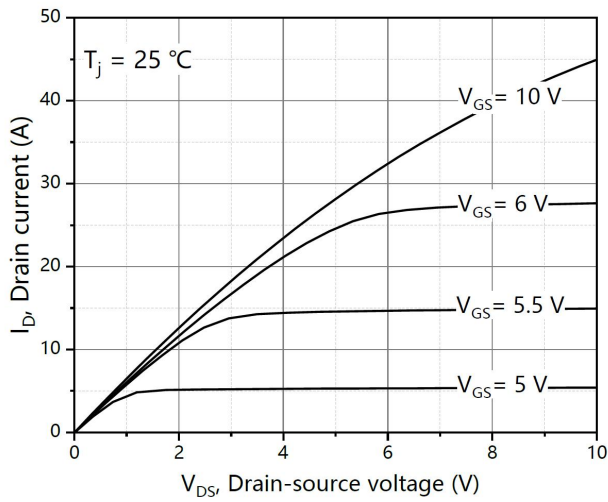
**Electrical characteristics (Ta=25°C, unless otherwise noted)**

Characteristics	Symbol	Test Condition	Min	Typ	Max	Unit
<b>Static Characteristics</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$I_D = 250\mu A, V_{GS} = 0V$	650	-	-	V
Drain Cut-Off Current	$I_{DSS}$	$V_{DS} = 520V, V_{GS} = 0V$	-	-	1	$\mu A$
Gate Leakage Current	$I_{GSS}$	$V_{GS} = \pm 30V, V_{DS} = 0V$	-	-	$\pm 0.1$	
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS} = V_{GS}, I_D = 250\mu A$	2.5	3.5	4.5	V
Drain-Source ON Resistance	$R_{DS(ON)}$	$V_{GS} = 10V, I_D = 10A$	-	150	190	m $\Omega$
<b>Dynamic Characteristics</b>						
Input Capacitance	$C_{iss}$	$V_{DS} = 50V, V_{GS} = 0V, f = 1.0MHz$	-	1745	-	pF
Output Capacitance	$C_{oss}$		-	102	-	
Reverse Transfer Capacitance	$C_{rss}$		-	2.5	-	
<b>Switching Characteristics</b>						
Total Gate Charge	$Q_g$	$V_{DS} = 400V, V_{GS} = 10V, I_D = 10A$	-	45.5	-	nC
Gate-Source Charge	$Q_{gs}$		-	10.5	-	
Gate-Drain Charge	$Q_{gd}$		-	9	-	
Turn-On Delay Time	$t_{d(on)}$	$V_{GS} = 10V, V_{DS} = 400V, I_D = 10A, R_G = 2\Omega$	-	31	-	ns
Rise Time	$t_r$		-	20	-	
Turn-Off Delay Time	$t_{d(off)}$		-	83	-	
Fall Time	$t_f$		-	9	-	
<b>Drain-Source Body Diode Characteristics</b>						
Source-Drain Diode Forward Voltage	$V_{SD}$	$I_S = 1A, V_{GS} = 0V$	-	-	1.2	V
Reverse Recovery Time	$T_{rr}$	$V_R = 400V, I_S = 10A, di/dt = 100A/\mu s$		190		ns

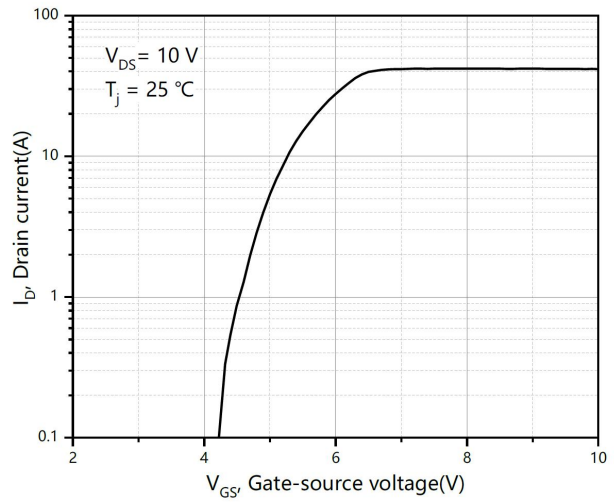
Note:

- $E_{AS}$  is tested at starting  $T_j = 25^\circ C, V_{DD} = 100V, V_{GS} = 10V, L = 0.5mH, R_g = 25\Omega;$

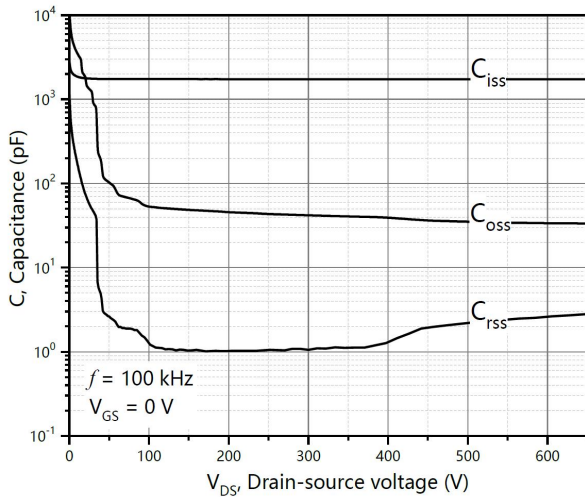
**Typical Characteristics**



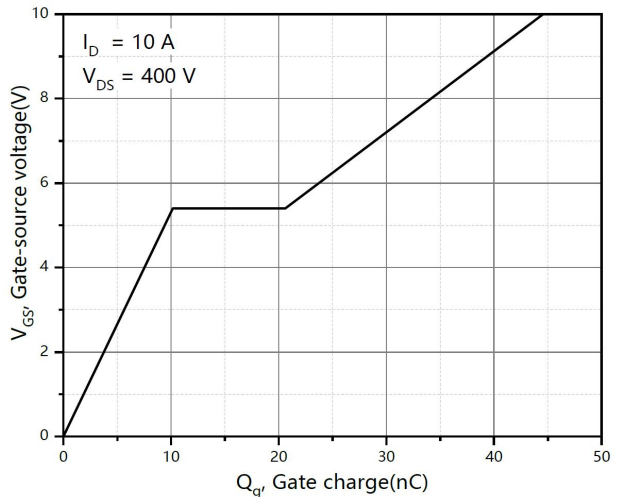
**Typ. output characteristics**



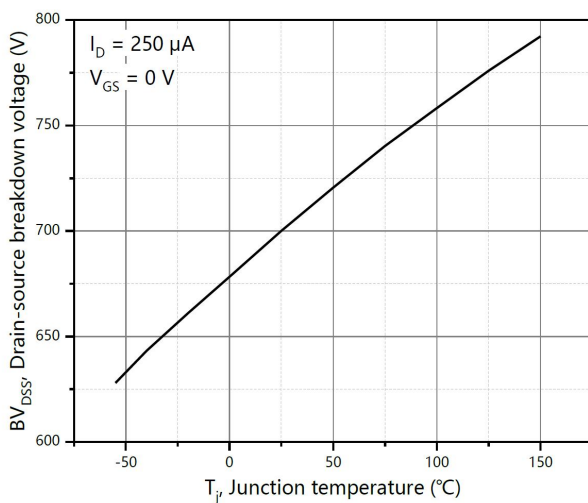
**Typ. transfer characteristics**



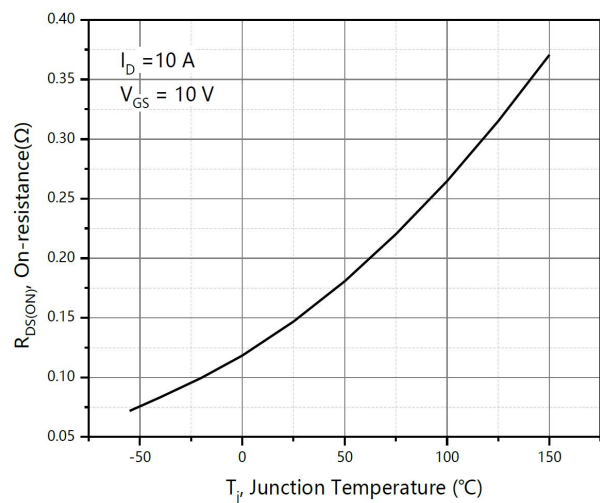
**Typ. capacitances**



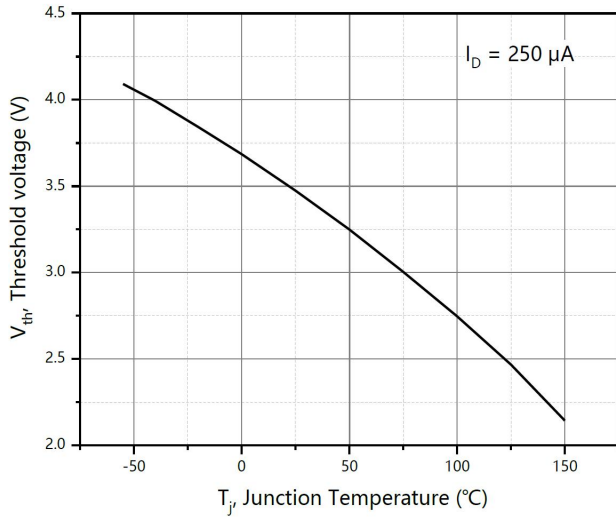
**Typ. gate charge**



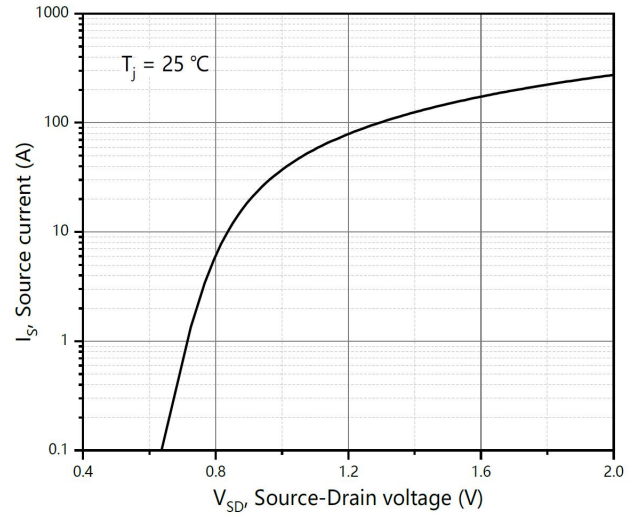
**Drain-source breakdown voltage**



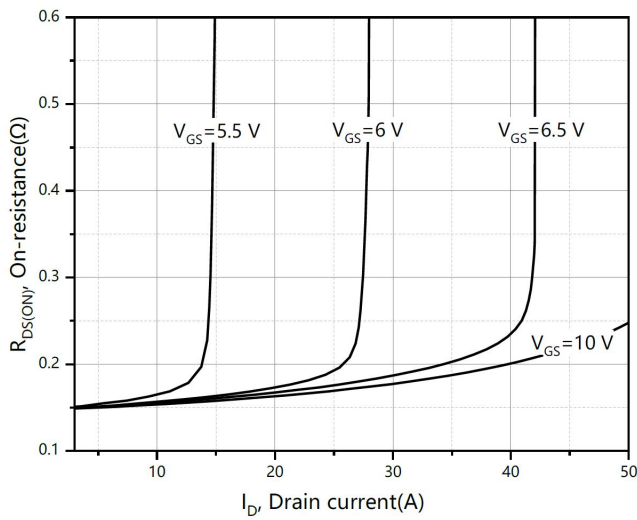
**Drain-source on-state resistance**



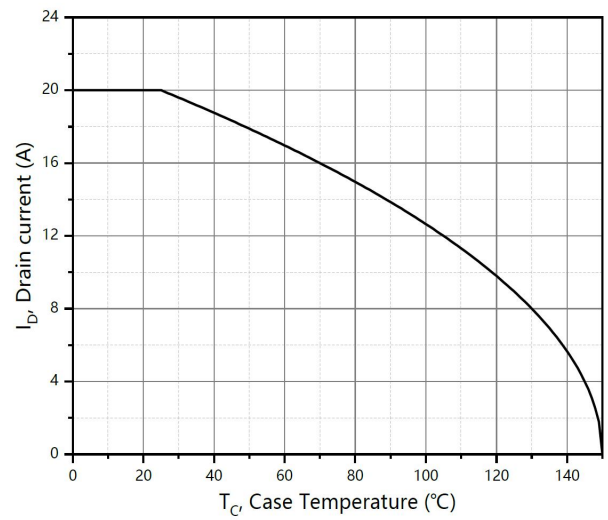
**Threshold voltage**



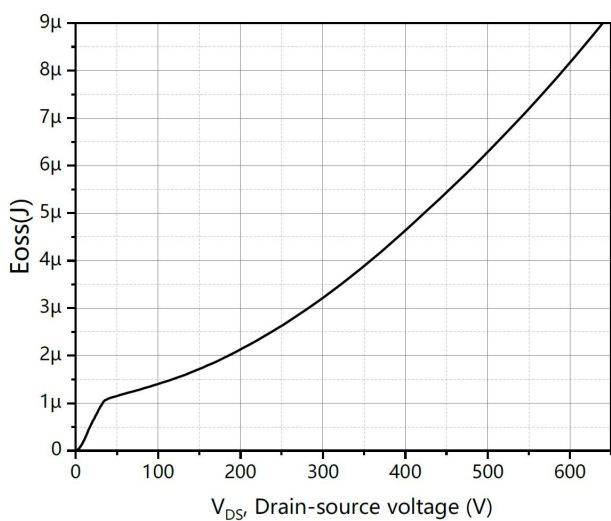
**Forward characteristic of body diode**



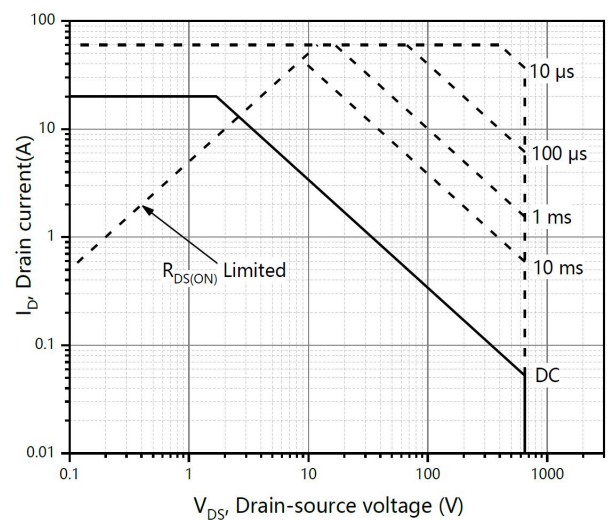
**Drain-source on-state resistance**



**Drain current**



**Safe operation area T<sub>c</sub>=25 °C**



**Safe operation area T<sub>c</sub>=25 °C**



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