

1.Description

This N-channel MOSFET is produced by process,which is specially designed to minimize the on resistance and maintain excellent switching performance.

2.2Features

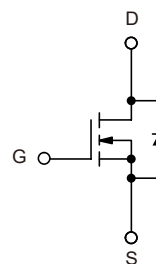
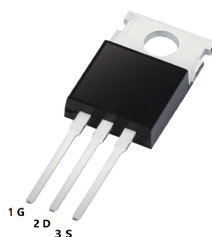
- High power and high current handling capacity
- High performance channel technology can achieve very low $R_{DS(ON)}$.

2.1Features

- $V_{DS(V)}=100V$
- $I_D=164A$
- $R_{DS(ON)}<3.8m\Omega(V_{GS}=10V)$

3.Pinning information

Pin	Symbol	Description
1	G	GATE
2	D	SOURCE
3	S	DRAIN



4.Absolute Maximum Ratings $T_c = 25^\circ C$

Parameter	Symbol	Rating	Units
Drain to Source Voltage	V_{DSS}	100	V
Gate to Source Voltage	V_{GSS}	± 20	V
Drain Current - Continuous $T_c=25^\circ C$ (Silicon Limited)	I_D	164*	A
- Continuous $T_c=100^\circ C$ (Silicon Limited)		116	A
- Continuous $T_c=25^\circ C$ (packaging limit)		120	A
- Pulsed (Note 1)	I_{DM}	656	A
Single Pulse Avalanche Energy (Note 2)	E_{AS}	637	mJ
Diode restores dv/dt peak value (Note 3)	dv/dt	6	V/ns
Power consumption $T_c=25^\circ C$	P_D	263	W
Power consumption - Reduce to above $25^\circ C$		1.75	W/ $^\circ C$



Storage Temperature Range	T_J, T_{STG}	-55 to 175	°C
Maximum Lead Temperature for Soldering, 1/8" from Case for 5 Seconds	T_L	300	°C

5.Thermal Characteristics

Parameter	Symbol	Rating	Units
Maximum junction-to- shell thermal resistance	$R_{\theta JC}$	0.57	°C/W
Maximum junction-to- ambient thermal resistance	$R_{\theta JA}$	62.5	°C/W

* Calculate the continuous current (based on the maximum allowable junction temperature). The current limit of the package is 120 A.



6. Electrical Characteristic (T_J=25°C unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Drain to Source Breakdown Voltage	BV _{DSS}	I _D =250μA, V _{GS} =0V	100			V
Temperature coefficient of breakdown voltage	$\frac{\Delta BV_{DSS}}{\Delta T_J}$	I _D =250μA Referenced to 25°C		0.07		V/°C
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} =80V, V _{GS} =0V			1	μA
		V _{DS} =80V, T _J =150°C			500	μA
Gate- body leakage current	I _{GSS}	V _{GS} =±20V, V _{DS} =0V			±100	nA
Gate threshold voltage	V _{GS(th)}	V _{DS} =V _{GS} , I _D =250μA	2		4	V
Static on-resistance from drain to source	R _{DS(ON)}	V _{GS} =10V, I _D =100A		3.8	4.5	mΩ
Forward transconductance	g _{FS}	V _{DS} =10V, I _D =100A		132		S
Input capacitance	C _{iss}	V _{DS} =50V, V _{GS} =0V, f=1MHz		3960	5270	pF
output capacitance	C _{oss}			925	1230	pF
Reverse transmission capacitance	C _{rss}			34		pF
Energy-dependent output capacitance	C _{oss(er)}	V _{DS} =50V, V _{GS} =0V		1520		pF
Total gate charge of 10 V	Q _{g(tot)}	V _{DS} =50V, I _D =100A V _{GS} =10V (Note 4)		54	74	nC
Gate- source gate charge	Q _{gs}			17		nC
Gate platform charge threshold	Q _{gs2}			8		nC
Gate- drain "Miller" charge	Q _{gd}			13		Ω
Equivalent Series Resistance (G-S)	E _{SR}	f=1MHz		1.9		ns
Turn-On Delay Time	t _{D(on)}	V _{DD} =50V, I _D =100A V _{GS} =10V, R _G =4.7Ω (Note 4)		23	56	ns
Rise Time	t _r			26	62	ns
Turn-Off Delay Time	t _{D(off)}			50	110	ns
Fall Time	t _f			15	40	
Maximum Pulsed Drain to Source Diode Forward Current	I _S				164*	A
Maximum Pulsed Drain to Source Diode Forward Current	I _{SM}				656	A



Drain to Source Diode Forward Voltage	V_{SD}	$V_{GS}=0V, I_{SD}=100A$			1.3	V
Reverse Recovery Time	t_{rr}	$V_{GS}=0V, V_{DD}=50V, I_{SD}=100A$		75		ns
Reverse Recovery Charge	Q_{rr}	$di_F/dt=100A/\mu s$		120		nC

- 1. Repetition rating: The pulse width is limited by the maximum junction temperature.
- 2. $L=3MH, I_{AS}=20.6\text{ A}, R_G=25$, and $T_J=25^{\circ}C$.
- 3. $I_{SD}100a, di/dt\ 200a/s, V_{DD}\ BV_{DSS}$, start $TJ=25^{\circ}C$.



7.1 Typical characteristic

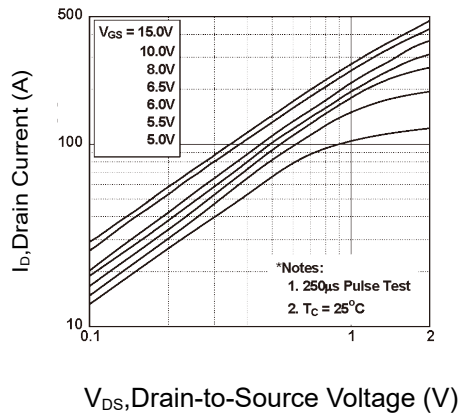


Figure 1: Conduction Region Characteristics

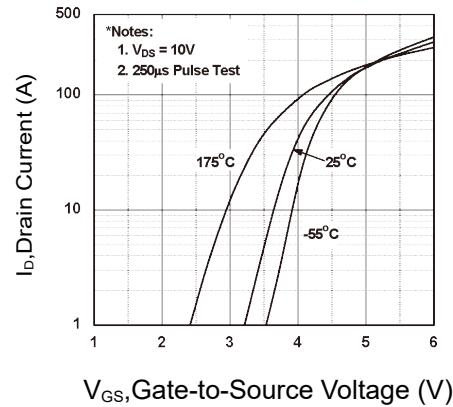


Figure 2: Transfer Characteristics

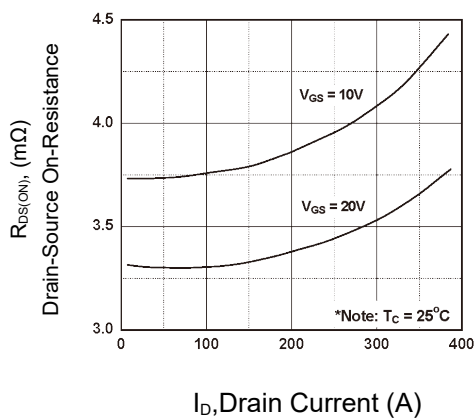


Figure 3: On - resistance variation and drain current

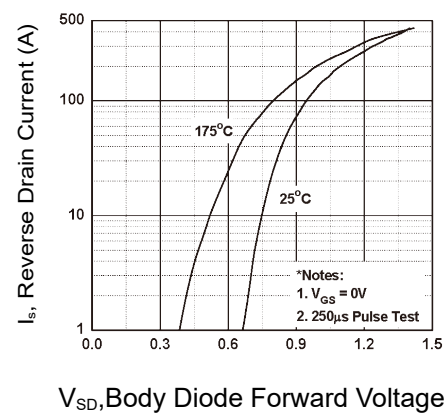


Figure 4: Relationship between direct voltage variation of body diode and source current and gate voltage

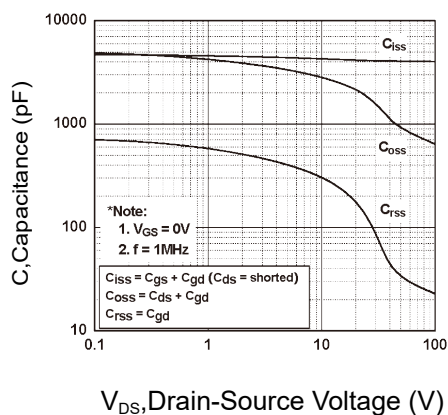


Figure 5: Capacitance Characteristics

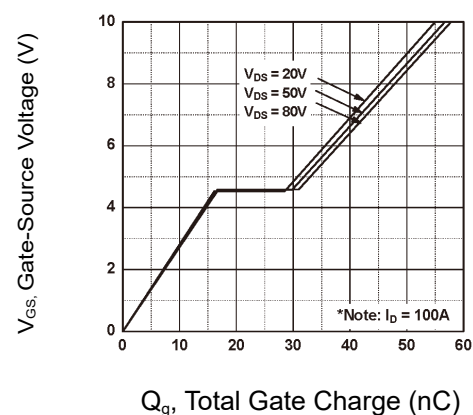
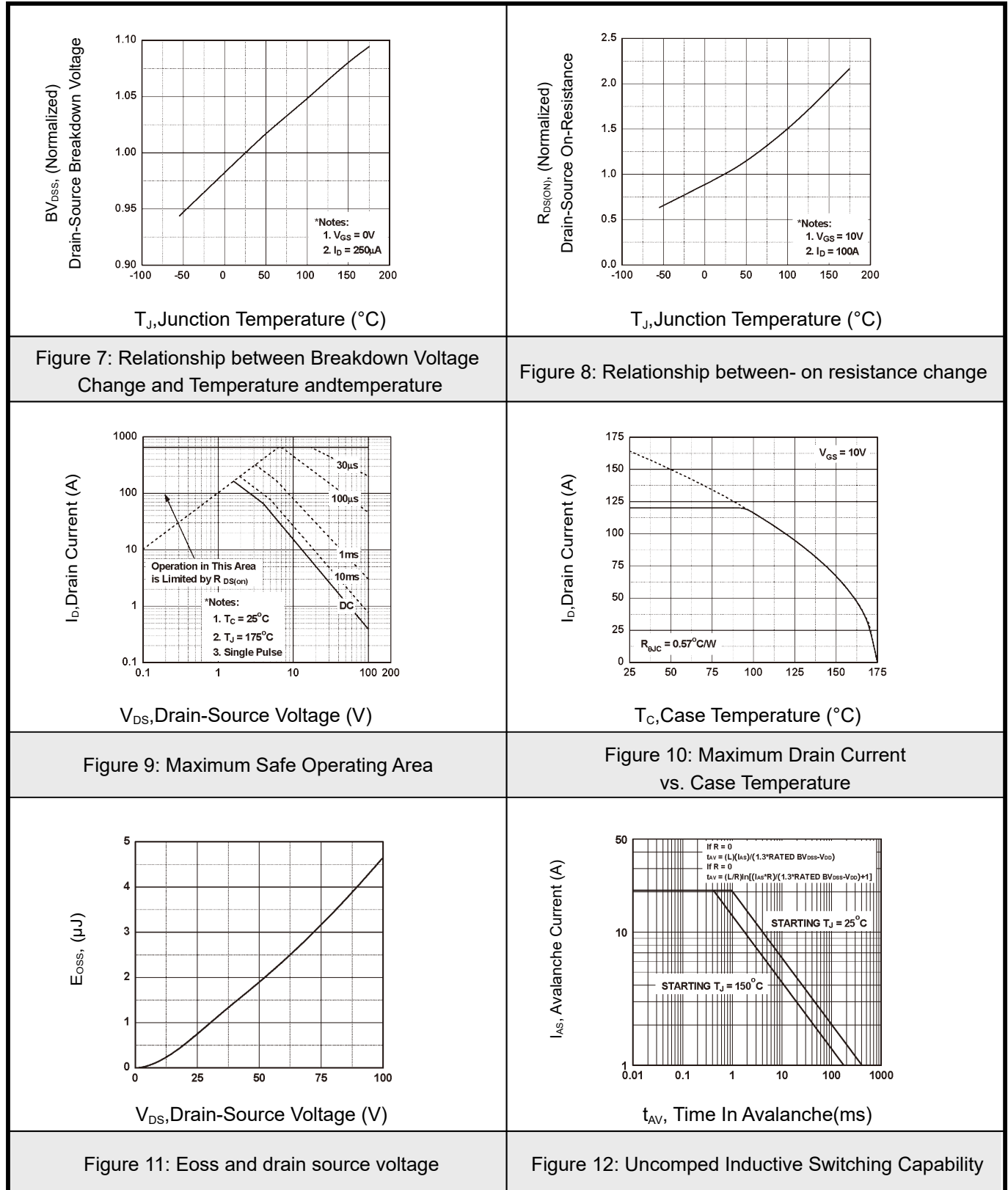


Figure 6: Gate Charge Characteristics

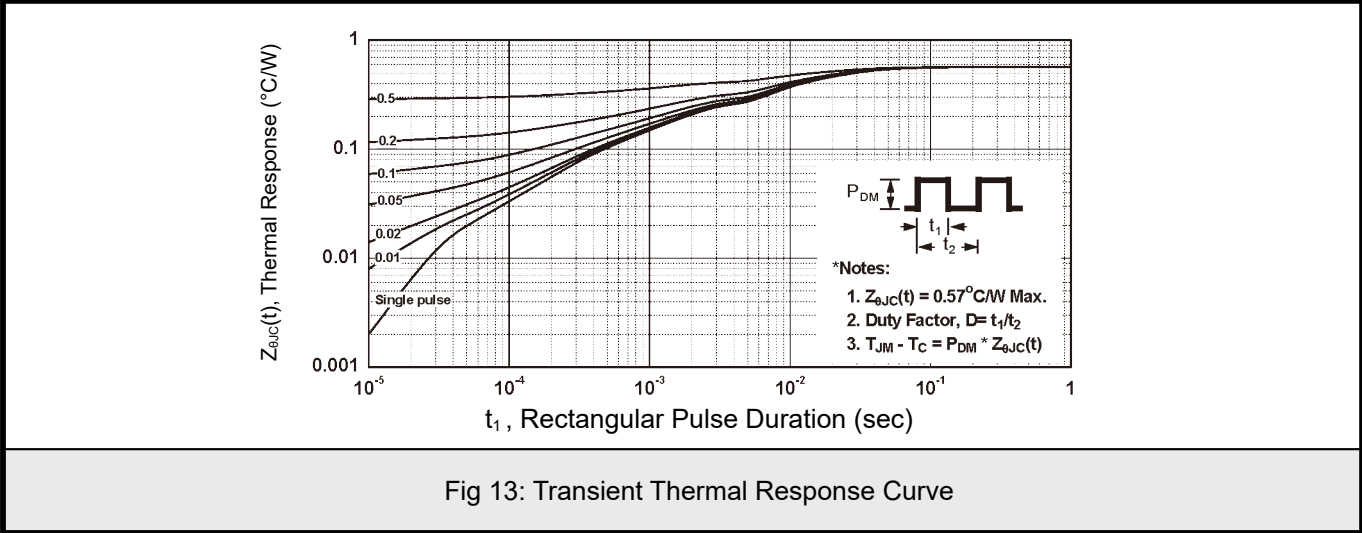


7.2 Typical characteristic



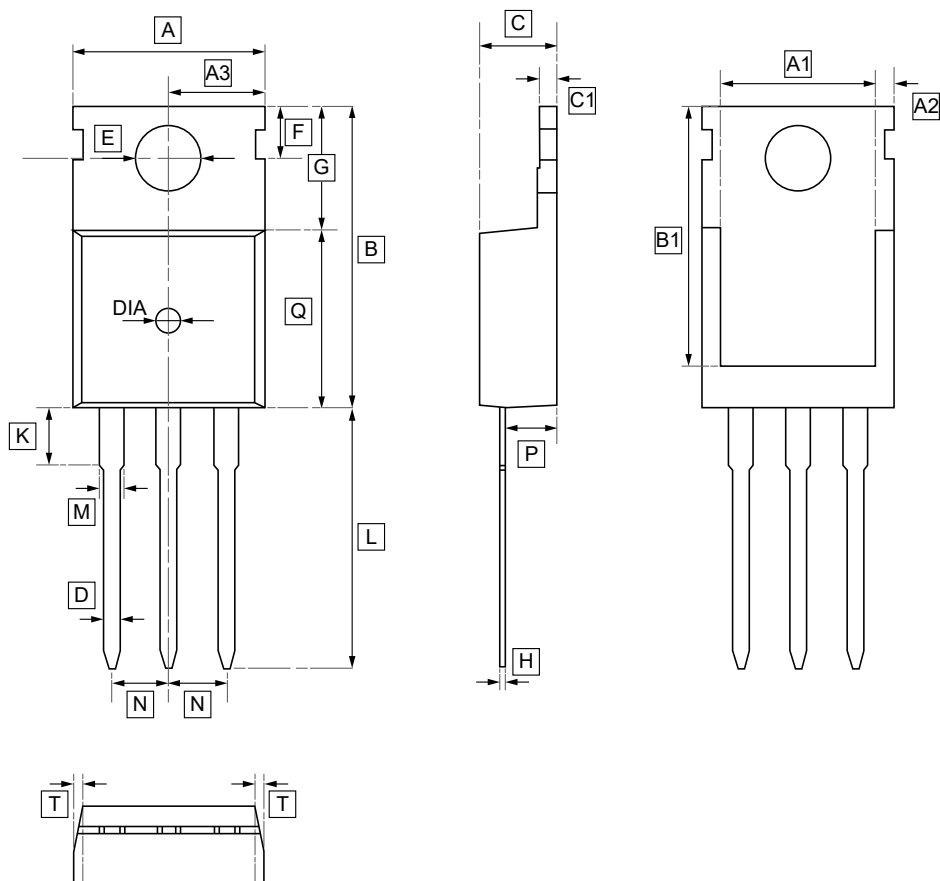


7.3Typical characteristic





8.TO-220 Package Outline Dimensions



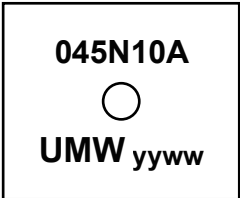
DIMENSIONS (mm are the original dimensions)

Symbol	A	A1	A2	A3	B	B1	C	C1	D	E	F	G
Min	9.7	8.44	1.05	4.8	15.4	12.9	4.28	1.1	0.6	3.4	2.65	5.2
Max	10.3	8.84	1.25	5.2	16.2	13.5	4.68	1.5	1.0	3.8	3.25	5.8

Symbol	H	K	L	L1	M	N	P	Q	T	DIA
Min	0.4	2.9	12.8	2.7	1.15	2.49	2.1	8.7	W:0.35	⌀1.5
Max	0.6	3.3	13.6	3.3	1.35	2.59	2.7	9.3		(deep 0.2)



9.Ordering information



yy: Year Code
ww: Week Code

Order Code	Package	Base QTY	Delivery Mode
UMW FDP045N10A	TO-220	1000	Tube and box



10.Disclaimer

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