

Descriptions

The CT045N03ZF uses split gate trench technology to provide excellent $R_{DS(on)}$ low gate charge. This device is suitable for power management and high efficiency applications at high switching frequencies applications.

Features

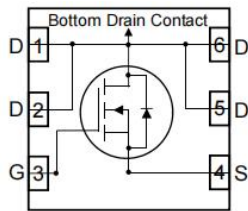
- High Power and current handling capability
- Lead free product is acquired
- Surface Mount Package

MOSFET Product Summary		
$V_{DS}(V)$	$R_{DS(on)}(m\Omega)$	$I_D(A)$
30	4.0 @ $V_{GS} = 10V$	20

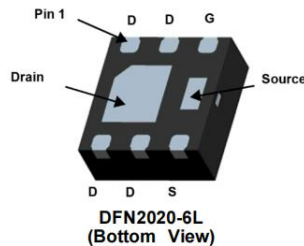
Applications

- PWM applications
- Load switch
- Power management
- DC-DC Converters
- Wireless Chargers

Equivalent Circuit & Pinning



Circuit Diagram



Absolute Maximum Ratings($T_a=25^\circ C$)

Rating	Symbol	Value	Units
Drain-source Voltage	V_{DS}	30	V
Gate-source Voltage	V_{GS}	± 20	V
Drain Current	I_D	20	A
Pulsed Drain Current ¹⁾	I_{DM}	130	A
Avalanche Energy, Single Pulse	E_{AS}	96	mJ
Total Power Dissipation ²⁾	P_D	2.4	W
Thermal Resistance Junction-to-Ambient @ Steady State ²⁾	$R_{\theta JA}$	56	$^\circ C/W$
Junction and Storage Temperature Range	T_J, T_{STG}	-55~+150	$^\circ C$

Electrical Characteristics(Ta=25°C)

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Units
Off Characteristics						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} = 0V, I _D = 250μA	30	-	-	V
Zero Gate Voltage Drain Current	I _{DSS}	V _{DS} = 30V, V _{GS} = 0V	-	-	1	μA
Gate-Body Leakage Current	I _{GSS}	V _{GS} = ±20V, V _{DS} = 0V	-	-	±100	nA
On Characteristics ³⁾						
Gate Threshold Voltage	V _{GS(th)}	V _{DS} = V _{GS} , I _D = 250μA	1.1	1.8	2.5	V
Static Drain-Source On-Resistance	R _{DS(on)}	V _{GS} = 10V, I _D = 10A	-	4.0	4.5	mΩ
		V _{GS} = 4.5V, I _D = 10A	-	6.0	8.0	
Dynamic Parameters ⁴⁾						
Input Capacitance	C _{iss}	V _{DS} = 15V, V _{GS} = 0V, f= 1MHz	-	1100	-	pF
Output Capacitance	C _{oss}		-	270	-	
Reverse Transfer Capacitance	C _{rss}		-	16	-	
Switching Parameters ⁴⁾						
Turn-on Delay Time	t _{d(on)}	V _{DD} = 15V, I _D = 10A, V _{GEN} = 10V, R _{GEN} = 3Ω	-	1.27	-	ns
Turn-on Rise Time	t _r		-	1.13	-	
Turn-Off Delay Time	t _{d(off)}		-	11.2	-	
Turn-Off Fall Time	t _f		-	4.97	-	
Total Gate Charge	Q _g	V _{DS} = 15V, I _D = 10A, V _{GS} = 4.5V	-	5.5	-	nC
Gate-Source Charge	Q _g		-	2.5	-	
Gate-Drain Charge	Q _{gd}		-	0.6	-	
Drain-Source Diode Characteristics						
Diode Forward Voltage ³⁾	V _{SD}	V _{GS} = 0V, I _S = 0.2A	-	0.65	1.5	V

Notes:

1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board, $t \leq 10$ sec.
3. Pulse Test: Pulse Width $\leq 300 \mu s$, Duty Cycle $\leq 2\%$.
4. Guaranteed by design, not subject to production

Electrical Characteristic Curve

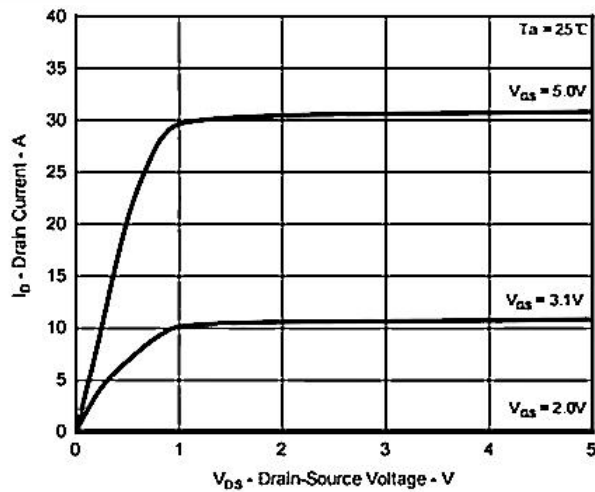


Fig.1 Output Characteristics

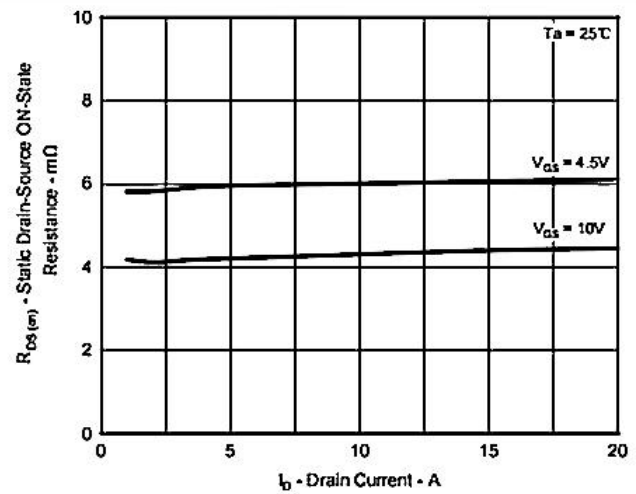


Fig.2 On-Resistance vs. Drain Current (I)

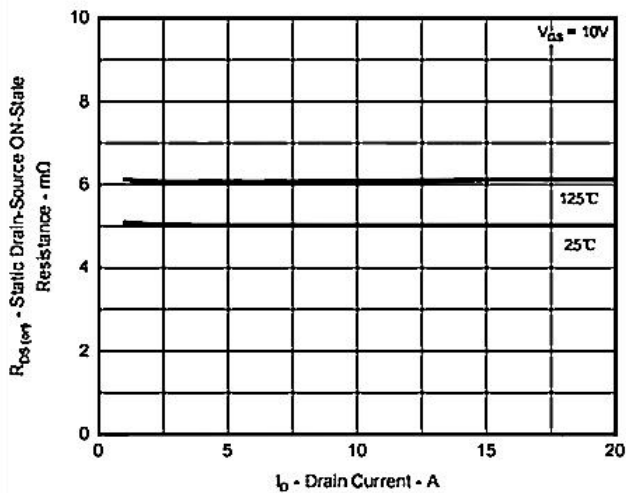


Fig.3 On-Resistance vs. Drain Current (II)

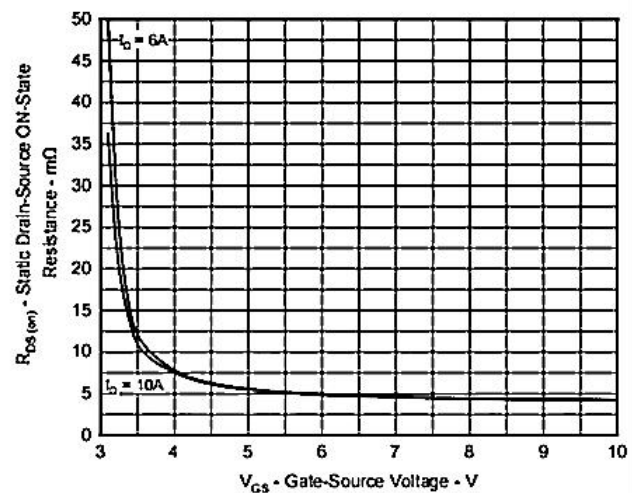


Fig.4 On-Resistance vs. Gate-Source Voltage

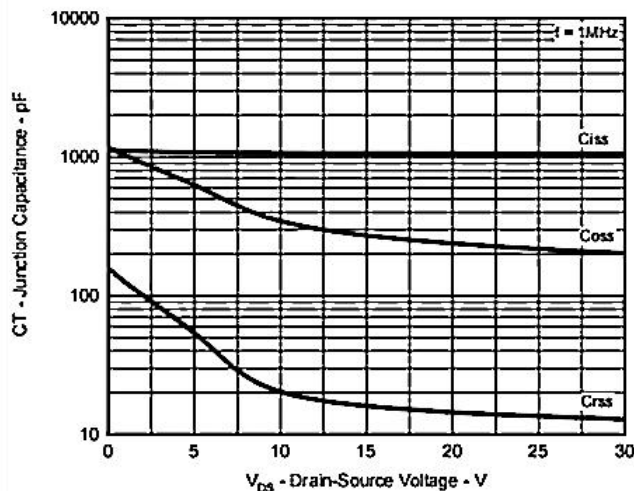


Fig.5 Typical Junction Capacitance

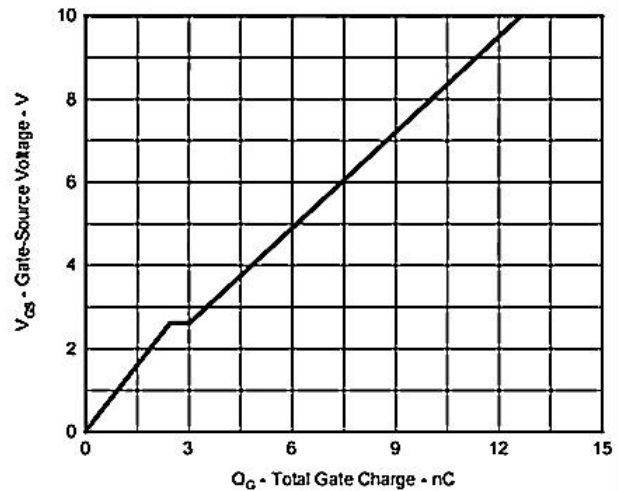


Fig.6 Gate Charge Characteristics

Electrical Characteristic Curve

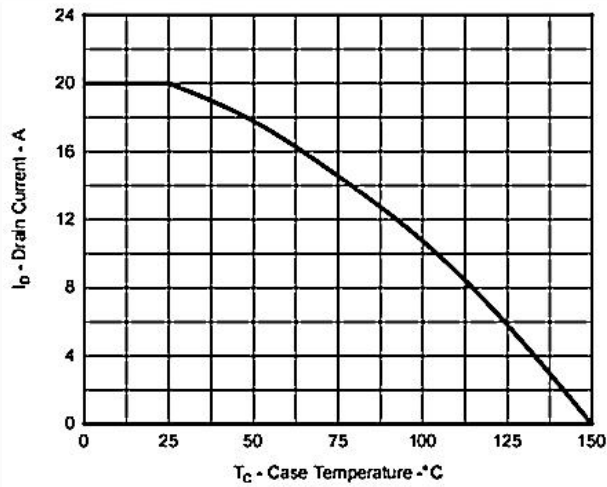


Fig.7 Maximum Drain Current vs. Case Temperature

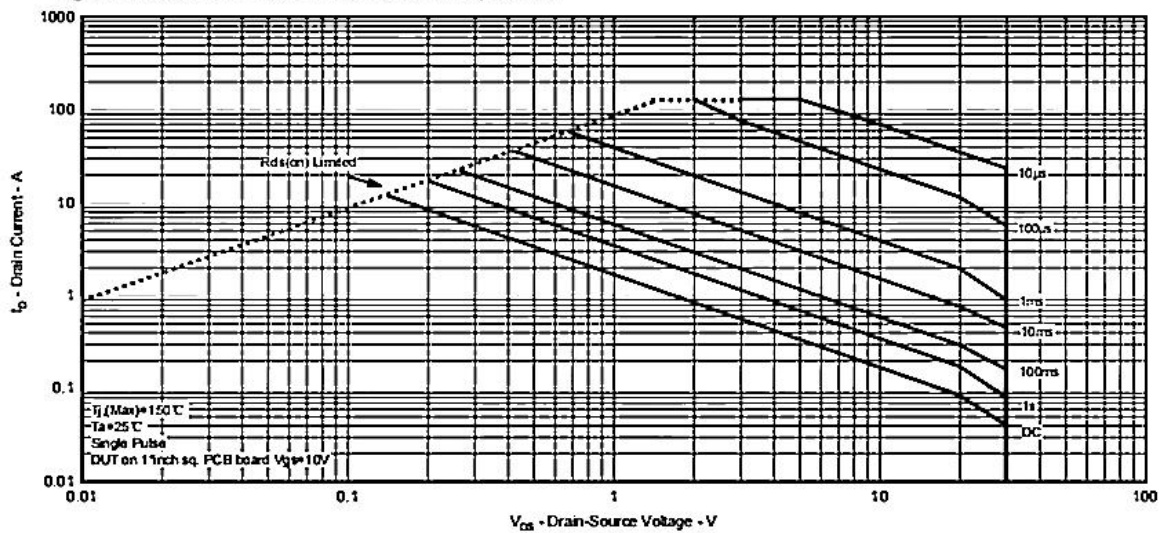


Fig.8 Safe Operation Area

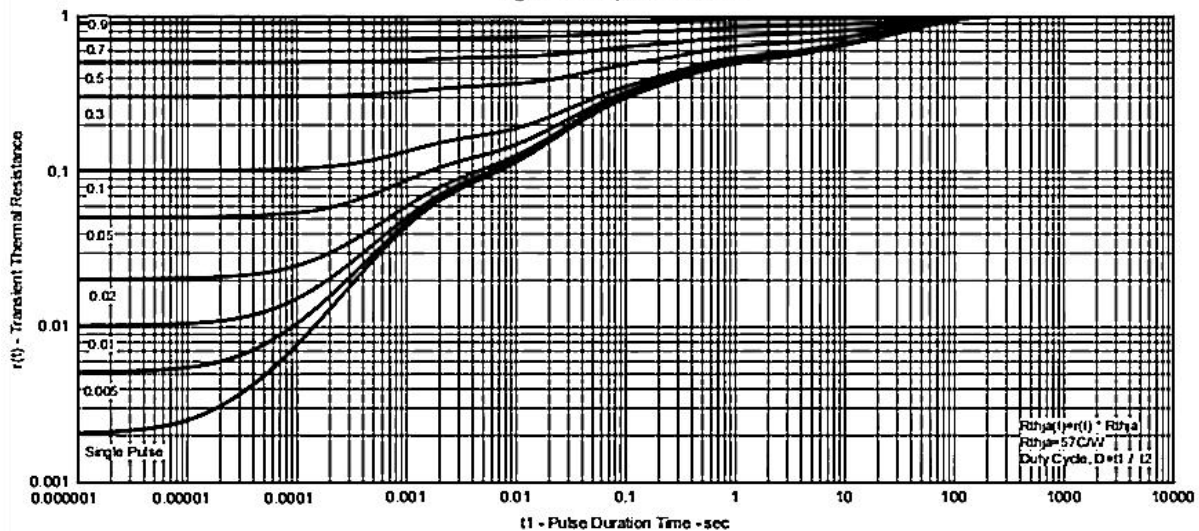
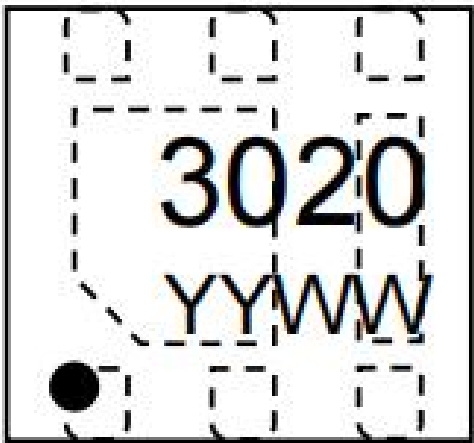


Fig.9 Transient Thermal Resistance

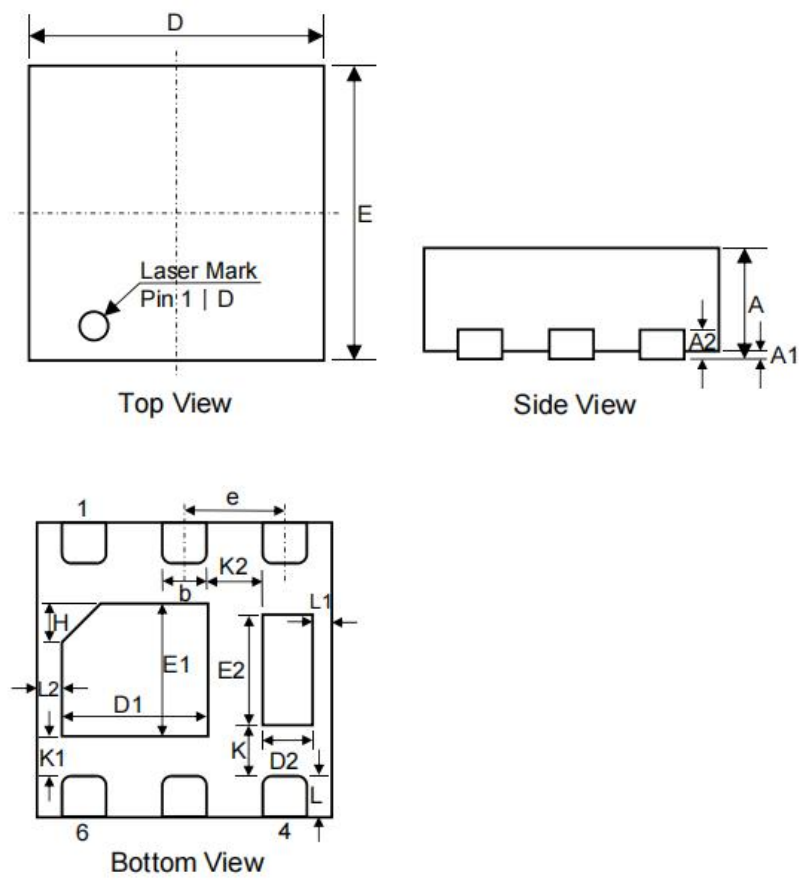
Marking Instructions



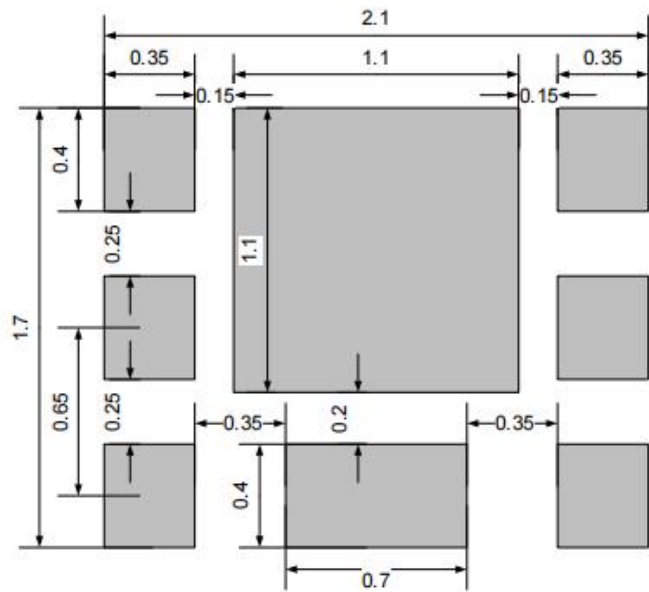
Packaging SPEC

Device	Package	MSL	Reel	Shipping
CT045N03ZF	DFN2020-6L	3	7"	3000 / Tape & Reel

Package Outline Dimensions



Dim	Millimeters	
	Min	Max
A	0.50	0.60
A1	0.00	0.05
A2	0.152 Ref.	
b	0.25	0.35
D	1.90	2.10
E	1.90	2.10
D1	0.80	1.00
E1	0.80	1.00
D2	0.25	0.35
E2	0.46	0.66
e	0.65 Ref.	
H	0.30 Ref.	
K	0.42 Ref.	
K1	0.25 Ref.	
K2	0.35 Ref.	
L	0.25	0.35
L1	0.20 Ref.	
L2	0.25 Ref.	



Unit: mm

Suggested PCB Layout