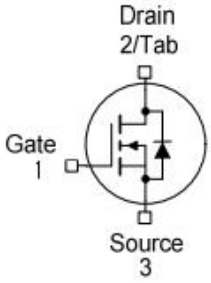
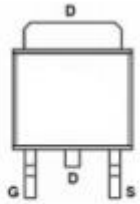
GD50N06C
N-Channel MOSFET
60V, 50A, $R_{DS(ON)}$<22mΩ



General Description and Features

- Super high density cell design for extremely low $R_{DS(ON)}$
- Exceptional on-resistance and maximum DC current capability
- Excellent switching characteristics
- Low gate charge
- Extended safe operating area
- Lower $R_{DS(ON)}$: 17mΩ (Typical) @ VGS = 10V
- 100% avalanche tested
- Improved dv/dt capability
- RoHS compliant
- JEDEC qualification

TO-252



Pin assignment

ABSOLUTE MAXIMUM RATINGS (Ta=25 ℃)

Symbol	Parameter		Value	Unit
BV_{DSS}	Drain-Source Voltage		60	V
BV_{GSS}	Gate-Source Voltage		±20	V
I_D	Drain Current continuous Tc=25℃		50	A
I_{DM}	Drain Current - pulse		200	A
P_D	Power Dissipation	Tc=25℃	80	W
		Derated above 25℃	0.8	W/℃
T_J, T_{STG}	Operating and Storage Temperature Range		-55～+150	℃
T_L	Maximum Lead Temperature for Soldering		260	℃

Thermal Characteristics

Symbol	Parameter	TO-252	Unit
$R_{\theta JC}$	Thermal Resistance ,Junction to Case	2.12	℃/W
$R_{\theta JA}$	Thermal Resistance ,Junction to Ambient	100	℃/W

Electrical Characteristics(Tc=25℃ unless otherwise specified)

Symbol	Parameter	Test conditions	min	typ	max	unit
Off state characteristics						
BV_{DSS}	Drain to Source breakdown Voltage	I_D=250μA,V_{GS}=0V	60			V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=60V,V_{GS}=0V			1	μA

I_{GSS}	Gate to Source Leakage Current	V_{GS}=±20V,V_{DS}=0V			±100	nA
On state characteristics						
$V_{GS(th)}$	Gate to Source Threshold Voltage	I_D=250μA,V_{GS}=V_{DS}	2		4	V
$R_{DS(on)}$	Drain to Source On-Resistance	I_D=50A,V_{GS}=10V		17	22	mΩ
Dynamic characteristics						
C_{ISS}	Input Capacitance	V_{DS}=15V,V_{GS}=0V,f=1MHz		2270		pF
C_{OSS}	Output Capacitance			197		pF
C_{RSS}	Reverse Transfer Capacitance			62		pF
Switching characteristics						
$t_{d(on)}$	Turn-On Delay Time	V_{DD}=30V,R_L=30Ω V_{GS}=10V,R_G=3.6Ω (Note1,2)		29		ns
t_r	Rise Time			5		ns
$t_{d(off)}$	Turn-Off Delay Time			53		ns
t_f	Fall Time			6		ns
Q_g	Total Gate Charge	V_{DD}=48V,I_D=50A V_{GS}=4.5V (Note1,2)		38		nC
Q_{gs}	Gate to Emitter Charge			15		nC
Q_{gd}	Gate to Collector Charge			8		nC
Source Drain Diode Characteristics						
Symbol	**Parameter**	**Test conditions**	**min**	**typ**	**max**	**unit**
I_S	Maximum Continuous Drain-Source Diode Forward Current				50	A
I_{SM}	Maximum Pulsed Drain-Source Diode Forward Current				200	A
V_{SD}	Drain to Source Diode Forward Voltage	I_S=50A,V_{GS}=0V		1.0	1.2	V
t_{rr}	Diode Reverse Recovery Time	I_S=50A,V_{GS}=0V di/dt=100A/μS		54		nS
Q_{rr}	Diode Reverse Recovery Charge			81		nC

Note:
1.Pulse Test :Pulse Width≤300μs，Duty cycle≤2%
2.Essentially Independent of operating Temperature Typical Characteristics

Ratings and Characteristic Curves

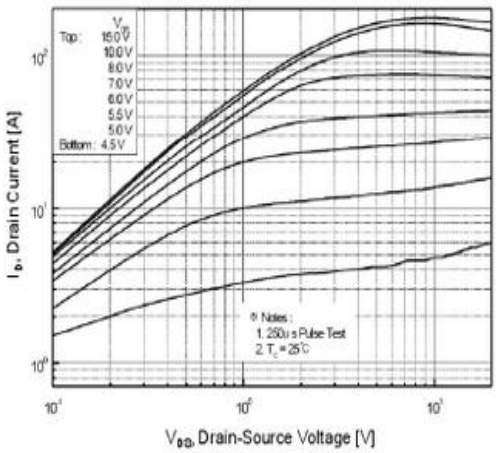


Fig.1 Output Characteristics

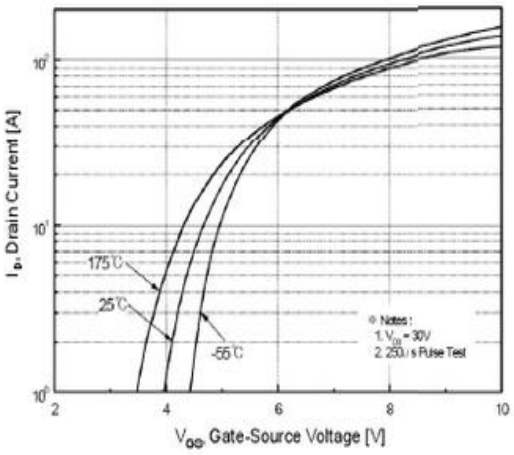


Fig.2 Transfer Characteristics

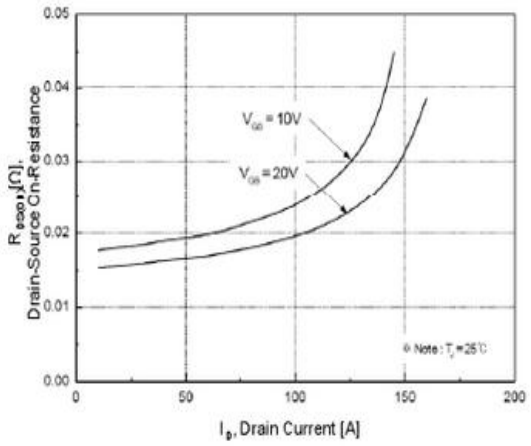


Fig.3 On-Resistance Variation vs. Drain Current and Gate Voltage

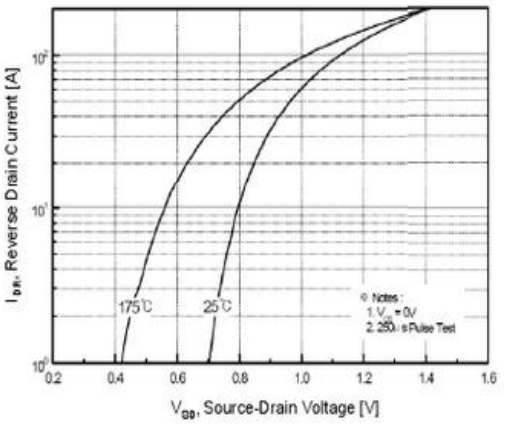


Fig.4 Body Diode Forward Voltage vs. Source Current and Temperature

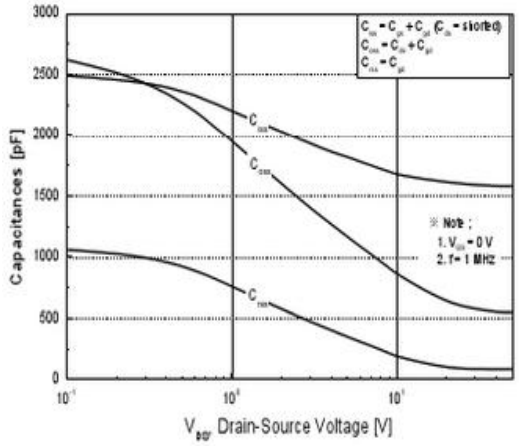


Fig.5 Capacitance Characteristics

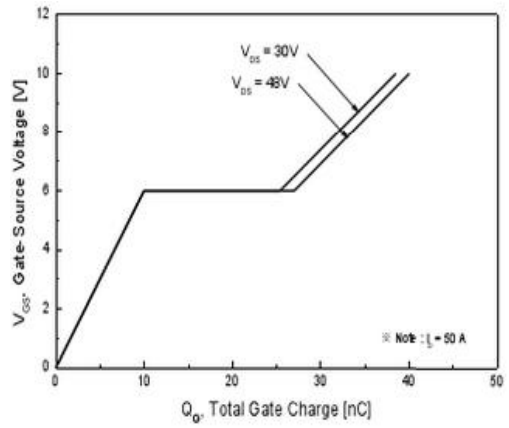


Fig.6 Gate Charge Characteristics

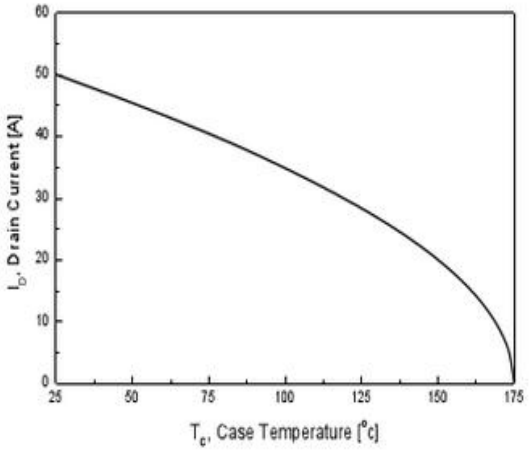


Fig.7 Maximum Drain Current vs. Case Temperature

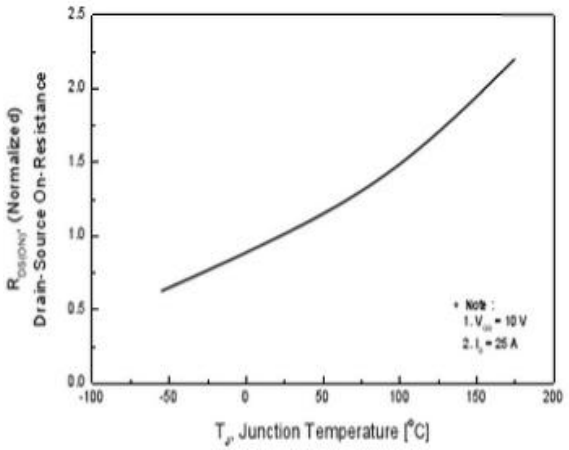


Fig.8 On-Resistance Variation Vs.Temperature

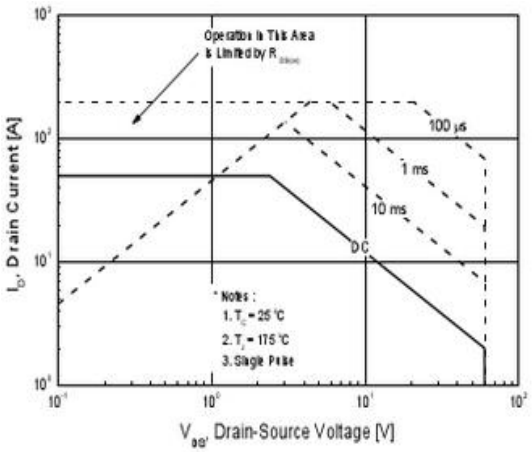


Fig.9 Maximum Safe Operating Area

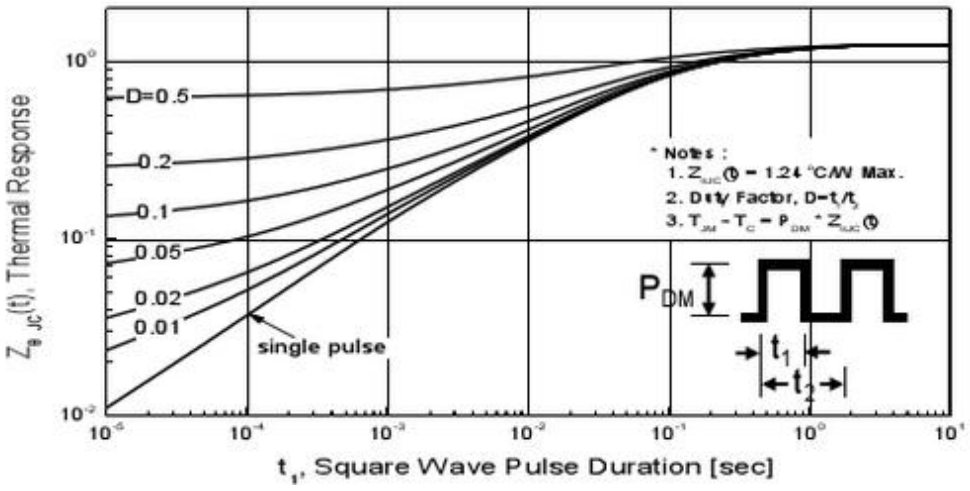
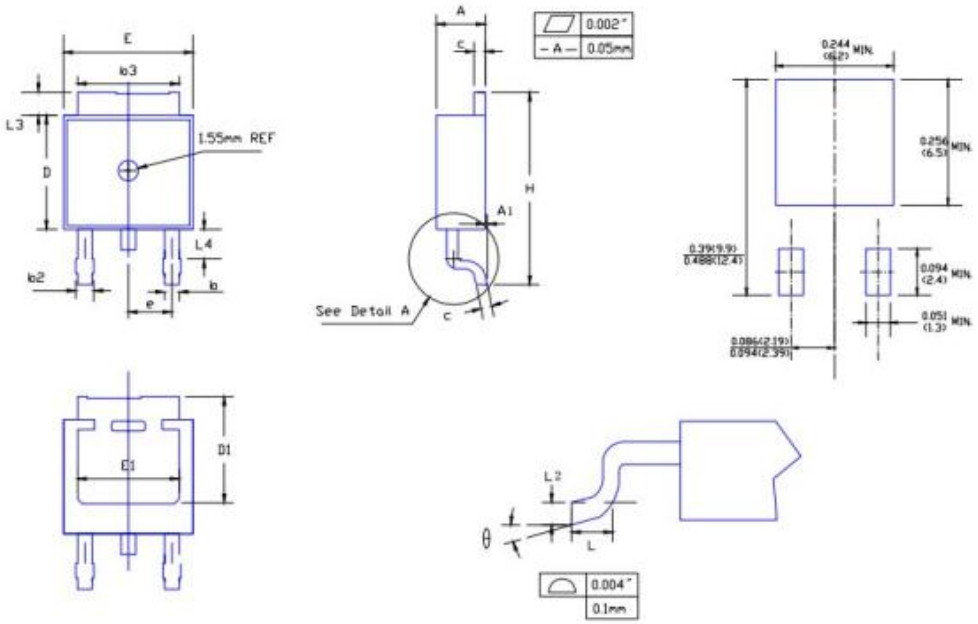


Fig.10 Transient Thermal Response Curve

TO-252 POD



SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN	MAX	MIN	MAX	
A	0.086	0.094	2.19	2.38	
A1	-	0.005	-	0.13	
b	0.025	0.035	0.64	0.89	
b2	0.033	0.045	0.84	1.14	
b3	0.205	0.215	5.21	5.46	
c	0.018	0.024	0.46	0.61	
D	0.235	0.250	5.97	6.22	
D1	0.205	-	5.21	-	
E	0.250	0.265	6.35	6.73	
E1	0.190	-	4.83	-	
e	0.090 BSC.		2.29 BSC.		
H	0.380	0.410	9.65	10.41	
L	0.055	0.070	1.40	1.78	
L2	0.020 BSC.		0.51 BSC.		
L3	0.035	0.050	0.89	1.27	
L4	0.025	0.040	0.64	1.01	
θ	0°	8°	0°	8°	