

## Features

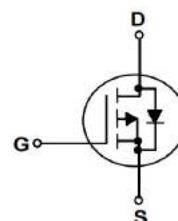
- P-Channel
- High Power and current handing capability
- Lead free product is acquired
- 100% EAS Tested

$V_{DS}$	-30	V
$R_{DS(on),TYP@V_{GS}=-10V}$	2.8	m $\Omega$
$R_{DS(on),TYP@V_{GS}=-4.5V}$	4.6	m $\Omega$
$I_D$	-105	A

DNF5x6



Part ID	Package Type	Marking	Packing
ZT028P03G	DNF5x6	ZT028P03G	5000pcs/reel



## Absolute Maximum Ratings $T_A=25^{\circ}\text{C}$ , unless otherwise specified

Symbol	Parameter	Rating	Unit
<b>Common Ratings (<math>T_c=25^{\circ}\text{C}</math> Unless Otherwise Noted)</b>			
$V_{GS}$	Gate-Source Voltage	$\pm 20$	V
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	-30	V
$T_J$	Maximum Junction Temperature	150	$^{\circ}\text{C}$
$T_{STG}$	Storage Temperature Range	-55 to 150	$^{\circ}\text{C}$
$I_{DM}$	Drain Current-Continuous@ Current-Pulsed (Note 1)	$T_C=25^{\circ}\text{C}$ -416	A
<b>Mounted on Large Heat Sink</b>			
$I_D$	Drain Current-Continuous	$T_C=25^{\circ}\text{C}$	-105
		$T_C=100^{\circ}\text{C}$	-65
$P_D$	Maximum Power Dissipation	$T_C=25^{\circ}\text{C}$	58
		$T_C=100^{\circ}\text{C}$	23
$R_{JC}$	Thermal Resistance-Junction to Case	2.15	$^{\circ}\text{C/W}$
<b>Drain-Source Avalanche Ratings</b>			
EAS	Avalanche Energy, Single Pulsed (Note 2)	578	mJ

**Electrical Characteristics  $T_J=25$  unless otherwise noted**

Symbol	Parameter	Condition	Min	Typ	Max	Unit
Static Electrical Characteristics @ T <sub>J</sub> =25°C (unless otherwise stated)						
V(BR)DSS	Drain-Source Breakdown Voltage	V <sub>GS</sub> =0V, I <sub>D</sub> =-250μA	-30	--	--	V
IDSS	Zero Gate Voltage Drain Current	V <sub>DS</sub> =-30V, V <sub>GS</sub> =0V	--	--	-1	μA
IGSS	Gate-Body Leakage Current	V <sub>GS</sub> =±20V, V <sub>DS</sub> =0V	--	--	±100	nA
VGS(th)	Gate Threshold Voltage	V <sub>DS</sub> =V <sub>GS</sub> , I <sub>D</sub> =-250μA	-1.0	-1.7	-2.5	V
RDS(on)	Drain-Source On-State Resistance (Note 4)	V <sub>GS</sub> =-10V, I <sub>D</sub> =-20A	--	2.8	3.5	mΩ
RDS(on)	Drain-Source On-State Resistance	V <sub>GS</sub> =-4.5V, I <sub>D</sub> =-20A	--	4.6	5.9	mΩ
gFS	Forward Transconductance (Note 4)	V <sub>DS</sub> =-5V, I <sub>D</sub> =-20A	--	65	--	S
Dynamic Electrical Characteristics @ T <sub>J</sub> = 25°C (unless otherwise stated)						
Ciss	Input Capacitance	V <sub>DS</sub> =-15V, V <sub>GS</sub> =0V, f=1MHz	--	6995	--	pF
Coss	OutputCapacitance		--	820	--	pF
Crss	ReverseTransferCapacitance		--	540	--	pF
Rg	Gate Resistance	f=1MHz	--	2.2	--	Ω
Qg	Total Gate Charge	V <sub>DS</sub> =-15V, I <sub>D</sub> =-20A, V <sub>GS</sub> =-10V	--	130	--	nC
Qgs	Gate-SourceCharge		--	12	--	nC
Qgd	Gate-DrainCharge		--	31	--	nC
Switching Characteristics (Note 5)						
Td(on)	Turn-on Delay Time	V <sub>DD</sub> =-15V, R <sub>L</sub> =0.75Ω, R <sub>G</sub> =3Ω, V <sub>GS</sub> =-10V	--	14	--	ns
Tr	Turn-on Rise Time		--	13	--	ns
Td(off)	Turn-Off Delay Time		--	65	--	ns
Tf	Turn-Off Fall Time		--	37	--	ns
Source- Drain Diode Characteristics@ T <sub>J</sub> = 25°C (unless otherwise stated)						
ISD	Source-Drain Current (Body Diode)		--	--	-105	A
VSD	Forward on voltage	I <sub>S</sub> =-20A, V <sub>GS</sub> =0V	--	--	-1.2	V
Trr	Reverse Recovery Time	T <sub>J</sub> =25 ,I <sub>F</sub> =-20A, V <sub>GS</sub> =0V	--	30	--	ns
Qrr	Reverse Recovery Charge	di/dt=100A/μs	--	40	--	nC

Note :

- 1.Repetitive Rating: Pulse width limited by maximum junction temperature.
- 2.EAS condition:  $T_J=25^{\circ}\text{C}, V_{DD}=15V, V_G=-10V, R_g=25\Omega, L=0.5\text{mH}$ .
- 3.Repetitive Rating: Pulse width limited by maximum junction temperature.

## Typical Electrical And Thermal Characteristics (Curves)

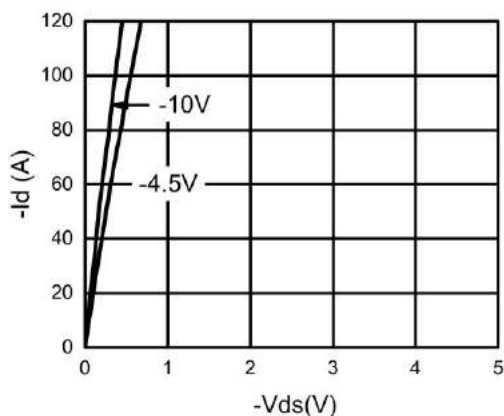


Figure 1. Output Characteristics

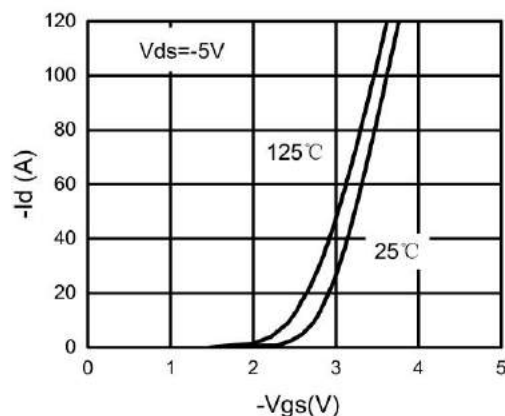


Figure 4. Transfer Characteristics

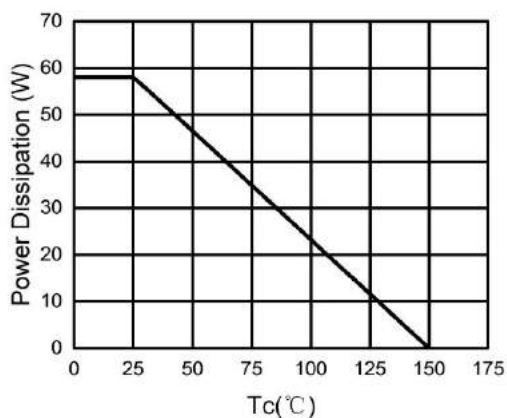


Figure 2. Power Dissipation

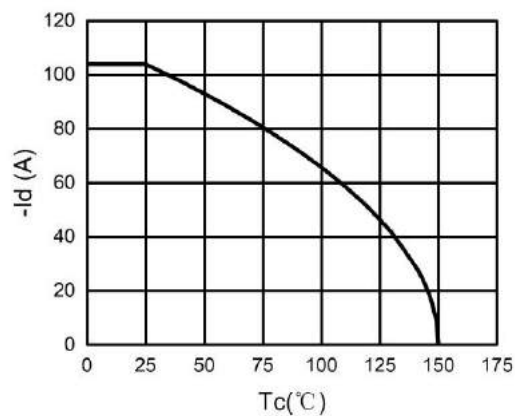


Figure 5. Drain Current

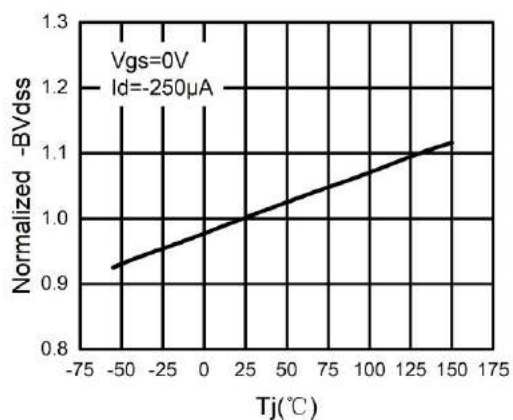


Figure 3.  $BV_{DSS}$  vs Junction Temperature

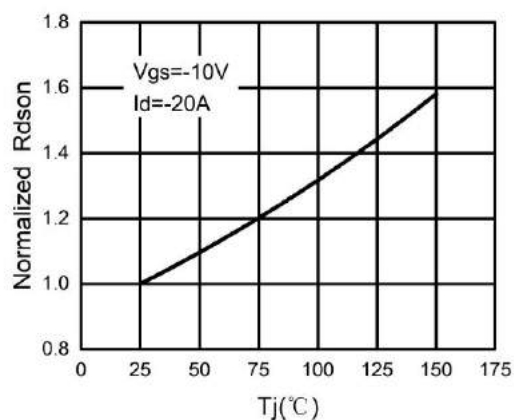
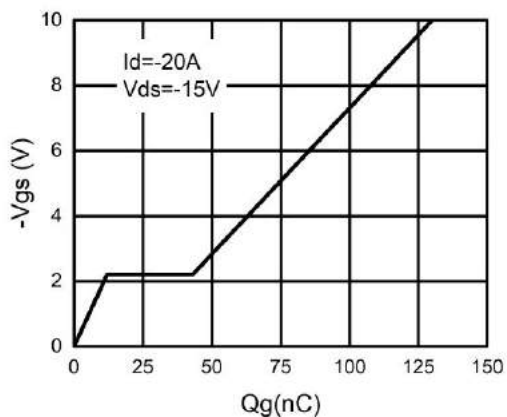
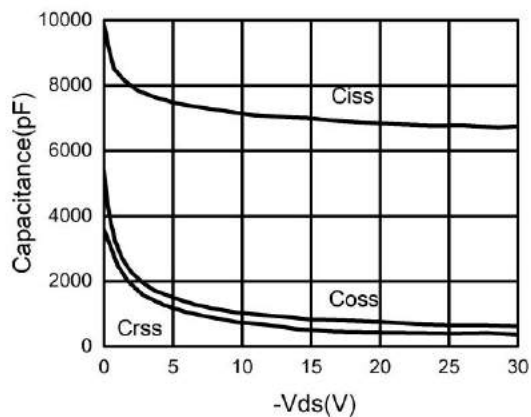


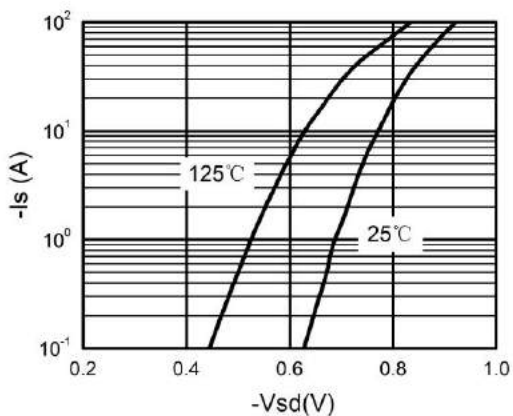
Figure 6.  $R_{DS(ON)}$  vs Junction Temperature



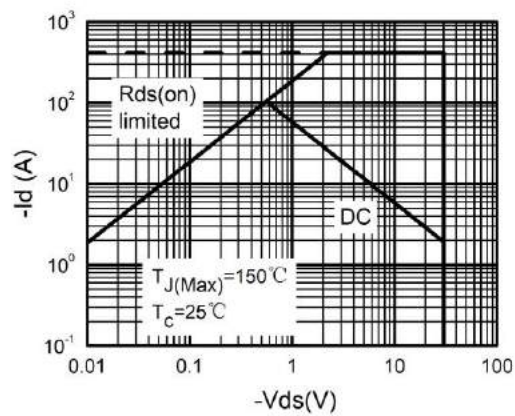
**Figure 7. Gate Charge Waveforms**



**Figure 9. Capacitance**



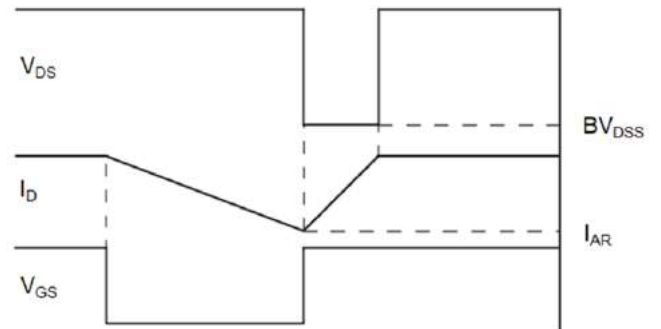
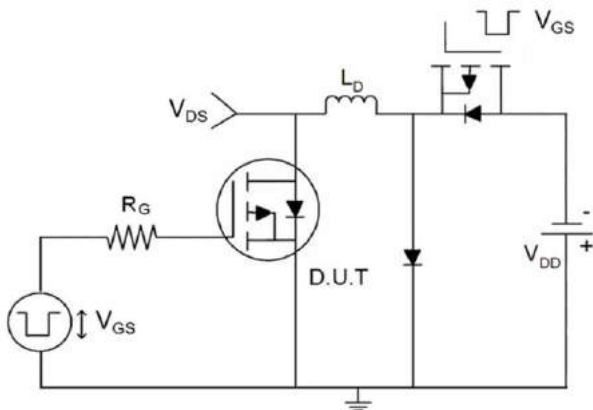
**Figure 8. Body-Diode Characteristics**



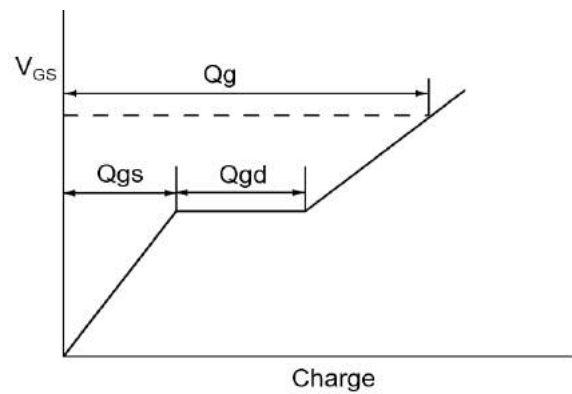
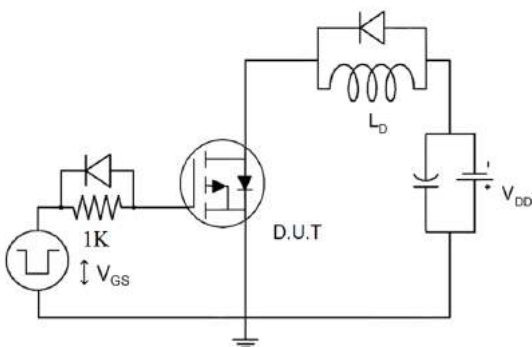
**Figure 10. Maximum Safe Operating Area**

## Test Circuit

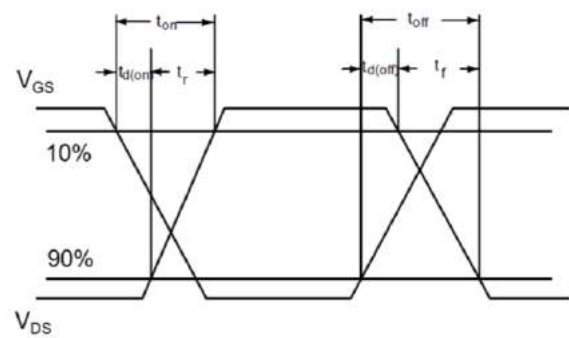
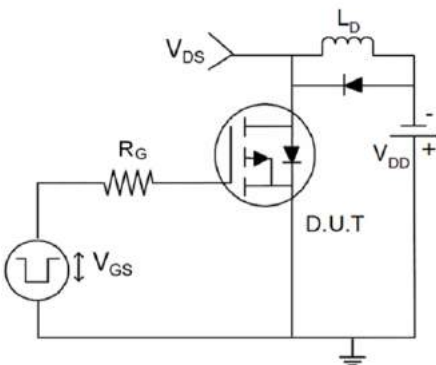
### 1) $E_{AS}$ Test Circuits



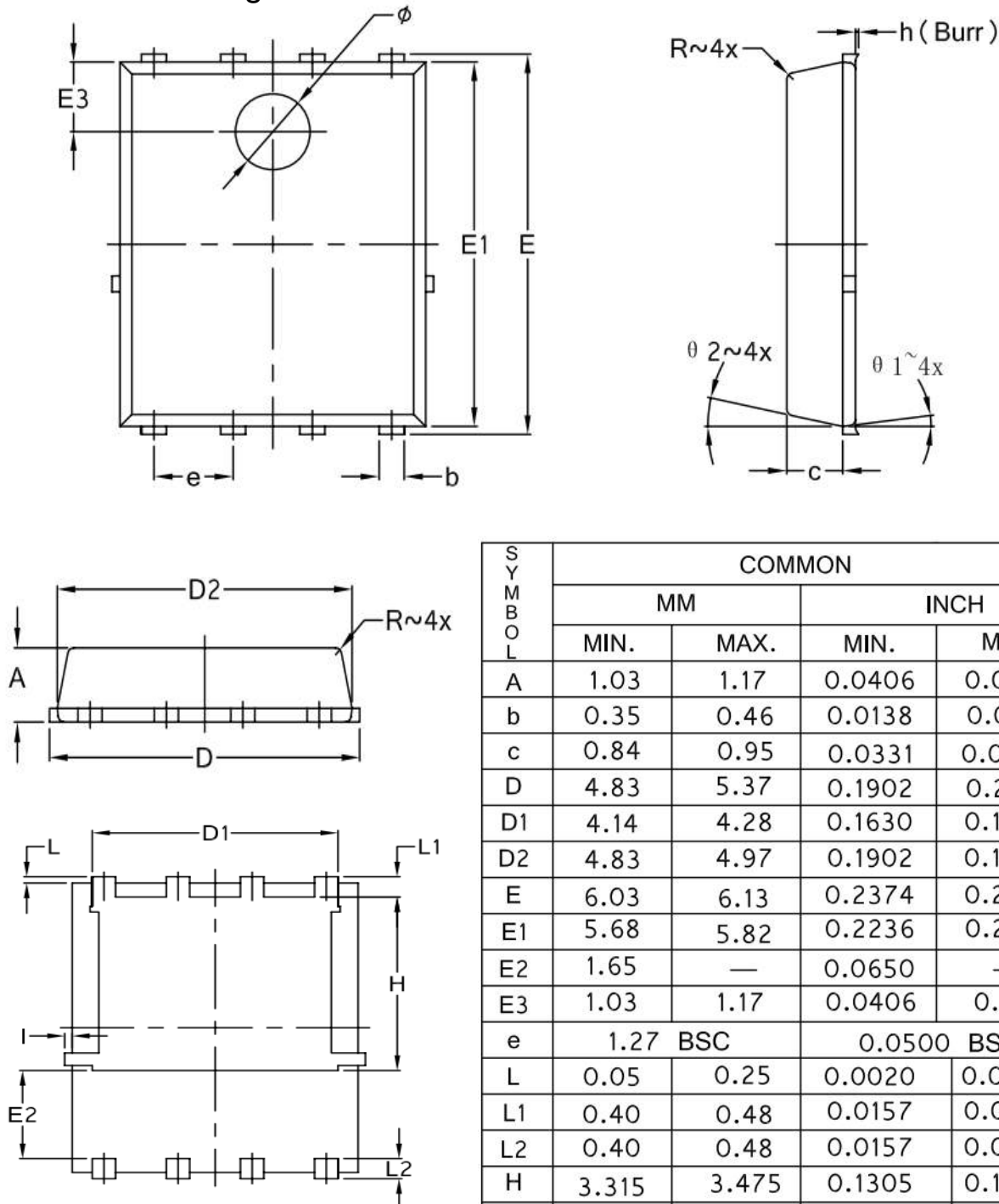
### 2) Gate Charge Test Circuit



### 3) Switch Time Test Circuit



## DFN5x6-8L Package Information



S Y M B O L	COMMON			
	MM		INCH	
	MIN.	MAX.	MIN.	MAX.
A	1.03	1.17	0.0406	0.0461
b	0.35	0.46	0.0138	0.0181
c	0.84	0.95	0.0331	0.0374
D	4.83	5.37	0.1902	0.2114
D1	4.14	4.28	0.1630	0.1685
D2	4.83	4.97	0.1902	0.1957
E	6.03	6.13	0.2374	0.2413
E1	5.68	5.82	0.2236	0.2291
E2	1.65	—	0.0650	—
E3	1.03	1.17	0.0406	0.0461
e	1.27 BSC		0.0500 BSC	
L	0.05	0.25	0.0020	0.0098
L1	0.40	0.48	0.0157	0.0189
L2	0.40	0.48	0.0157	0.0189
H	3.315	3.475	0.1305	0.1368
I	—	0.16	—	0.0063
$\phi$	1.13	1.27	0.0445	0.0500
R	0.10		0.0039	
$\theta 1$	7° REF		7° REF	
$\theta 2$	12° REF		12° REF	
h	0.08 MAX		0.0031	

## Customer Service

Sales and Service:

[zj@ztasemi.com](mailto:zj@ztasemi.com)