ZK40P80T

P-channel Enhancement Mode Power MOSFET

Features

- Advanced Trench Technology
- Excellent $R_{DS(ON)}$ and Low Gate Charge
- Lead free product is acquired
- 100% UIS TESTED!
- 100% ΔVds TESTED!

Product Summary

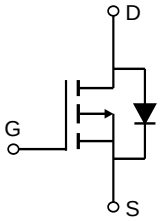
Parameters	Value	Unit
V_{DSS}	-40	V
$V_{GS(th)\_Typ}$	-1.7	V
I_D(@V_{GS}=-10V)	-80	A
$R_{DS(ON)\_Typ}$ @V_{GS}=-10V	7.5	mΩ
$R_{DS(ON)\_Typ}$ @V_{GS}=-4.5V	10	mΩ

Applications

- Load Switch
- PWM Application
- Power Management

TO-252-2L Top View

Marking



Schematic Diagram

Ordering Information

Device	Marking	Package	Packing	Reel Size	Tape Width	Reel (pcs)
ZK40P80T	40P80	TO-252	Reel	N/A	N/A	2500

MAXIMUM RATINGS (T_a=25℃ unless otherwise noted)

Parameter		Symbol	Limit	Unit
Drain-Source Voltage		V_{DS}	-40	V
Gate-Source Voltage		V_{GS}	±20	V
Continuous Drain Current	T_C = 25°C	I_D	-80	A
	T_C = 100°C		-56	
Pulsed Drain Current		I_{DM}	-280	A
Single Pulsed Avalanche Energy		E_{AS}	182	mJ
Power Dissipation		P_D	90	W
Thermal Resistance, Junction to Case		$R_{\theta JC}$	1.7	℃/W
Operating Junction and Storage Temperature Range		T_J ,T_{stg}	-55 to 150	℃

MOSFET ELECTRICAL CHARACTERISTICS

T_a=25℃ unless otherwise specified

Parameter	Symbol	Test Condition	Min	Typ	Max	Unit
Off characteristics						
Drain-source breakdown voltage	$V_{(BR)\ DSS}$	V_{GS} = 0V, I_D = -250uA	-40			V
Zero gate voltage drain current	I_{DSS}	V_{DS} = -32V, V_{GS} =0V			-1.0	μA
Gate-body leakage current	I_{GSS}	V_{DS} = 0V, V_{GS} =±20V			±100	nA
On characteristics						
Gate-threshold voltage	$V_{GS(th)}$	V_{DS} =V_{GS}, I_D =-250uA	-1.0	-1.7	-2.5	V
Static drain-source on-sate resistance	$R_{DS(on)}$	V_{GS} =-10V, I_D =-30A		7.5	9.2	mΩ
		V_{GS} =-4.5V, I_D =-30A		10.0	13	mΩ
Dynamic characteristics						
Input capacitance	C_{iss}	V_{DS} =-15V,V_{GS} =0V f =1MHz		6650		pF
Output capacitance	C_{oss}			530		
Reverse transfer capacitance	C_{rss}			287		
Gate resistance	R_g	f =1MHz		4.2		Ω
Switching characteristics						
Total gate charge	Q_g	V_{GS}=0 to -10V V_{DS}=-20V, I_D=20A		115		nC
Gate-source charge	Q_{gs}			23		
Gate-drain charge	Q_{gd}			20		
Turn-on delay time	$t_{d(on)}$	V_{DD}=-20V,I_D=-20A V_{GS}=-10V,R_{GEN}=3Ω		15		ns
Turn-on rise time	t_r			88		
Turn-off delay time	$t_{d(off)}$			122		
Turn-off fall time	t_f			101		
Drain-Source Diode Characteristics						
Drain-source diode forward voltage	V_{SD}	V_{GS} =0V, I_S=-30A			-1.2	V
Continuous drain-source diode forward current	I_S				-70	A
Pulsed drain-source diode forward current	I_{SM}				-280	A
Reverse recovery time	trr	di/dt = 100A/μs, I_S = -20A		25		ns
Reverse recovery charge	Qrr			17		nC

Notes:

1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature
2. EAS condition: TJ= 25℃, VDD= -20V, VG= -10V, L= 0.5mH, RG= 25Ω, IAS= -27A
3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤2%

Typical Performance Characteristics

Figure1: Output Characteristics

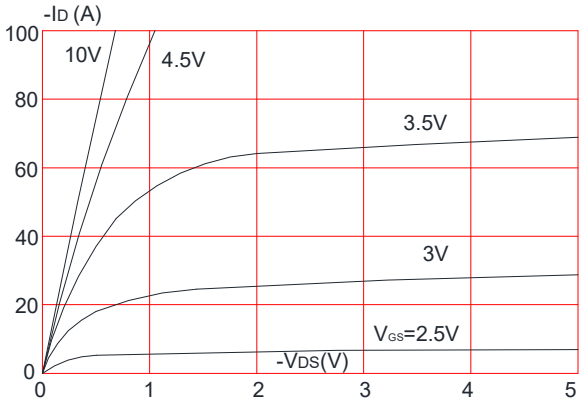


Figure 2: Typical Transfer Characteristics

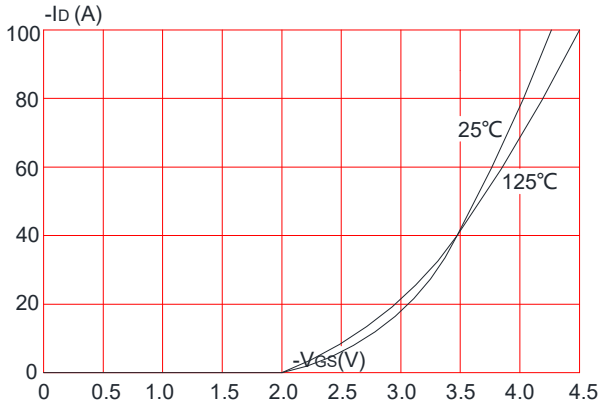


Figure 3: On-resistance vs. Drain Current

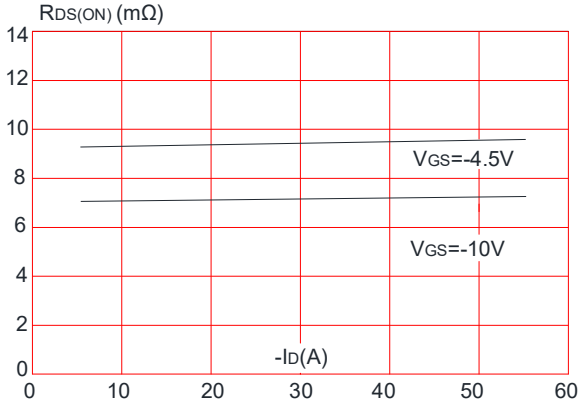


Figure 4: Body Diode Characteristics

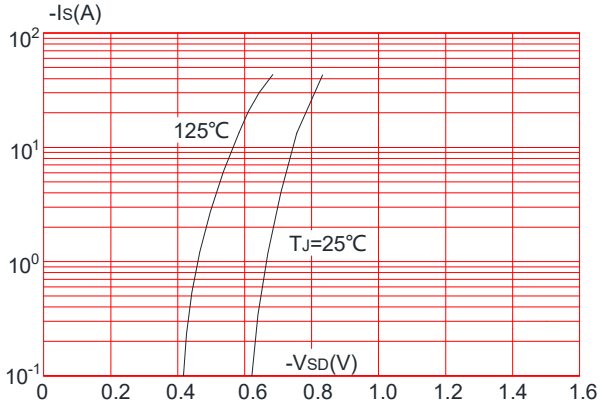


Figure 5: Gate Charge Characteristics

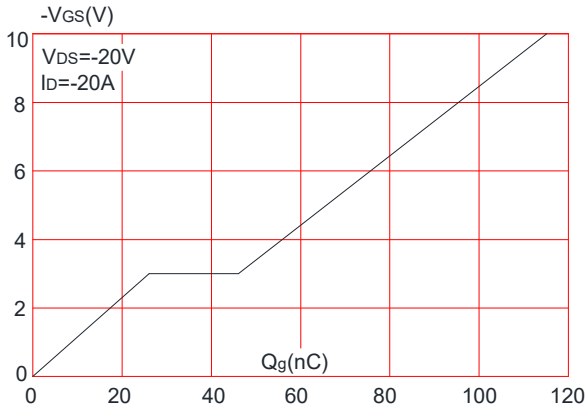
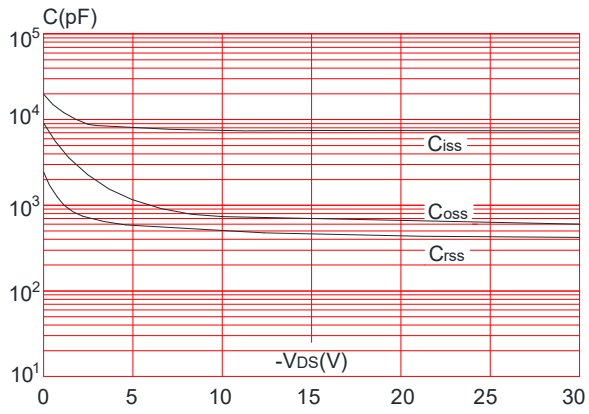


Figure 6: Capacitance Characteristics



Typical Performance Characteristics

Figure 7: Normalized Breakdown Voltage vs. Junction Temperature

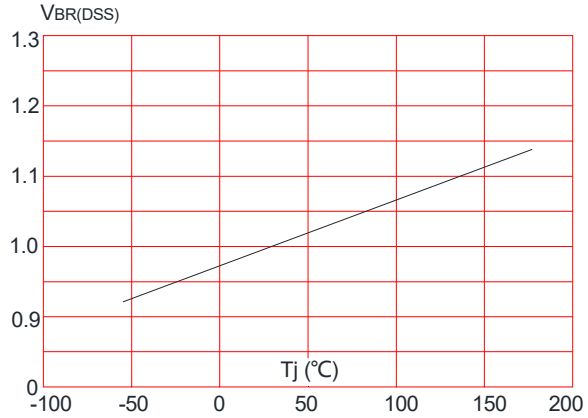


Figure 8: Normalized on Resistance vs. Junction Temperature

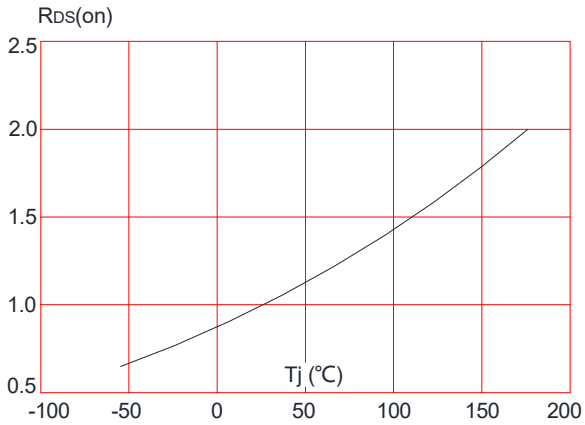


Figure 9: Maximum Safe Operating Area

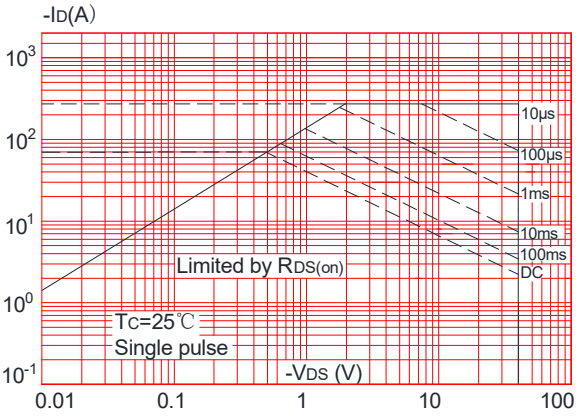


Figure 10: Maximum Continuous Drain Current vs. Case Temperature

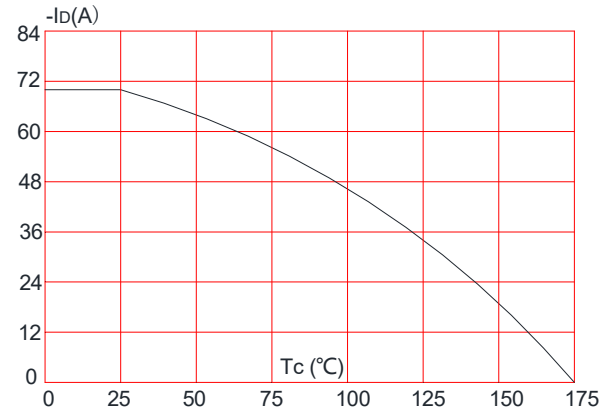
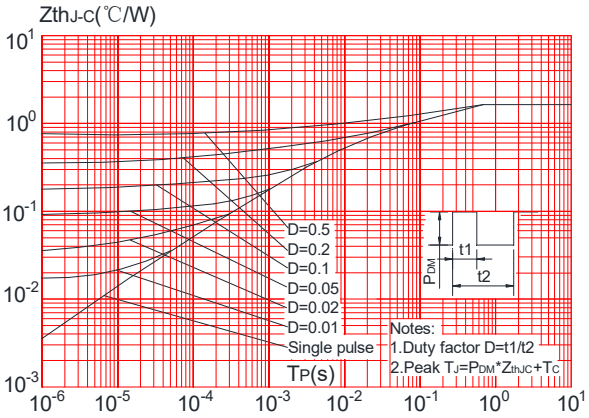
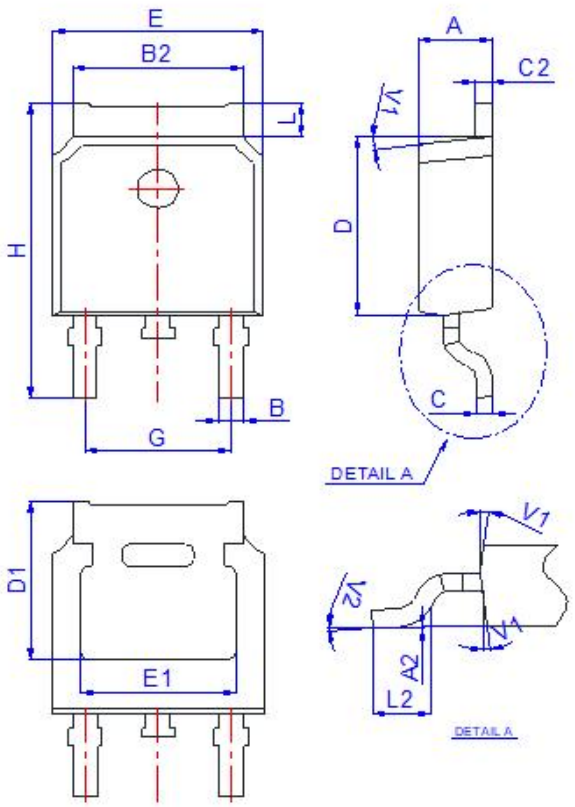


Figure.11: Maximum Effective Transient Thermal Impedance, Junction-to-Case



Package Mechanical Data(TO-252-2L)



Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.10		2.50	0.083		0.098
A2	0		0.10	0		0.004
B	0.66		0.86	0.026		0.034
B2	5.18		5.48	0.202		0.216
C	0.40		0.60	0.016		0.024
C2	0.44		0.58	0.017		0.023
D	5.90		6.30	0.232		0.248
D1	5.30REF			0.209REF		
E	6.40		6.80	0.252		0.268
E1	4.63			0.182		
G	4.47		4.67	0.176		0.184
H	9.50		10.70	0.374		0.421
L	1.09		1.21	0.043		0.048
L2	1.35		1.65	0.053		0.065
V1		7°			7°	
V2	0°		6°	0°		6°