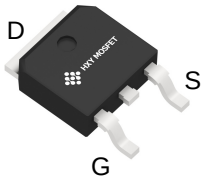
General Description

The DMTH6004SK3-13 use advanced SGT MOSFET technology to provide low RDS(ON), low gate charge, fast switching and excellent avalanche characteristics. This device is specially designed to get better ruggedness.

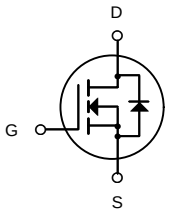


TO-252-2L

General Features

V_{DS} =60V I_D =130A

$R_{DS(ON)}$ < 3.5mΩ@ V_{GS}=10V



N-Channel MOSFET

Applications

Consumer electronic power supply Motor control

Synchronous-rectification Isolated DC

Synchronous-rectification applications

Package Marking and Ordering Information

Product ID	Pack	Brand	Qty(PCS)
DMTH6004SK3-13	TO-252-2L	HXY MOSFET	2500

Absolute Maximum Ratings (T_C=25°C unless otherwise noted)

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	60	V
V_{GS}	Gate-Source Voltage	±20	V
I_D@T_C=25°C	Continuous Drain Current, V_{GS} @ 10V	130	A
I_D@T_C=70°C	Continuous Drain Current, V_{GS} @ 10V	85	A
I_{DM}	Pulsed Drain Current[2]	390	A
EAS	Single Pulse Avalanche Energy[3]	80	mJ
P_D@T_C=25°C	Total Power Dissipation[4]	140	W
T_{STG}	Storage Temperature Range	-55 to 175	°C
T_J	Operating Junction Temperature Range	-55 to 175	°C
$R_{\theta JC}$	Thermal Resistance Junction-Ambient [1]	0.89	°C/W

Electrical Characteristics (T_J=25°C unless otherwise specified)

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Units
Off Characteristic						
$V_{(BR)DSS}$	Drain-Source Breakdown Voltage	V_{GS}=0V, I_D=250μA	60	-	-	V
I_{DSS}	Zero Gate Voltage Drain Current	V_{DS}=60V, V_{GS}=0V,	-	-	1.0	μA
I_{GSS}	Gate to Body Leakage Current	V_{DS}=0V, V_{GS}= ±20V	-	-	±100	nA
On Characteristics						
$V_{GS(th)}$	Gate Threshold Voltage	V_{DS}=V_{GS}, I_D=250μA	1.0	1.6	2.5	V
$R_{DS(on)}$	Static Drain-Source on-Resistance note3	V_{GS}=10V, I_D=20A	-	3	3.5	mΩ
		V_{GS}=4.5V, I_D=10A	-	3.5	4.5	
Dynamic Characteristics						
C_{iss}	Input Capacitance	V_{DS}=25V, V_{GS}=0V, f=1.0MHz	-	5377	-	pF
C_{oss}	Output Capacitance		-	1666	-	pF
C_{rss}	Reverse Transfer Capacitance		-	77.7	-	pF
Q_g	Total Gate Charge	V_{DS}=30V, I_D=25A, V_{GS}=10V	-	66.1	-	nC
Q_{gs}	Gate-Source Charge		-	10.7	-	nC
Q_{gd}	Gate-Drain(“Miller”) Charge		-	10.9	-	nC
Switching Characteristics						
$t_{d(on)}$	Turn-on Delay Time	V_{DD}=30V, I_D=25A, R_G=3Ω,V_{GS}=10V	-	20	-	ns
t_r	Turn-on Rise Time		-	55	-	ns
$t_{d(off)}$	Turn-off Delay Time		-	100	-	ns
t_f	Turn-off Fall Time		-	24	-	ns
Drain-Source Diode Characteristics and Maximum Ratings						
I_S	Maximum Continuous Drain to Source Diode Forward Current		-	-	125	A
I_{SM}	Maximum Pulsed Drain to Source Diode Forward Current		-	-	390	A
V_{SD}	Drain to Source Diode Forward Voltage	V_{GS}=0V, I_S=30A	-	0.8	1.3	V
t_{rr}	Body Diode Reverse Recovery Time	T_J=25°C, I_F=25A,dI/dt=100A/μs	-	68.3	-	ns
Q_{rr}	Body Diode Reverse Recovery Charge		-	73	-	nC

Notes:1. Repetitive Rating: Pulse Width Limited by Maximum Junction Temperature

2. EAS condition: T_J=25°C, V_{DD}=30V, V_G=10V, R_G=25Ω, L=0.5mH, I_{AS}=12A

3. Pulse Test: Pulse Width≤300μs, Duty Cycle≤0.5%

Typical Performance Characteristics

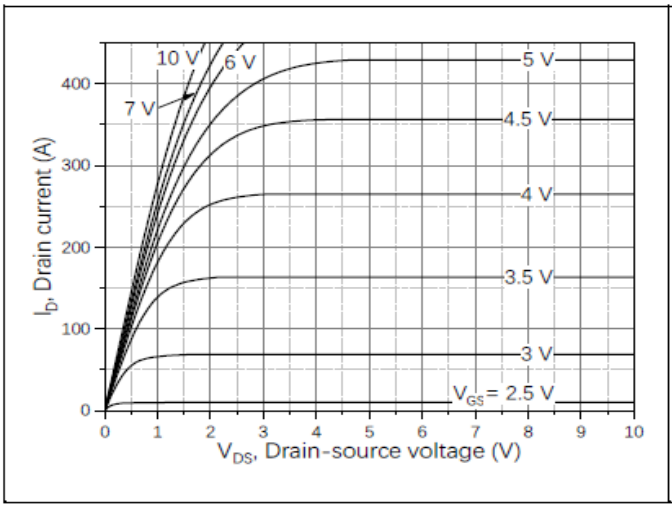


Figure 1, Typ. output characteristics

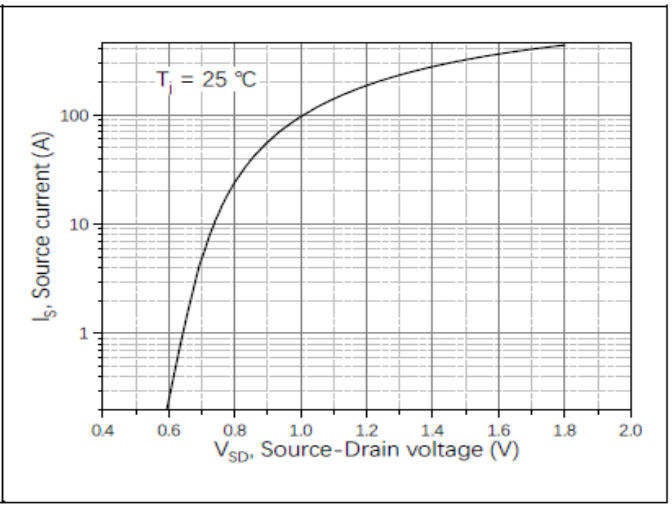


Figure 2, Typ. transfer characteristics

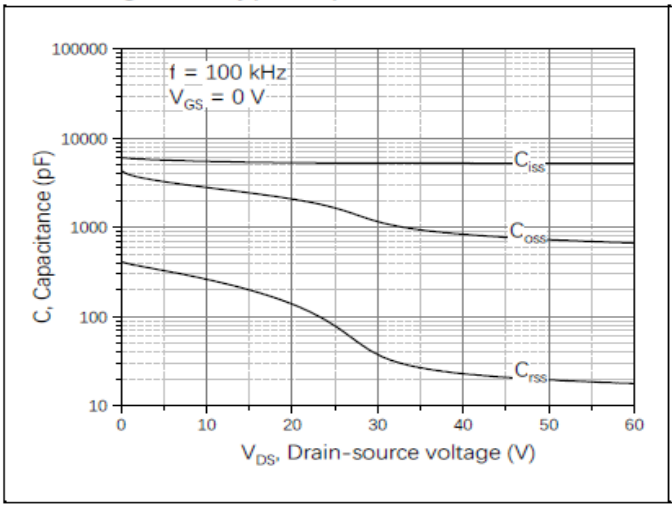


Figure 3, Typ. capacitances

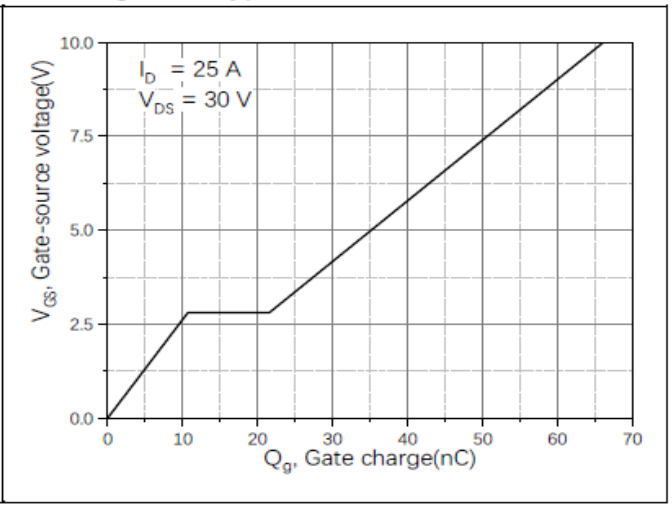


Figure 4, Typ. gate charge

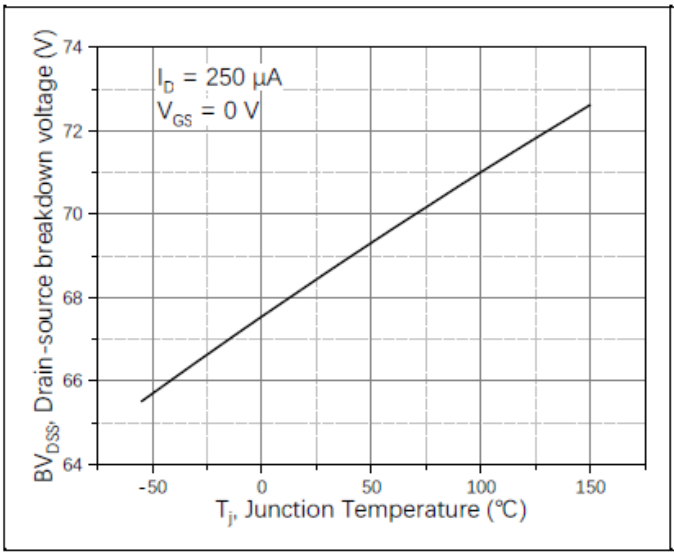


Figure 5, Drain-source breakdown voltage

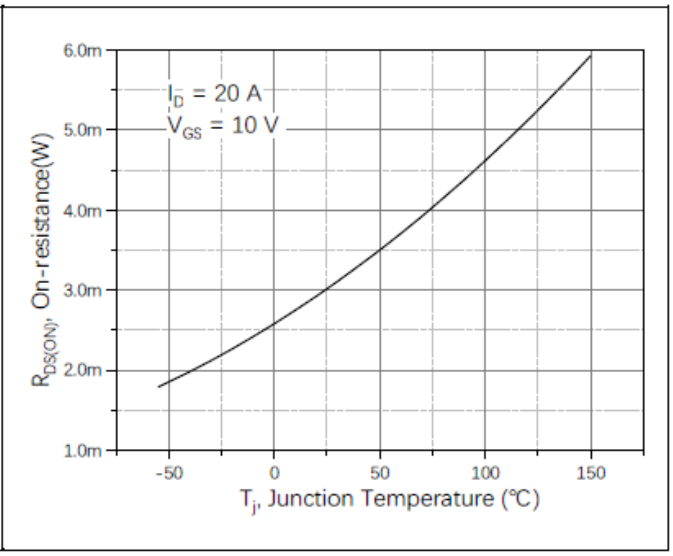


Figure 6, Drain-source on-state resistance

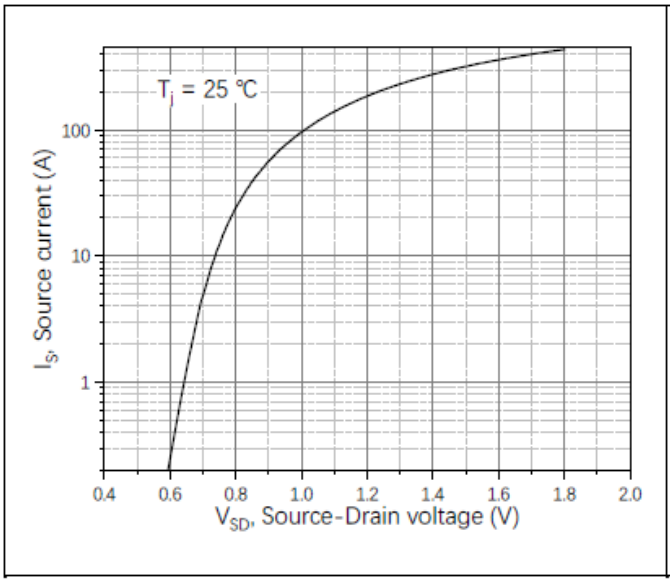


Figure 7, Forward characteristic of body diode

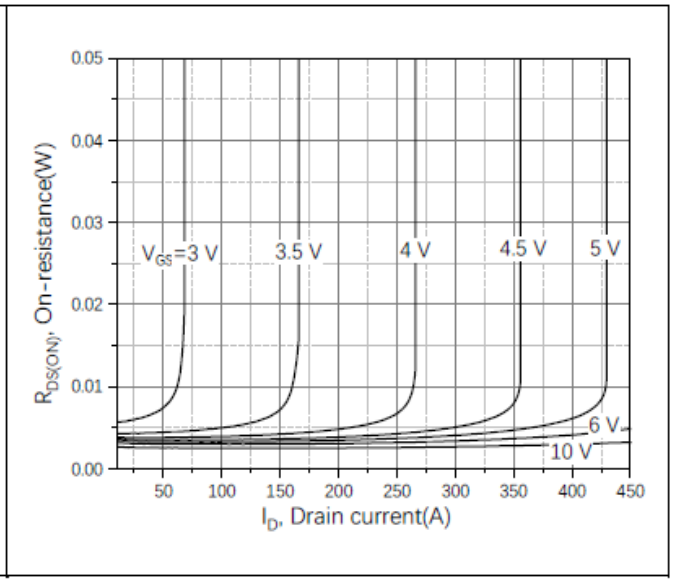


Figure 8, Drain-source on-state resistance

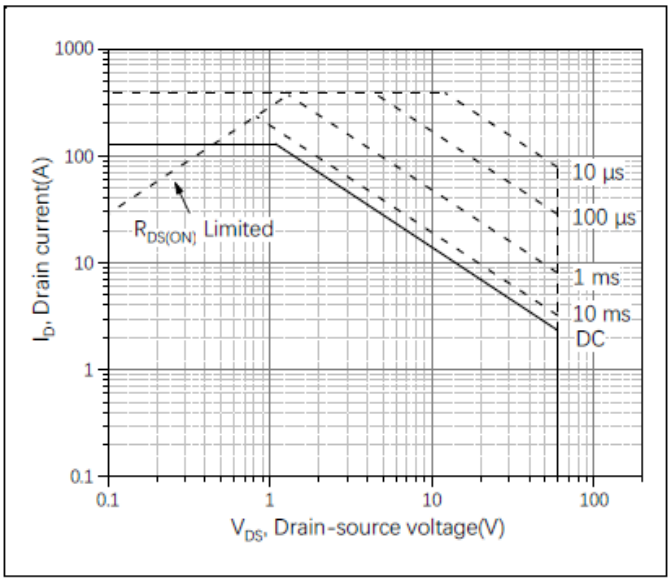
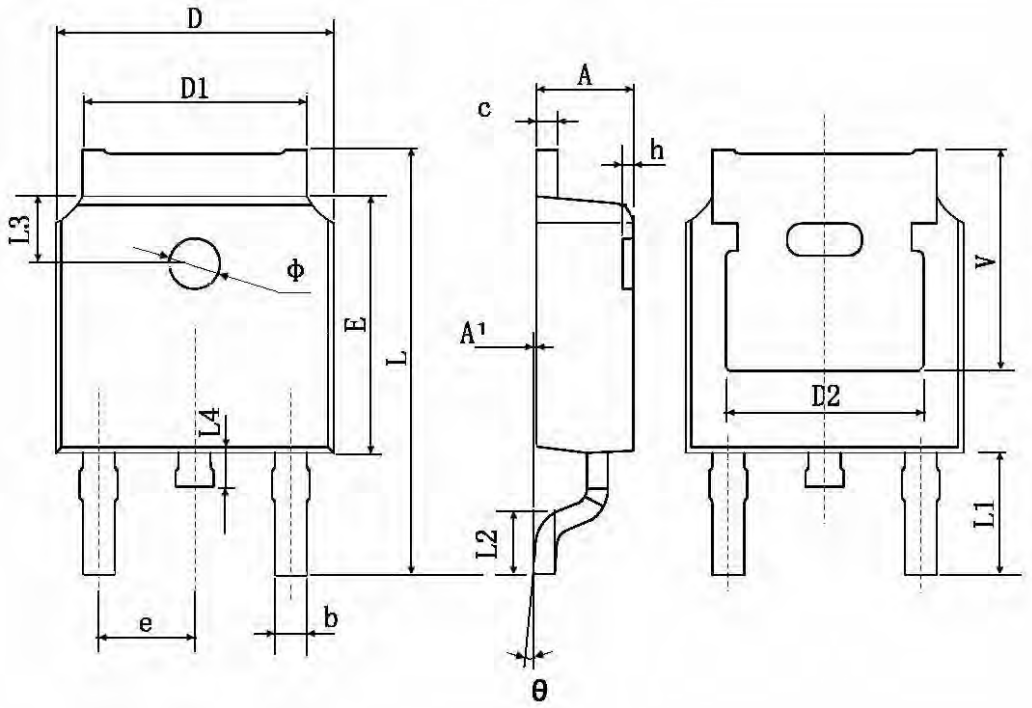


Figure 9, Safe operation area T_C=25 ℃

TO-252-2L Package Information



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	2.200	2.400	0.087	0.094
A1	0.000	0.127	0.000	0.005
b	0.660	0.860	0.026	0.034
c	0.460	0.580	0.018	0.023
D	6.500	6.700	0.256	0.264
D1	5.100	5.460	0.201	0.215
D2	0.483 TYP.		0.190 TYP.	
E	6.000	6.200	0.236	0.244
e	2.186	2.386	0.086	0.094
L	9.800	10.400	0.386	0.409
L1	2.900 TYP.		0.114 TYP.	
L2	1.400	1.700	0.055	0.067
L3	1.600 TYP.		0.063 TYP.	
L4	0.600	1.000	0.024	0.039
Φ	1.100	1.300	0.043	0.051
θ	0°	8°	0°	8°
h	0.000	0.300	0.000	0.012
V	5.350 TYP.		0.211 TYP.	

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