



N-Channel Enhancement Mode MOSFET

20V , $R_{DS(ON)}=60m\Omega(max)$, $I_D=3.2A$



RoHS
COMPLIANT

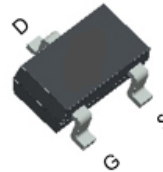
Features

- Lower Q_g and Q_{gd} for high-speed switching
- Reliable and Rugged
- ROHS Compliant & Halogen-Free

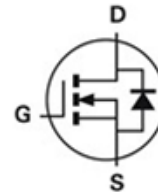
Applications

- Portable Equipment and Battery Powered systems.
- Load Switch

SOT-23



Symbol



Absolute Maximum Ratings ($T_J=25^\circ C$ Unless Otherwise Noted)

Symbol	Parameter	Rating	Unit	
V_{DSS}	Drain-Source Voltage	20	V	
V_{GSS}	Gate-Source Voltage	± 12		
T_J	Maximum Junction Temperature	150	$^\circ C$	
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ C$	
I_S	Diode Continuous Forward Current	$T_A=25^\circ C$	1.1	A
$I_{DM}^{(1)}$	Pulse Drain Current Tested	$T_A=25^\circ C$	8	A
I_D	Continuous Drain Current	$T_A=25^\circ C$	3.2	A
		$T_A=100^\circ C$	2	
P_D	Maximum Power Dissipation	$T_A=25^\circ C$	0.9	W
		$T_A=100^\circ C$	0.4	
$I_{AS}^{(2)}$	Avalanche Current, Single pulse	$L=0.1mH$	12	A
$E_{AS}^{(2)}$	Avalanche Energy, Single pulse	$L=0.1mH$	7.2	mJ

Thermal Characteristics

Symbol	Parameter	Rating	Unit	
$R_{\theta JA}^{(2)}$	Thermal Resistance-Junction to Ambient	$t \leq 10sec$	100	$^\circ C/W$
		Steady State	140	$^\circ C/W$

Note ① : Max. current is limited by junction temperature.

Note ② : Surface Mounted on 1in² FR-4 board with 1oz.



HMT04N02S

Electrical Characteristics (T _J =25°C Unless Otherwise Noted)						
Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
Static Electrical Characteristics						
BV _{DSS}	Drain-Source Breakdown Voltage	V _{GS} =0V, I _D =250μA	20	-	-	V
I _{DSS}	Zero Gate Voltage Drain Current	V _{DS} =16V, V _{GS} =0V	-	-	1	uA
V _{GS(th)}	Gate Threshold Voltage	V _{DS} =V _{GS} , I _D =250uA	0.5	0.7	1	V
I _{GSS}	Gate Leakage Current	V _{GS} =±12V, V _{DS} =0V	-	-	±100	nA
R _{DS(ON)} ③	Drain-Source On-state Resistance	V _{GS} =4.5V, I _D =3A	-	50	60	mΩ
		V _{GS} =2.5V, I _D =2A	-	66	86	
gfs	Forward Transconductance	V _{DS} =5V, I _D =3A	-	7	-	S
Dynamic Characteristics ④						
R _G	Gate Resistance	V _{GS} =0V, V _{DS} =0V, Freq.=1MHz	-	1.3	-	Ω
C _{ISS}	Input Capacitance	V _{GS} =0V, V _{DS} =10V, Freq.=1MHz	-	123	-	pF
C _{OSS}	Output Capacitance		-	30	-	
C _{RSS}	Reverse Transfer Capacitance		-	26	-	
td(ON)	Turn-on Delay Time	V _{DD} =10V, I _D =1A, V _{GS} =10V, R _{GEN} =6.8Ω	-	3.2	-	nS
t _r	Turn-on Rise Time		-	2.6	-	
t _{d(OFF)}	Turn-off Delay Time		-	10	-	
t _f	Turn-off Fall Time		-	5	-	
Q _g	Total Gate Charge	V _{DS} =10V, V _{GS} =2.5V, I _D =3A	-	1.8	-	nC
Q _g	Total Gate Charge	V _{DS} =10V, V _{GS} =4.5V, I _D =3A	-	3	-	
Q _{gs}	Gate-Source Charge		-	0.5	-	
Q _{gd}	Gate-Drain Charge		-	0.9	-	
Source-Drain Characteristics						
V _{SD} ③	Diode Forward Voltage	I _S =3A, V _{GS} =0V	-	0.8	1.1	V
Note ③ : Pulse test (pulse width≤300us, duty cycle≤2%). Note ④ : Guaranteed by design, not subject to production testing.						



Typical Characteristics

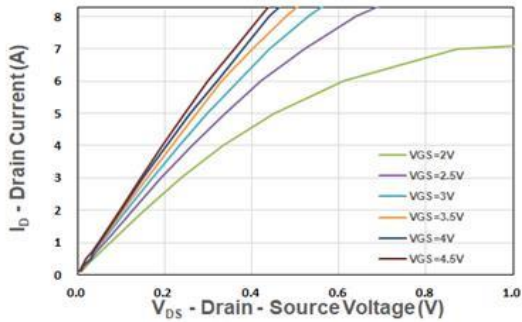


Figure 1. Output Characteristics

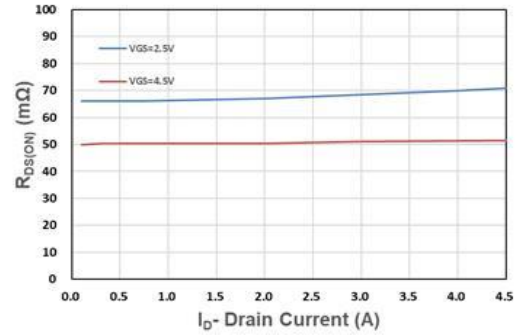


Figure 2. On-Resistance vs. I_D

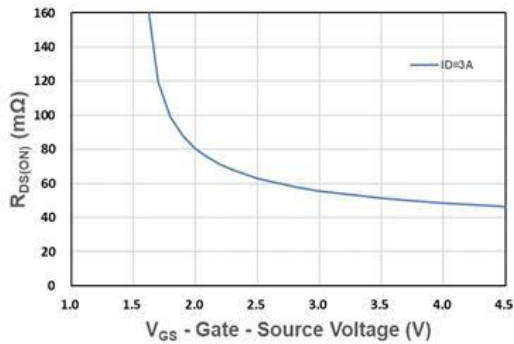


Figure 3. On-Resistance vs. V_{GS}

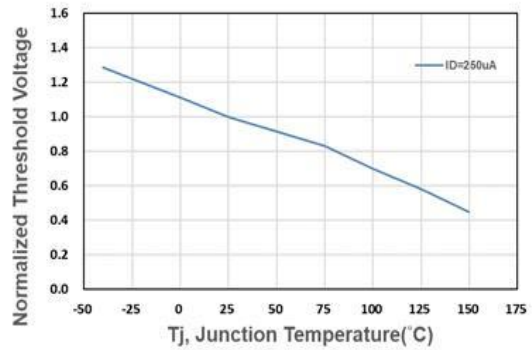


Figure 4. Gate Threshold Voltage

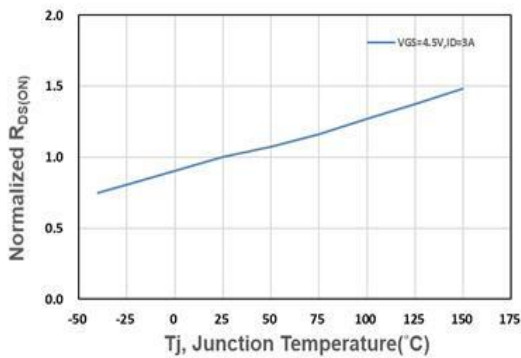


Figure 5. Drain-Source On Resistance

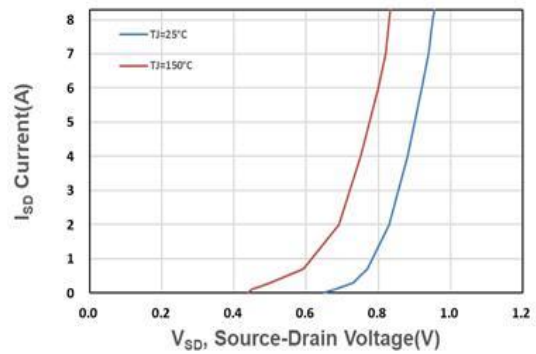


Figure 6. Source-Drain Diode Forward



Typical Characteristics

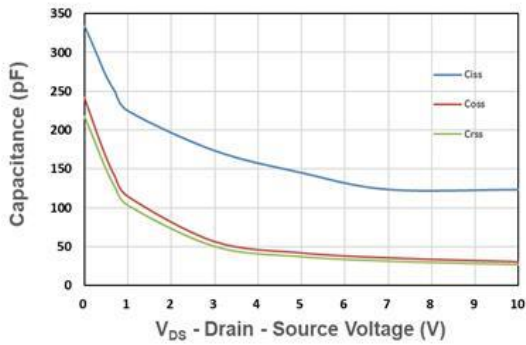


Figure 7. Capacitance

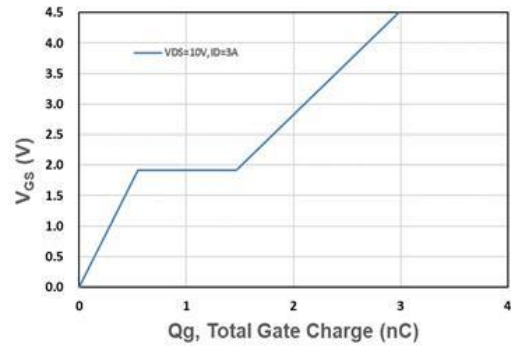


Figure 8. Gate Charge Characteristics

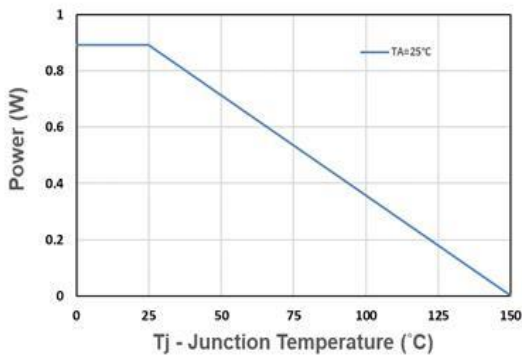


Figure 9. Power Dissipation

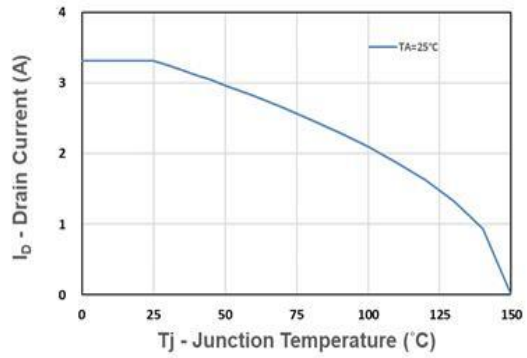


Figure 10. Drain Current

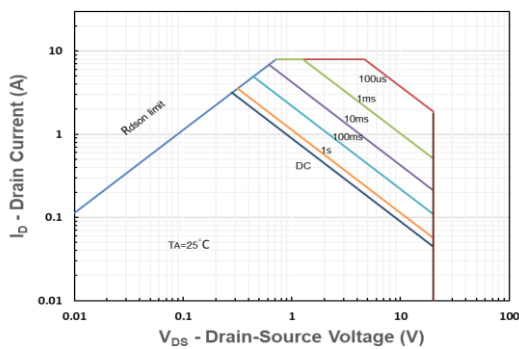


Figure 11. Safe Operating Area

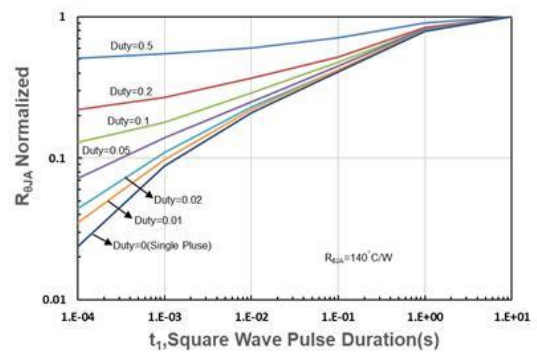


Figure 12. $R_{\theta JA}$ Transient Thermal Impedance



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