

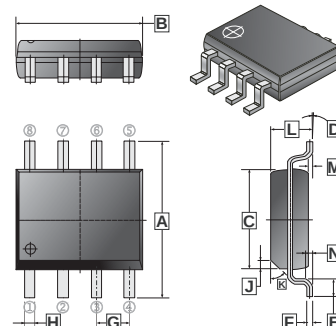
FEATURES

- Super high dense cell design for low $R_{DS(on)}$.
- Rugged and reliable.
- Surface Mount Package.

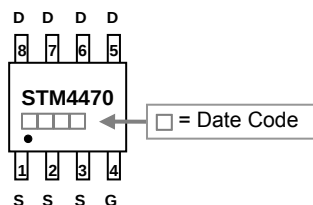
PRODUCT SUMMARY

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$V_{DSS}(V)^d$	$R_{DS(on)} m(\Omega) \text{ Max}$	$I_D(A)$
40	10@ $V_{GS}=10V$	10
	13@ $V_{GS}=4.5V$	

SOP-8



MARKING



REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	5.80	6.20	H	0.35	0.49
B	4.80	5.00	J	0.375 REF.	
C	3.80	4.00	K	45°	
D	0°	8°	L	1.35	1.75
E	0.40	0.90	M	0.10	0.25
F	0.19	0.25	N	0.25 REF.	
G	1.27 TYP.				

MAXIMUM RATINGS ($T_A = 25^\circ C$ unless otherwise specified)

PARAMETER	SYMBOL	RATINGS	UNIT
Drain-Source Voltage	V_{DS}^d	40	V
Gate-Source Voltage	V_{GS}	± 20	V
Continuous Drain Current ^a @ $T_J = 25^\circ C$	I_D	10	A
Pulsed Drain Current ^b	I_{DM}	39	A
Drain-Source Diode Forward Current ^a	I_S	1.7	A
Maximum Power Dissipation ^a	P_D	2.5	W
Operating Junction & Storage Temperature Range	T_J, T_{STG}	-55 ~ 150	$^\circ C$
THERMAL RESISTANCE RATINGS			
Thermal Resistance Junction-ambient ^a	$R_{\theta JA}$	50	$^\circ C / W$

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise specified)

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage ^d	BV _{DSS}	40	-	-	V	V _{GS} = 0V, I _D = 250μA
Zero Gate Voltage Drain Current	I _{DSS}	-	-	1	μA	V _{DS} = 32V, V _{GS} = 0V
Gate-Body Leakage Current	I _{GSS}	-	-	±100	nA	V _{GS} = ±20V, V _{DS} = 0V
ON CHARACTERISTICS ^b						
Gate Threshold Voltage	V _{GS(th)}	1	1.7	3	V	V _{DS} = V _{GS} , I _D = 250μA
Drain-Source On-State Resistance	R _{DS(ON)}	-	8	10	mΩ	V _{GS} = 10V, I _D = 10A
		-	11	13		V _{GS} = 4.5V, I _D = 6A
On-State Drain Current	I _{D(ON)}	20	-	-	A	V _{DS} = 10V, V _{GS} = 10A
Forward Transconductance	g _{fs}	-	20	-	S	V _{DS} = 10V, I _D = 10A
DYNAMIC CHARACTERISTICS ^c						
Input Capacitance	C _{ISS}	-	1020	-	pF	V _{DS} = 20V, V _{GS} = 0V, f= 1.0MHz
Output Capacitance	C _{OSS}	-	240	-		
Reverse Transfer Capacitance	C _{RSS}	-	135	-		
SWITCHING CHARACTERISTICS ^c						
Turn-On Delay Time	T _{d(on)}	-	15	-	nS	V _{DD} = 20V I _D = 1A V _{GS} = 10V R _{GEN} = 3.3Ω
Rise Time	T _r	-	22	-		
Turn-Off Delay Time	T _{d(off)}	-	48	-		
Fall Time	T _f	-	12	-		
Total Gate Charge	Q _g	-	19.5	-	nC	V _{DS} = 20V, I _D = 10A, V _{GS} = 10V
		-	9.8	-		V _{DS} = 20V, I _D = 10A, V _{GS} = 4.5V
Gate-Source Charge	Q _{gs}	-	2	-		V _{DS} = 20V, I _D = 10A, V _{GS} = 10V
Gate-Drain Charge	Q _{gd}	-	5.5	-		
DRAIN-SOURCE DIODE CHARACTERISTICS ^b						
Diode Forward Voltage	V _{SD}	-	0.73	1.2	V	V _{GS} = 0V, I _S = 1.7A

Notes

- Surface Mounted on FR4 Board, $t \leq 10$ sec.
- Pulse Test : Pulse Width $\leq 300 \mu s$, Duty Cycle $\leq 2\%$.
- Guaranteed by design, not subject to production testing.
- Guaranteed when external $R_g = 3.3\Omega$ and $t_f < t_f \text{ max.}$

CHARACTERISTIC CURVE

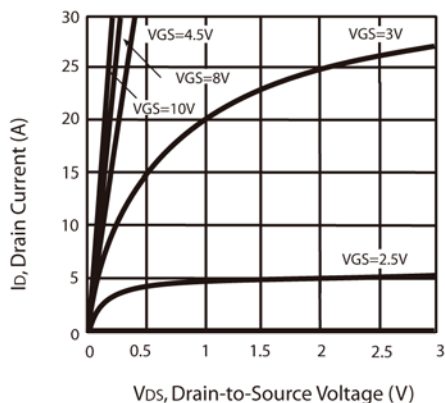


Figure 1. Output Characteristics

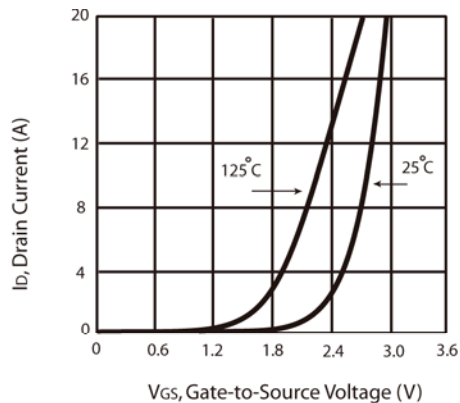


Figure 2. Transfer Characteristics

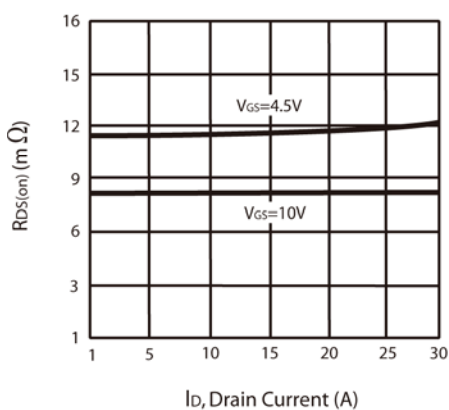


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

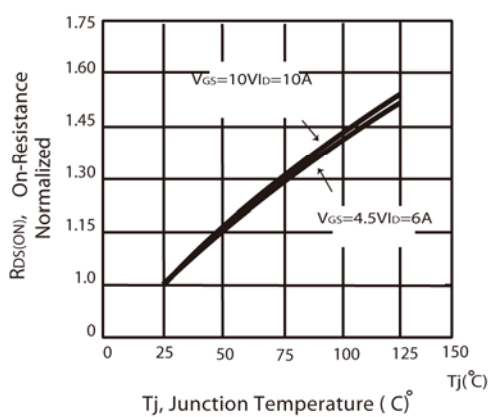
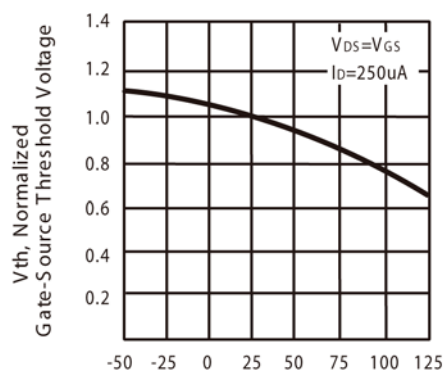


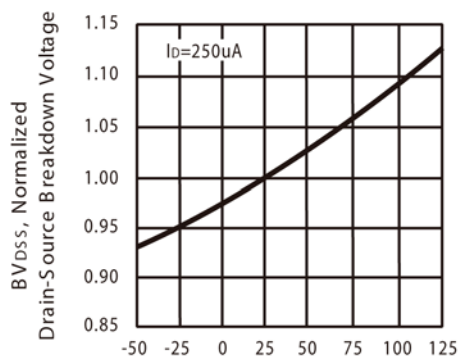
Figure 4. On-Resistance Variation with Drain Current and Temperature

CHARACTERISTIC CURVE



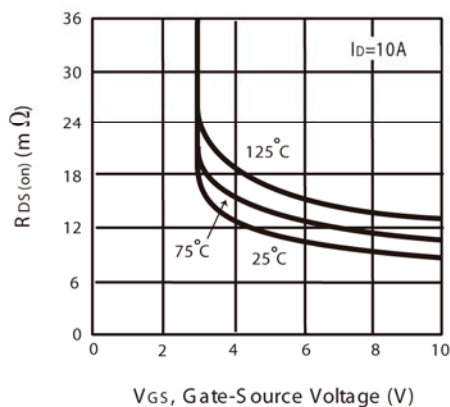
Tj, Junction Temperature (°C)

Figure 5. Gate Threshold Variation with Temperature



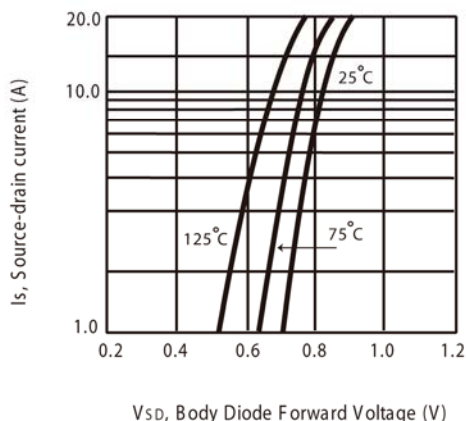
Tj, Junction Temperature (°C)

Figure 6. Breakdown Voltage Variation with Temperature



VGS, Gate-Source Voltage (V)

Figure 7. On-Resistance vs. Gate-Source Voltage



VSD, Body Diode Forward Voltage (V)

Figure 8. Body Diode Forward Voltage Variation with Source Current

CHARACTERISTIC CURVE

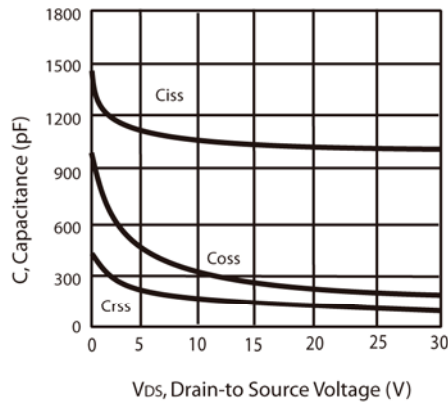


Figure 9. Capacitance

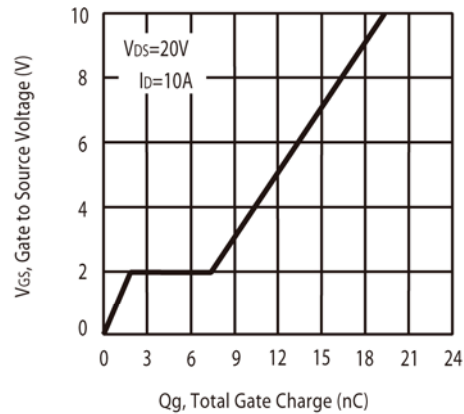


Figure 10. Gate Charge

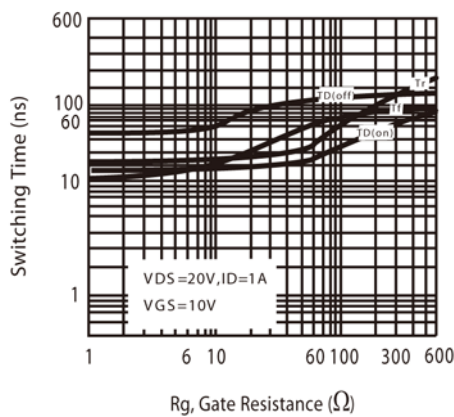


Figure 11. switching characteristics

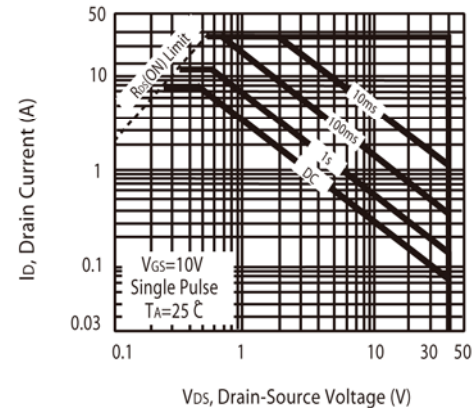


Figure 12. Maximum Safe Operating Area

