

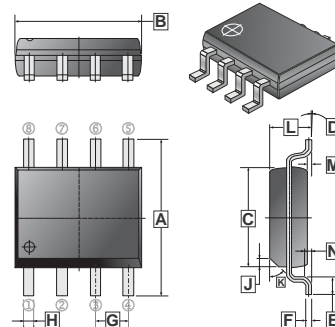
FEATURES

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

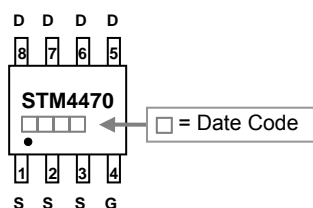
PRODUCT SUMMARY

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$V_{DSS}(V)^d$	$R_{DS(on)}$ m(Ω) 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	$V_{GS} = 0V, I_D = 250\mu A$
Zero Gate Voltage Drain Current	I_{DSS}	-	-	1	μA	$V_{DS} = 32V, V_{GS} = 0V$
Gate-Body Leakage Current	I_{GSS}	-	-	± 100	nA	$V_{GS} = \pm 20V, V_{DS} = 0V$
ON CHARACTERISTICS ^b						
Gate Threshold Voltage	$V_{GS(th)}$	1	1.7	3	V	$V_{DS} = V_{GS}, I_D = 250\mu A$
Drain-Source On-State Resistance	$R_{DS(ON)}$	-	8	10	m Ω	$V_{GS} = 10V, I_D = 10A$
		-	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	$V_{DD} = 20V$ $I_D = 1A$ $V_{GS} = 10V$ $R_{GEN} = 3.3\Omega$
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 $t_f < t_{f \max}$.

CHARACTERISTIC CURVE

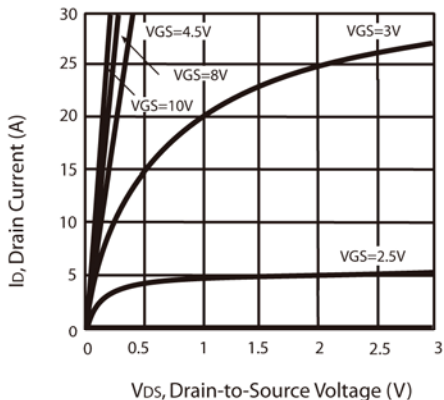


Figure 1. Output Characteristics

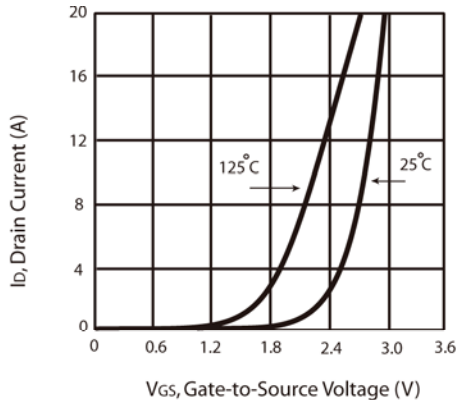


Figure 2. Transfer Characteristics

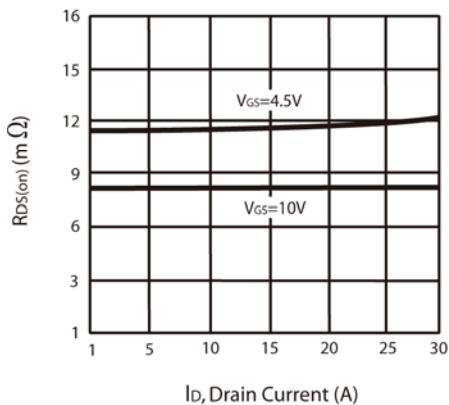


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

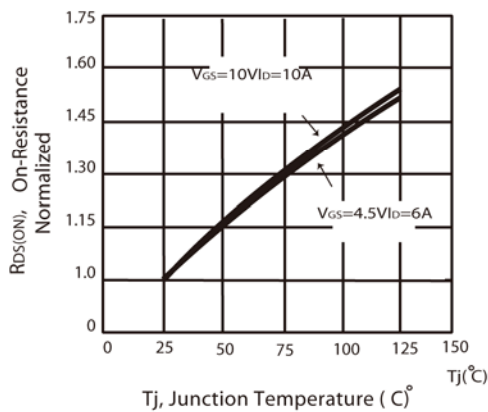


Figure 4. On-Resistance Variation with Drain Current and Temperature

CHARACTERISTIC CURVE

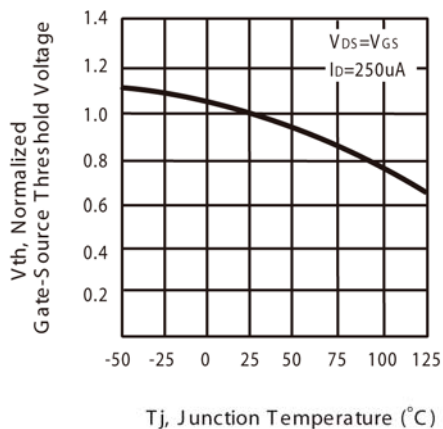


Figure 5. Gate Threshold Variation with Temperature

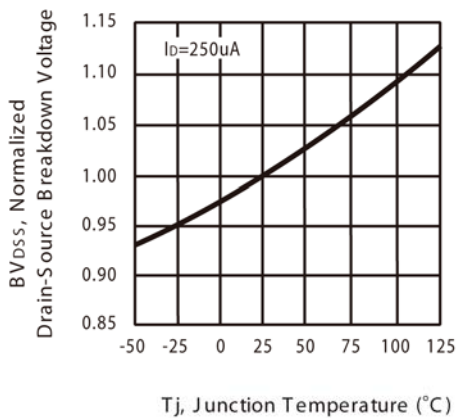


Figure 6. Breakdown Voltage Variation with Temperature

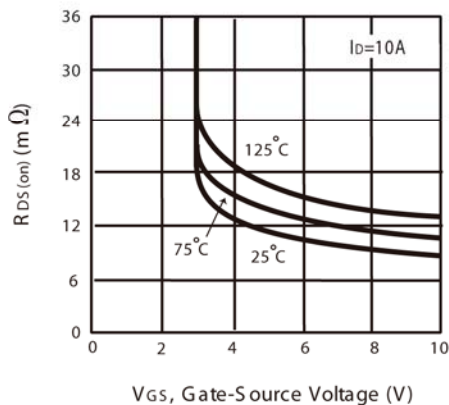


Figure 7. On-Resistance vs. Gate-Source Voltage

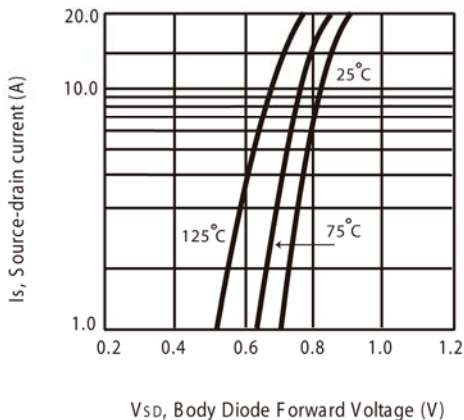


Figure 8. Body Diode Forward Voltage Variation with Source Current

CHARACTERISTIC CURVE

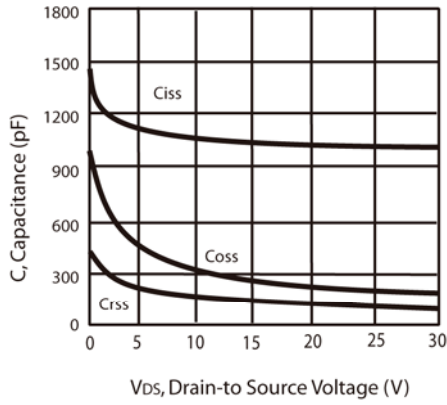


Figure 9. Capacitance

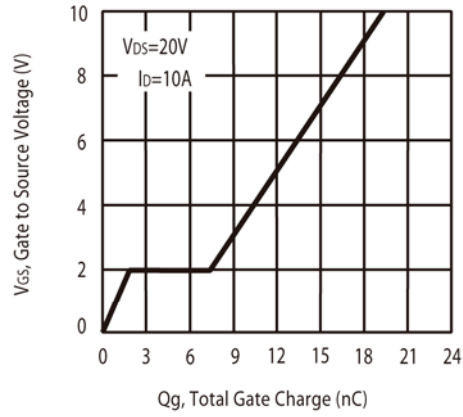


Figure 10. Gate Charge

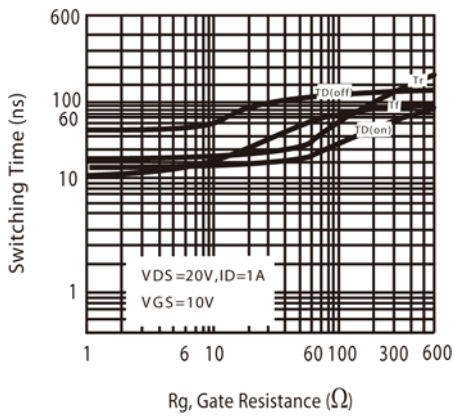


Figure 11. switching characteristics

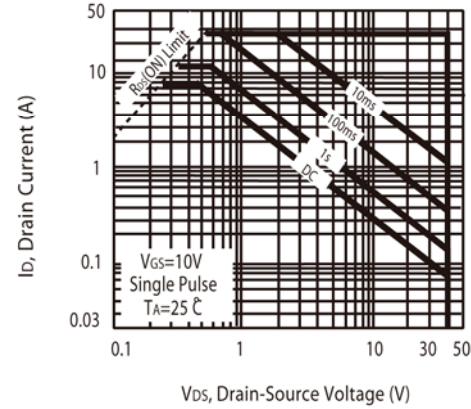


Figure 12. Maximum Safe Operating Area

