

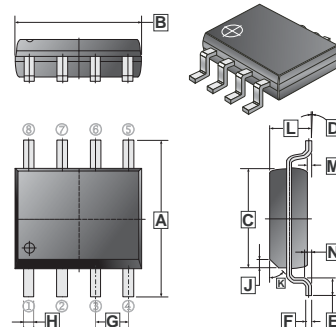
## FEATURES

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

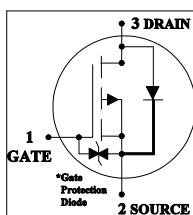
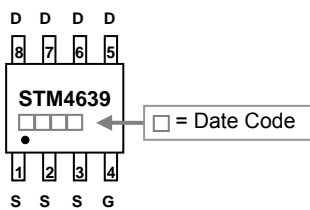
SOP-8

## PRODUCT SUMMARY

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$V_{DSS}(V)$	$R_{DS(on)} m(\Omega)$	$I_D(A)$
-30	8.5@ $V_{GS} = -10V$	-14
	13@ $V_{GS} = -4.5V$	



## 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	$V_{DS}$	-30	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continuous Drain Current <sup>a</sup>	$I_D @ T_A = 25^\circ C$	-14	A
	$I_D @ T_A = 70^\circ C$	-11.2	A
Pulsed Drain Current <sup>b</sup>	$I_{DM}$	-79	A
Single Pulse Avalanche Energy <sup>d</sup>	$E_{AS}$	180	mJ
Maximum Power Dissipation <sup>a</sup>	$P_D @ T_A = 25^\circ C$	2.5	W
	$P_D @ T_A = 70^\circ C$	1.6	W
Operating Junction & Storage Temperature Range	$T_J, T_{STG}$	-55 ~ 150	$^\circ C$
THERMAL RESISTANCE RATINGS			
Thermal Resistance Junction-ambient <sup>a</sup>	$R_{\theta JA}$	50	$^\circ C / W$

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

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNIT	TEST CONDITIONS
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	-30	-	-	V	$V_{GS}=0V, I_D=250\mu A$
Zero Gate Voltage Drain Current	$I_{DSS}$	-	-	-1	$\mu A$	$V_{DS}=-24V, V_{GS}=0V$
Gate-Body Leakage Current	$I_{GSS}$	-	-	$\pm 10$	$\mu A$	$V_{GS}=\pm 20V, V_{DS}=0V$
<b>ON CHARACTERISTICS</b>						
Gate Threshold Voltage	$V_{GS(th)}$	-0.8	-1.7	-2.0	V	$V_{DS}=V_{GS}, I_D=-250\mu A$
Drain-Source On-State Resistance	$R_{DS(ON)}$	-	7	8.5	m $\Omega$	$V_{GS}=-10V, I_D=-14A$
		-	9.8	13		$V_{GS}=-4.5V, I_D=-11.3A$
Forward Transconductance	$g_{fs}$	-	32	-	S	$V_{DS}=-10V, I_D=-14A$
<b>DYNAMIC CHARACTERISTICS <sup>C</sup></b>						
Input Capacitance	$C_{ISS}$	-	4049	-	pF	$V_{DS}=-15V, V_{GS}=0V, f=1.0MHz$
Output Capacitance	$C_{OSS}$	-	641	-		
Reverse Transfer Capacitance	$C_{RSS}$	-	351	-		
<b>SWITCHING CHARACTERISTICS <sup>C</sup></b>						
Turn-On Delay Time	$T_{d(on)}$	-	24	-	nS	$V_{DD}=-15V$ $I_D=-1A$ $V_{GS}=-10V$ $R_{GEN}=3\Omega$
Rise Time	$T_r$	-	68	-		
Turn-Off Delay Time	$T_{d(off)}$	-	484	-		
Fall Time	$T_f$	-	188	-		
Total Gate Charge	$Q_g$	-	95	-	nC	$V_{DS}=-15V, I_D=-14A, V_{GS}=-10V$
		-	40	-		$V_{DS}=-15V, I_D=-14A, V_{GS}=-4.5V$
Gate-Source Charge	$Q_{gs}$	-	6	-		$V_{DS}=-15V, I_D=-14A, V_{GS}=-10V$
Gate-Drain Charge	$Q_{gd}$	-	23	-		
<b>DRAIN-SOURCE DIODE CHARACTERISTICS AND MAXIMUM RATINGS</b>						
Maximum Continuous Drain-Source Diode Forward Current	$I_S$	-	-	-2.0	A	
Diode Forward Voltage <sup>b</sup>	$V_{SD}$	-	-0.7	-1.2	V	$V_{GS}=0V, I_S=-2.0A$

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.
- Starting  $T_J=25^\circ\text{C}$ ,  $L=3.0mH$ ,  $V_{DD}=30V$ ,  $V_{GS}=10V$ . (See Figure13)

**CHARACTERISTIC CURVE**

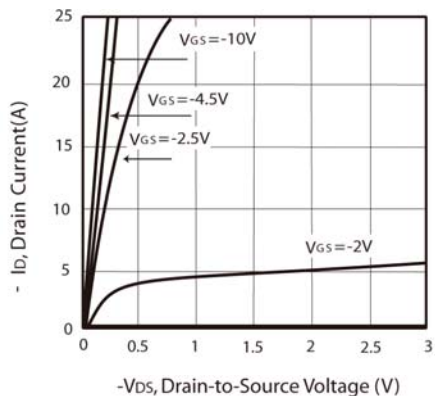


Figure 1. Output Characteristics

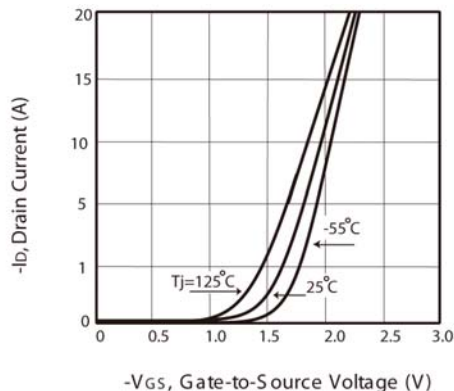


Figure 2. Transfer Characteristics

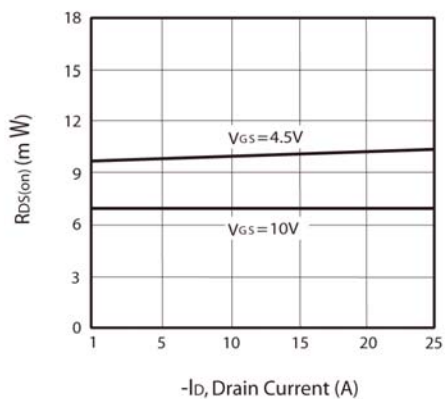


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

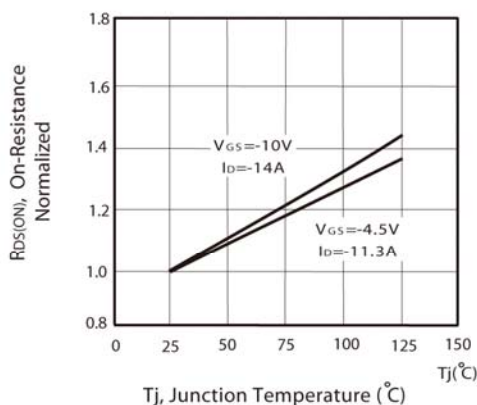


Figure 4. On-Resistance Variation with Drain Current and Temperature

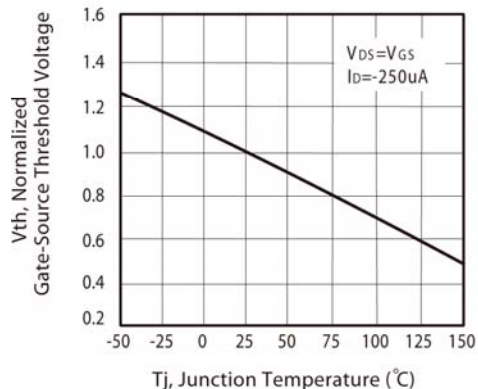


Figure 5. Gate Threshold Variation with Temperature

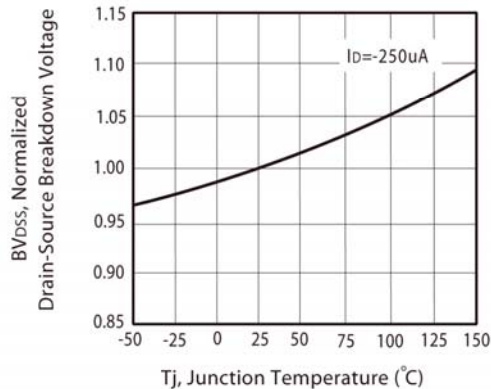


Figure 6. Breakdown Voltage Variation with Temperature

**CHARACTERISTIC CURVE**

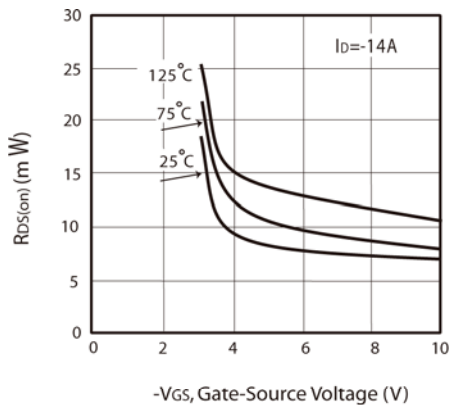


Figure 7. On-Resistance vs. Gate-Source Voltage

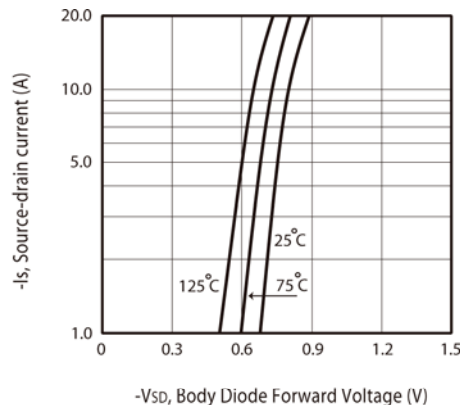


Figure 8. Body Diode Forward Voltage Variation with Source Current

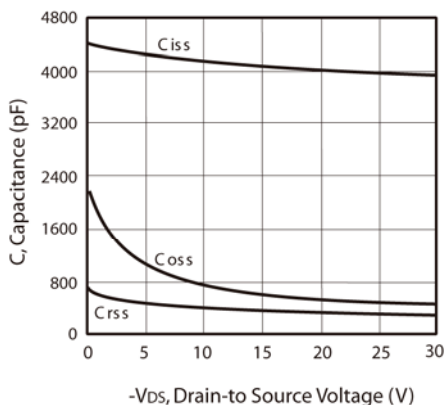


Figure 9. Capacitance

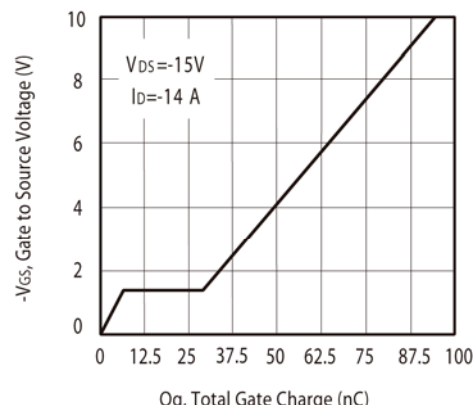


Figure 10. Gate Charge

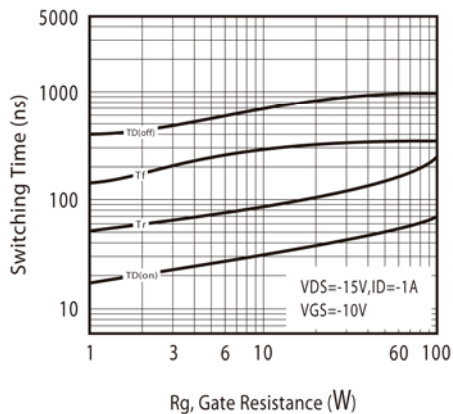


Figure 11. switching characteristics

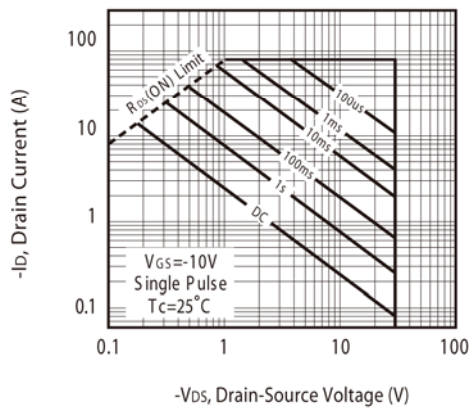
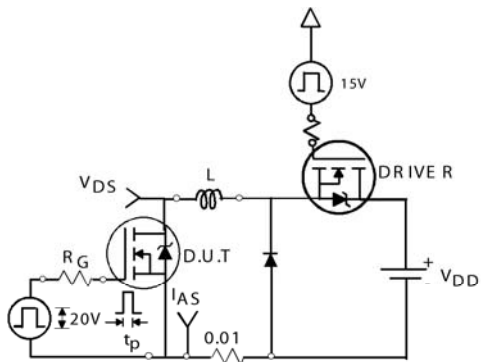


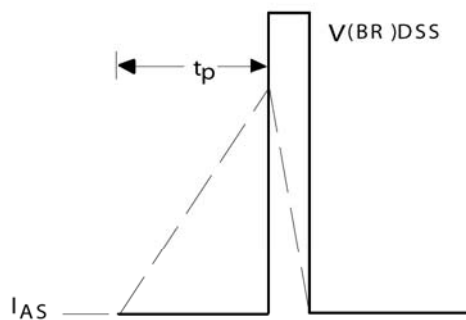
Figure 12. Maximum Safe Operating Area

**CHARACTERISTIC CURVE**



Unclamped Inductive Test Circuit

Figure 13a.



Unclamped Inductive Waveforms

Figure 13b.

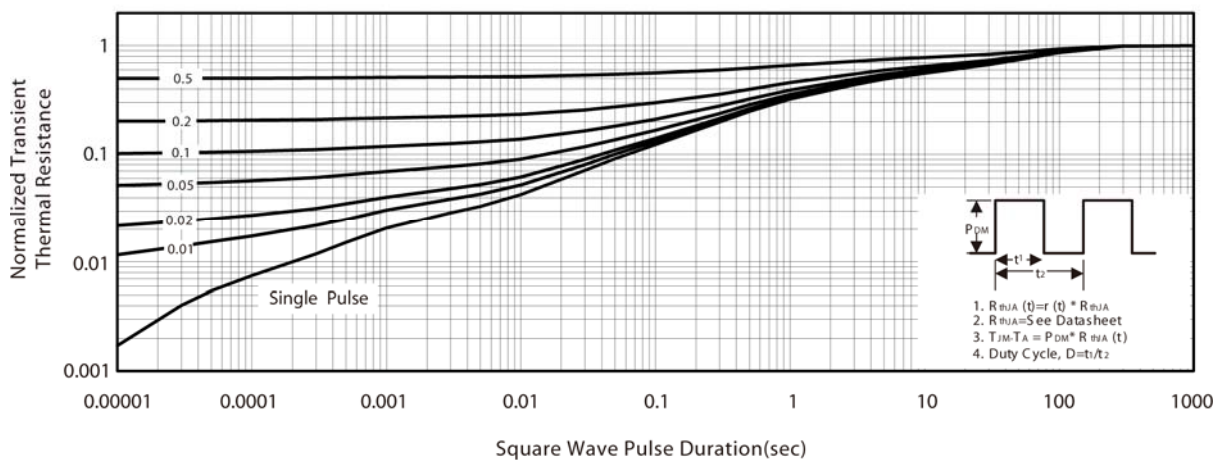


Figure 14. Normalized Thermal Transient Impedance Curve