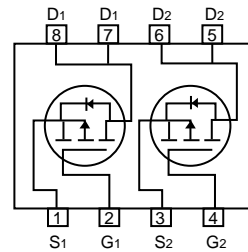
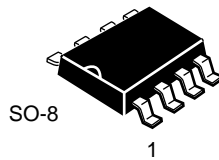


P-Channel Enhancement Mode Field Effect Transistor

PRELIMINARY

FEATURES

- -30V, -6.2A, $R_{DS(ON)} = 33m\Omega$ @ $V_{GS} = -10V$.
 $R_{DS(ON)} = 52m\Omega$ @ $V_{GS} = -4.5V$.
- -30V, -4.9A, $R_{DS(ON)} = 52m\Omega$ @ $V_{GS} = -10V$.
 $R_{DS(ON)} = 85m\Omega$ @ $V_{GS} = -4.5V$.
- Super high dense cell design for extremely low $R_{DS(ON)}$.
- High power and current handling capability.
- Lead free product is acquired.
- Surface mount Package.



ABSOLUTE MAXIMUM RATINGS $T_A = 25^\circ\text{C}$ unless otherwise noted

Parameter	Symbol	Channel 1	Channel 2	Units
Drain-Source Voltage	V_{DS}	-30	-30	V
Gate-Source Voltage	V_{GS}	± 20	± 20	V
Drain Current-Continuous	I_D	-6.2	-4.9	A
Drain Current-Pulsed ^a	I_{DM}	-25	-20	A
Maximum Power Dissipation	P_D	2.0		W
Operating and Store Temperature Range	T_J, T_{stg}	-55 to 150		$^\circ\text{C}$

Thermal Characteristics

Parameter	Symbol	Limit	Units
Thermal Resistance, Junction-to-Ambient ^b	$R_{\theta JA}$	62.5	$^\circ\text{C/W}$

P-Channel(Q1) Electrical Characteristics $T_A = 25\text{ C}$ unless otherwise noted

Parameter	Symbol	Test Condition	Min	Typ	Max	Units
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0V, I_D = -250\mu A$	-30			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -30V, V_{GS} = 0V$			-1	μA
Gate Body Leakage Current, Forward	I_{GSSF}	$V_{GS} = 20V, V_{DS} = 0V$			100	nA
Gate Body Leakage Current, Reverse	I_{GSSR}	$V_{GS} = -20V, V_{DS} = 0V$			-100	nA
On Characteristics^b						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS} = V_{DS}, I_D = -250\mu A$	-1		-3	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS} = -10V, I_D = -6.2A$		27	33	$m\Omega$
		$V_{GS} = -4.5V, I_D = -4A$		40	52	$m\Omega$
Dynamic Characteristics^c						
Forward Transconductance	g_{FS}	$V_{DS} = -10V, I_D = -6.2A$		5		S
Input Capacitance	C_{iss}	$V_{DS} = -15V, V_{GS} = 0V, f = 1.0\text{ MHz}$		1150		pF
Output Capacitance	C_{oss}				250	pF
Reverse Transfer Capacitance	C_{rss}				150	pF
Switching Characteristics^c						
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = -15V, I_D = -1A, V_{GS} = -10V, R_{GEN} = 6\Omega$		13	25	ns
Turn-On Rise Time	t_r			6	15	ns
Turn-Off Delay Time	$t_{d(off)}$			58	115	ns
Turn-Off Fall Time	t_f			22	45	ns
Total Gate Charge	Q_g	$V_{DS} = -15V, I_D = -6.2A, V_{GS} = -10V$		19	25	nC
Gate-Source Charge	Q_{gs}			4.0		nC
Gate-Drain Charge	Q_{gd}			2.5		nC
Drain-Source Diode Characteristics and Maximum Ratings						
Drain-Source Diode Forward Current	I_S				-6.2	A
Drain-Source Diode Forward Voltage ^b	V_{SD}	$V_{GS} = 0V, I_S = -1A$			-1.2	V
Notes : a.Repetitive Rating : Pulse width limited by maximum junction temperature. b.Pulse Test : Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$. c.Guaranteed by design, not subject to production testing.						

P-Channel(Q2) Electrical Characteristics $T_A = 25\text{ C}$ unless otherwise noted

Parameter	Symbol	Test Condition	Min	Typ	Max	Units
Off Characteristics						
Drain-Source Breakdown Voltage	BV_{DSS}	$V_{GS} = 0V, I_D = -250\mu A$	-30			V
Zero Gate Voltage Drain Current	I_{DSS}	$V_{DS} = -30V, V_{GS} = 0V$			-1	μA
Gate Body Leakage Current, Forward	I_{GSSF}	$V_{GS} = 20V, V_{DS} = 0V$			100	nA
Gate Body Leakage Current, Reverse	I_{GSSR}	$V_{GS} = -20V, V_{DS} = 0V$			-100	nA
On Characteristics ^c						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{GS} = V_{DS}, I_D = -250\mu A$	-1		-3	V
Static Drain-Source On-Resistance	$R_{DS(on)}$	$V_{GS} = -10V, I_D = -4.9A$		42	52	$m\Omega$
		$V_{GS} = -4.5V, I_D = -3.6A$		65	85	$m\Omega$
Forward Transconductance	g_{FS}	$V_{DS} = -15V, I_D = -4.9A$	5	8		S
Dynamic Characteristics ^d						
Input Capacitance	C_{iss}	$V_{DS} = -15V, V_{GS} = 0V,$ $f = 1.0\text{ MHz}$		845		pF
Output Capacitance	C_{oss}			155		pF
Reverse Transfer Capacitance	C_{rss}			95		pF
Switching Characteristics ^d						
Turn-On Delay Time	$t_{d(on)}$	$V_{DD} = -15V, I_D = -1A,$ $V_{GS} = -10V, R_{GEN} = 6\Omega$		11	22	ns
Turn-On Rise Time	t_r			4	8	ns
Turn-Off Delay Time	$t_{d(off)}$			59	118	ns
Turn-Off Fall Time	t_f			23	46	ns
Total Gate Charge	Q_g	$V_{DS} = -15V, I_D = -4.9A,$ $V_{GS} = -10V$		13.8	18.3	nC
Gate-Source Charge	Q_{gs}			1.8		nC
Gate-Drain Charge	Q_{gd}			2.2		nC
Drain-Source Diode Characteristics and Maximum Ratings						
Drain-Source Diode Forward Current ^b	I_S				-4.9	A
Drain-Source Diode Forward Voltage ^c	V_{SD}	$V_{GS} = 0V, I_S = -4.9A$			-1.2	V
Notes : a.Repetitive Rating : Pulse width limited by maximum junction temperature. b.Surface Mounted on FR4 Board, $t \leq 10\text{ sec}$. c.Pulse Test : Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$. d.Guaranteed by design, not subject to production testing.						

CHANNEL 1

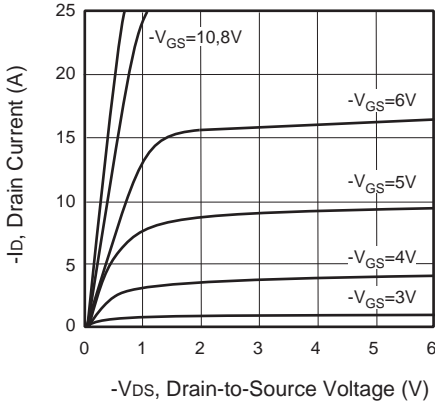


Figure 1. Output Characteristics

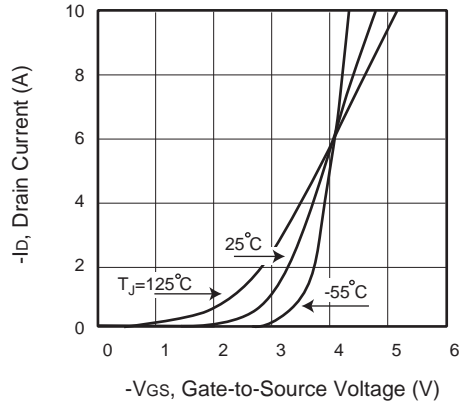


Figure 2. Transfer Characteristics

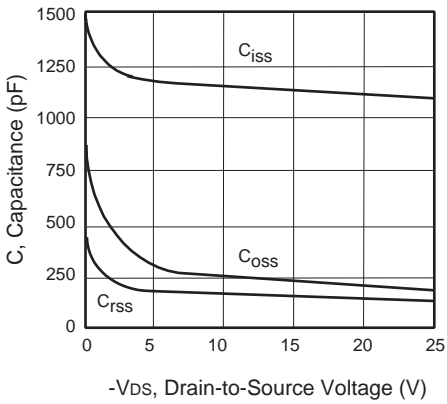


Figure 3. Capacitance

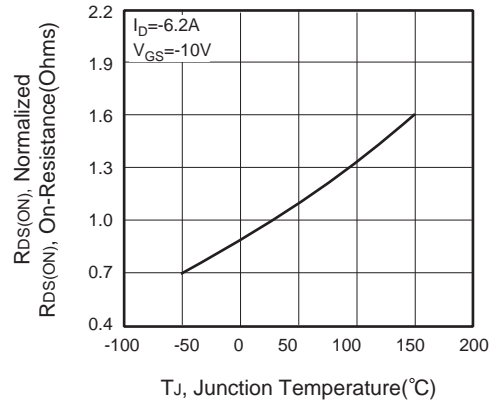


Figure 4. On-Resistance Variation with Temperature

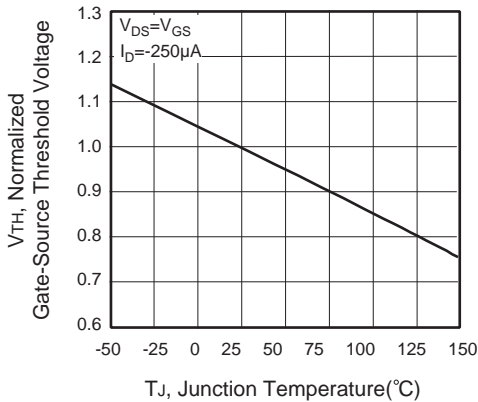


Figure 5. Gate Threshold Variation with Temperature

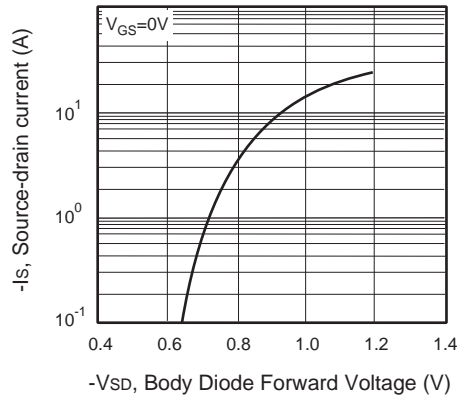


Figure 6. Body Diode Forward Voltage Variation with Source Current

CHANNEL 2

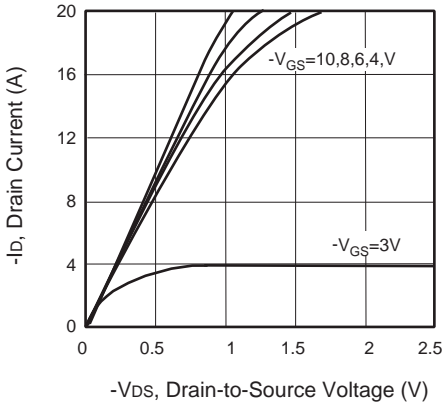


Figure 7. Output Characteristics

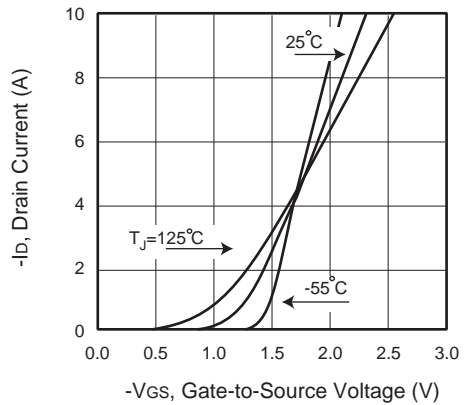


Figure 8. Transfer Characteristics

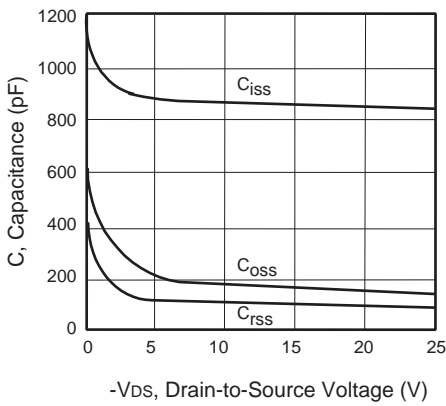


Figure 9. Capacitance

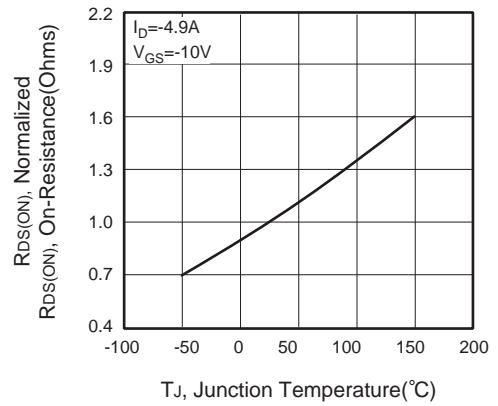


Figure 10. On-Resistance Variation with Temperature

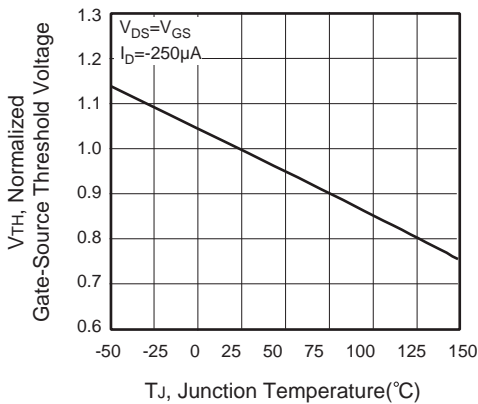


Figure 11. Gate Threshold Variation with Temperature

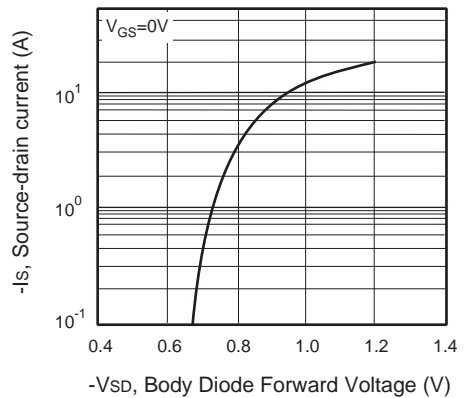


Figure 12. Body Diode Forward Voltage Variation with Source Current

CHANNEL 1

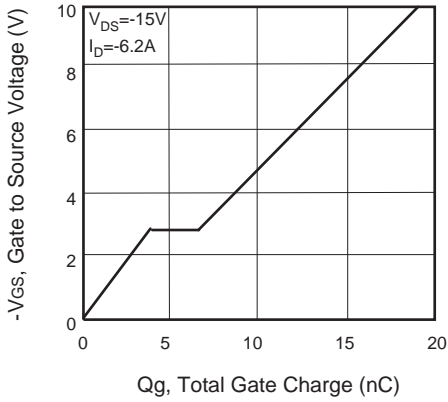


Figure 13. Gate Charge

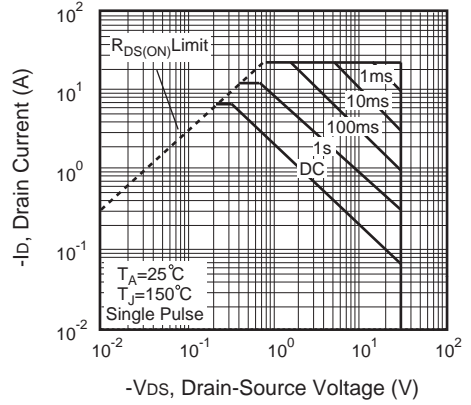


Figure 14. Maximum Safe Operating Area

CHANNEL 2

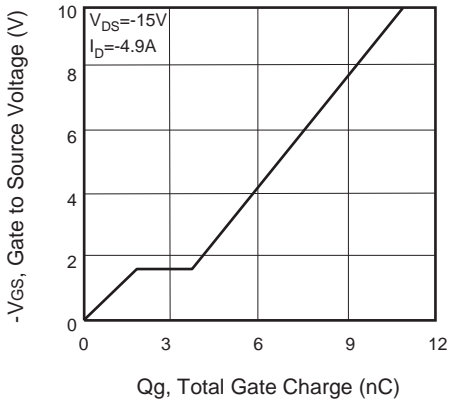


Figure 15. Gate Charge

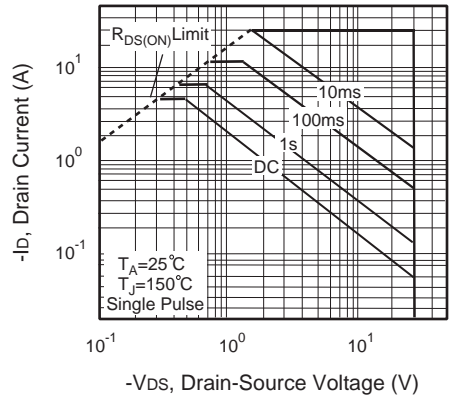


Figure 16. Maximum Safe Operating Area

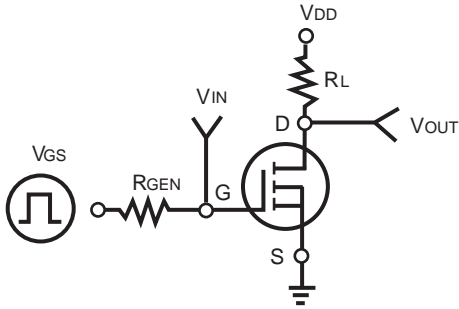


Figure 17. Switching Test Circuit

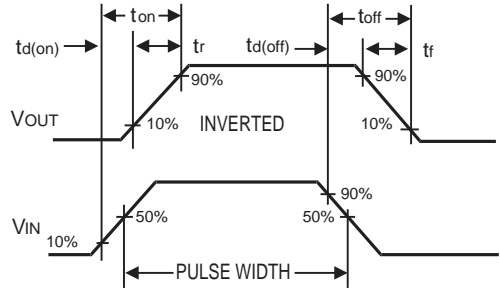


Figure 18. Switching Waveforms

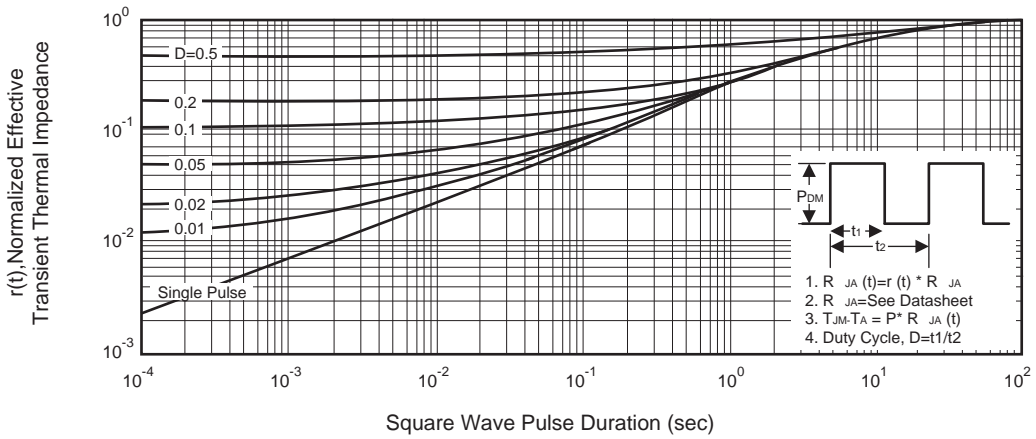


Figure 19. Normalized Thermal Transient Impedance Curve