

## P-channel Enhancement Mode Power MOSFET

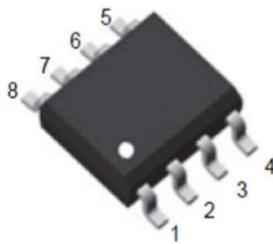
### Features

- $V_{DS} = -60V$ ,  $I_D = -7A$   
 $R_{DS(ON)} < 55m\Omega$  @  $V_{GS} = -10V$   
 $R_{DS(ON)} < 65m\Omega$  @  $V_{GS} = -4.5V$

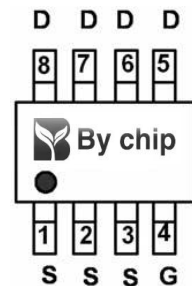
### General Features

- Advanced Trench Technology
- Provide Excellent  $R_{DS(ON)}$  and Low Gate Charge
- Lead Free and Green Available

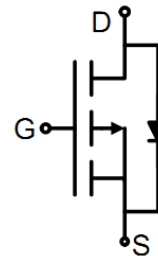
100% UIS TESTED!  
 100%  $\Delta V_{ds}$  TESTED!



SOP-8



pin assignment



Schematic diagram

### Absolute Maximum Ratings ( $T_C=25^\circ C$ unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	$V_{DS}$	-60	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Drain Current-Continuous	$I_D$	-7	A
Pulsed Drain Current	$I_{DM}$	-30	A
Maximum Power Dissipation	$P_D$	3.0	W
Single pulse avalanche energy <sup>(Note 5)</sup>	$E_{AS}$	65	mJ
Operating Junction and Storage Temperature Range	$T_J, T_{STG}$	-55 To 150	$^\circ C$

### Thermal Characteristic

Thermal Resistance, Junction-to-Ambient <sup>(Note 2)</sup>	$R_{\theta JC}$	41.7	$^\circ C/W$
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**Electrical Characteristics ( $T_C=25^{\circ}\text{C}$  unless otherwise noted)**

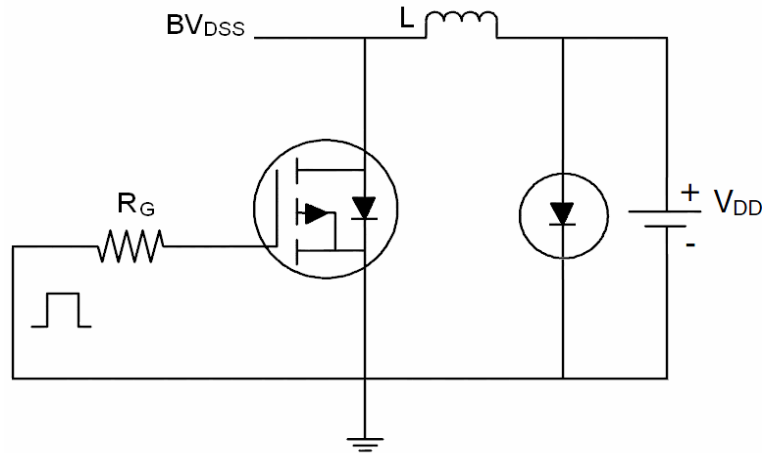
Parameter	Symbol	Condition	Min	Typ	Max	Unit
<b>Off Characteristics</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS}=0V, I_D=-250\mu A$	-60	-	-	V
Zero Gate Voltage Drain Current	$I_{DSS}$	$V_{DS}=-60V, V_{GS}=0V$	-	-	-1	$\mu A$
Gate-Body Leakage Current	$I_{GSS}$	$V_{GS}=\pm 20V, V_{DS}=0V$	-	-	$\pm 100$	nA
<b>On Characteristics</b> (Note 3)						
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}, I_D=-250\mu A$	-1.0		-3.0	V
Drain-Source On-State Resistance	$R_{DS(on)}$	$V_{GS}=-10V, I_D=-7A$	-		55	m $\Omega$
		$V_{GS}=-4.5V, I_D=-7A$	-		65	m $\Omega$
Forward Transconductance	$g_{FS}$	$V_{DS}=-5V, I_D=-7A$	-	15	-	S
<b>Dynamic Characteristics</b> (Note 4)						
Input Capacitance	$C_{iss}$	$V_{DS}=-30V, V_{GS}=0V,$ $F=1.0\text{MHz}$	-	1108	-	PF
Output Capacitance	$C_{oss}$		-	73.7	-	PF
Reverse Transfer Capacitance	$C_{rss}$		-	58.2	-	PF
<b>Switching Characteristics</b> (Note 4)						
Turn-on Delay Time	$t_{d(on)}$	$V_{DD}=-30V, R_L=4.2\Omega,$ $V_{GS}=-10V, R_G=3\Omega$	-	8	-	nS
Turn-on Rise Time	$t_r$		-	4	-	nS
Turn-Off Delay Time	$t_{d(off)}$		-	32	-	nS
Turn-Off Fall Time	$t_f$		-	7	-	nS
Total Gate Charge	$Q_g$	$V_{DS}=-30V, I_D=-7A,$ $V_{GS}=-10V$	-	23.4	-	nC
Gate-Source Charge	$Q_{gs}$		-	4.1	-	nC
Gate-Drain Charge	$Q_{gd}$		-	4.8	-	nC
<b>Drain-Source Diode Characteristics</b>						
Diode Forward Voltage (Note 3)	$V_{SD}$	$V_{GS}=0V, I_S=-7A$	-		-1.2	V
Diode Forward Current (Note 2)	$I_S$		-	-	-7	A
Reverse Recovery Time	$t_{rr}$	$T_J = 25^{\circ}\text{C}, I_F = -7A$	-	25		nS
Reverse Recovery Charge	$Q_{rr}$	$di/dt = -100A/\mu s$ (Note 3)	-	31		nC

**Notes:**

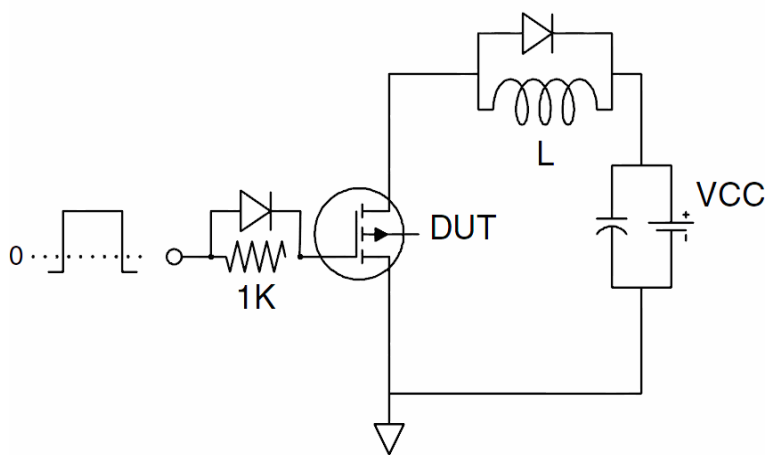
1. Repetitive Rating: Pulse width limited by maximum junction temperature.
2. Surface Mounted on FR4 Board,  $t \leq 10$  sec.
3. Pulse Test: Pulse Width  $\leq 300\mu s$ , Duty Cycle  $\leq 2\%$ .
4. Guaranteed by design, not subject to production

**Test Circuit**

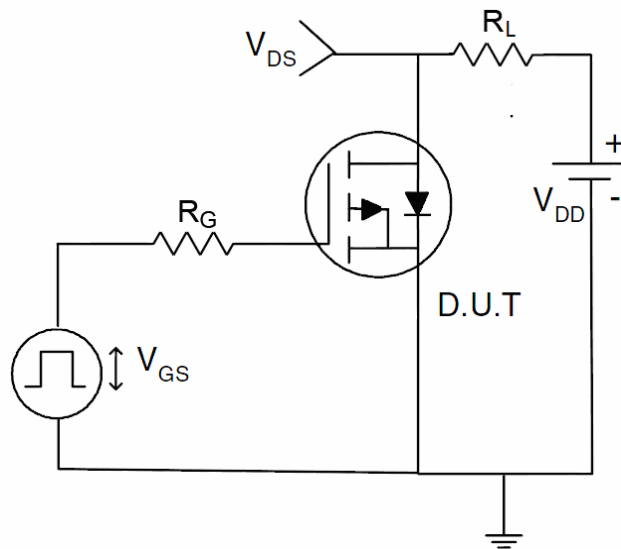
**1) E<sub>AS</sub> Test Circuit**



**2) Gate Charge Test Circuit**



**3) Switch Time Test Circuit**



Typical Electrical and Thermal Characteristics (Curves)

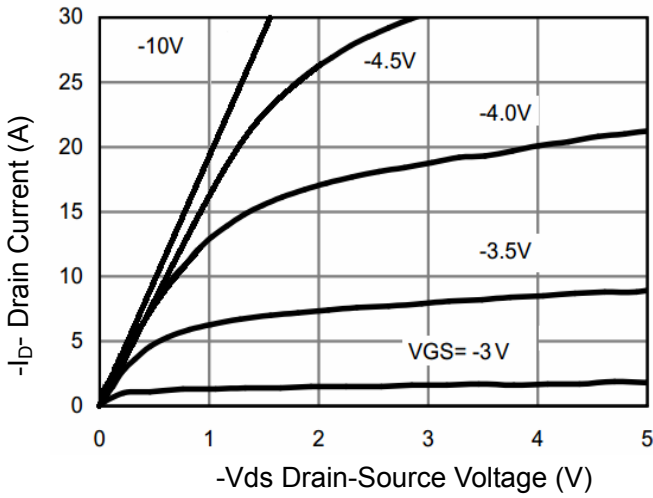


Figure 1 Output Characteristics

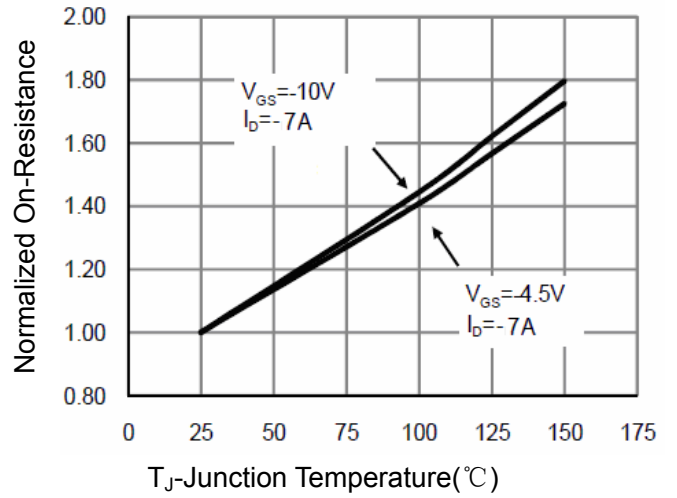


Figure 4 Rds(on)-Junction Temperature

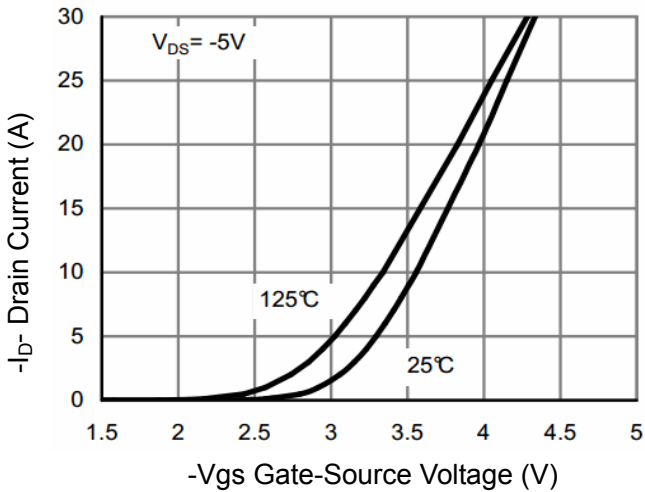


Figure 2 Transfer Characteristics

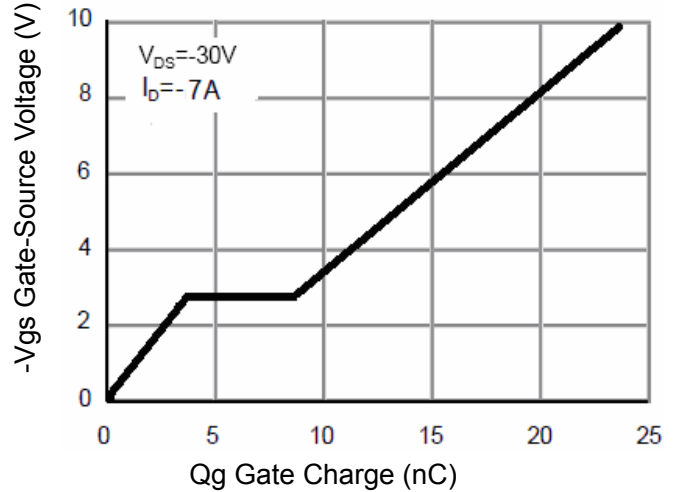


Figure 5 Gate Charge

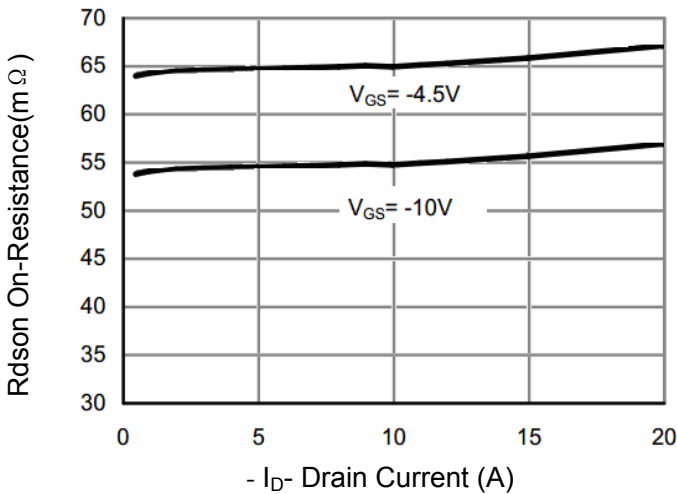


Figure 3 Rds(on)- Drain Current

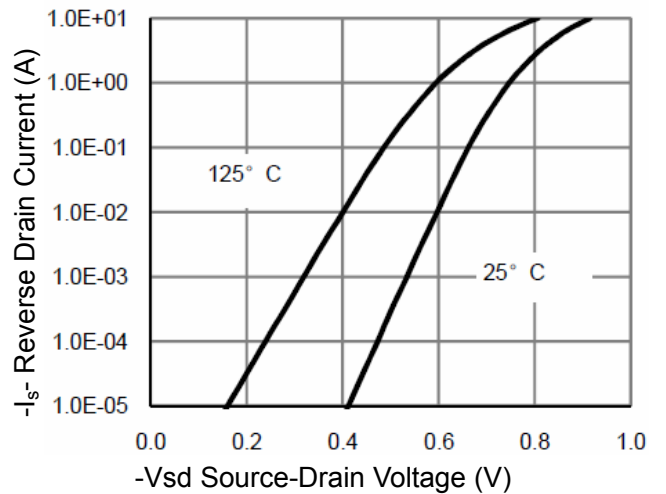


Figure 6 Source- Drain Diode Forward

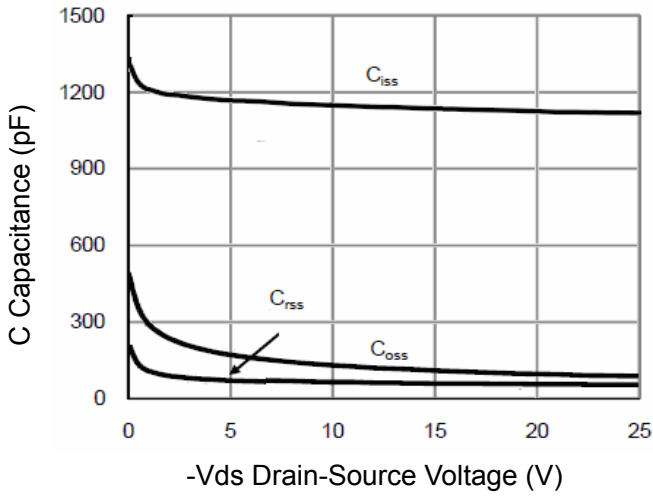


Figure 7 Capacitance vs Vds

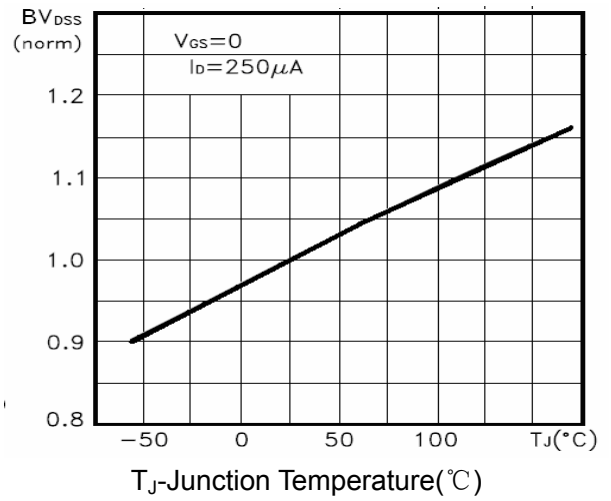


Figure 9  $BV_{DSS}$  vs Junction Temperature

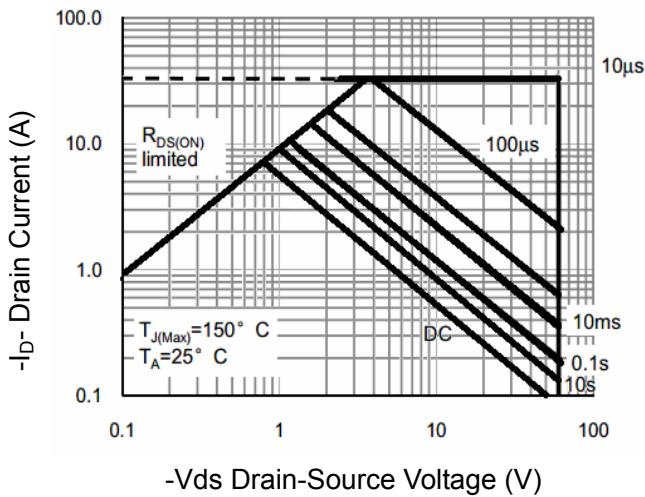


Figure 8 Safe Operation Area

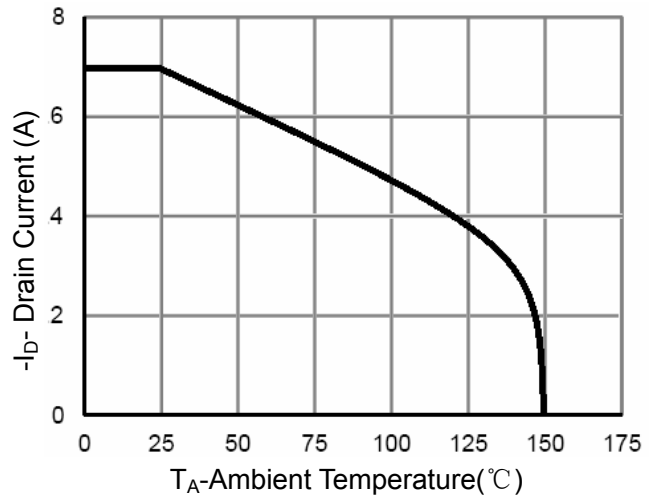


Figure 10  $I_D$  Current De-rating

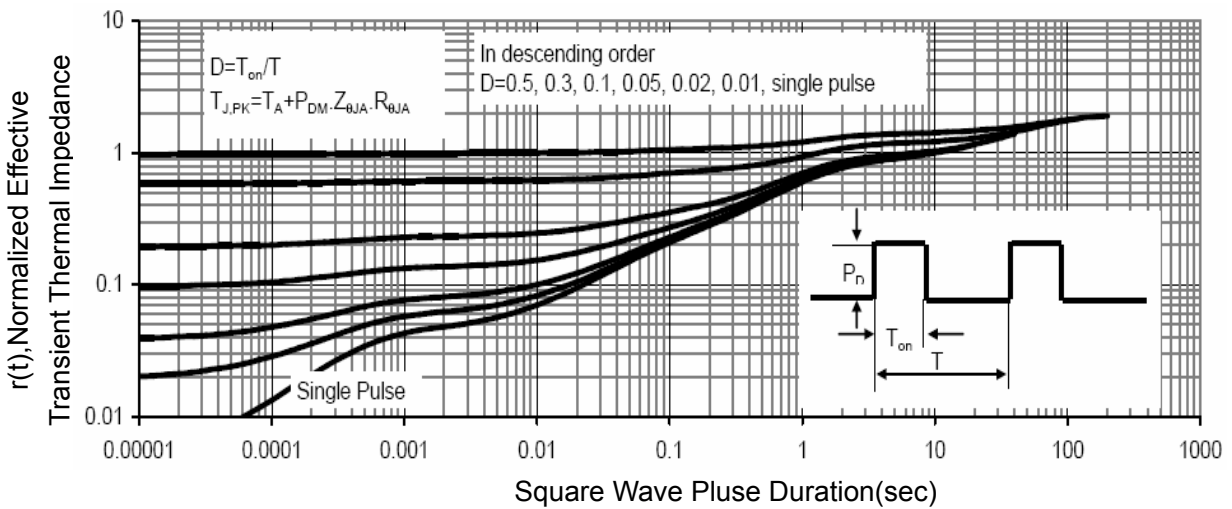


Figure 11 Normalized Maximum Transient Thermal Impedance