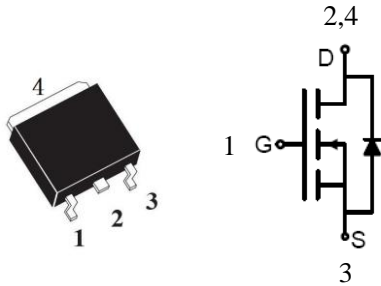


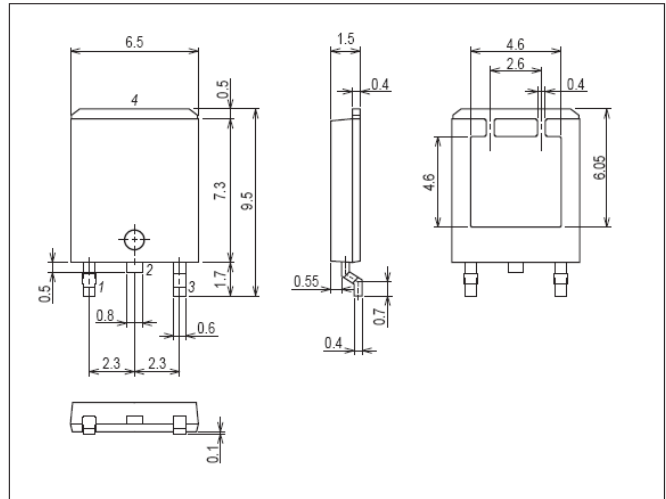
Features

- Low On resistance.
- 4.5V drive.
- RoHS compliant.



Package Dimensions

TO-252



Specifications

Absolute Maximum Ratings at $T_a=25^{\circ}C$

Parameter	Symbol	Conditions	Ratings	Unit
Drain-to-Source Voltage	V_{DSS}		60	V
Gate-to-Source Voltage	V_{GSS}		± 20	V
Drain Current (DC)	I_D		12	A
Drain Current (Pulse)	I_{DP}	$PW \leq 10\mu S$, duty cycle $\leq 1\%$	25	A
Allowable Power Dissipation	P_D	Mounted on a ceramic board (1000mm ² ×0.8mm) 1unit	40	W
Total Dissipation	P_T	Mounted on a ceramic board (1000mm ² ×0.8mm)	40	W
Channel Temperature	T_{ch}		150	$^{\circ}C$
Storage Temperature	T_{stg}		-55~+150	$^{\circ}C$

Electrical Characteristics at $T_a=25^{\circ}C$

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D=250\mu A$, $V_{GS}=0V$	60	66	-	V
Zero-Gate Voltage Drain Current	I_{DSS}	$V_{DS}=60V$, $V_{GS}=0V$	-	-	1	μA
Gate-to-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20V$, $V_{DS}=0V$	-	-	± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$, $I_D=250\mu A$	1	1.70	2.5	V
Static Drain-to-Source On-State Resistance	$R_{DS(ON)}$	$I_D=12A$, $V_{GS}=10V$	-	30	40	m Ω
	$R_{DS(ON)}$	$I_D=7A$, $V_{GS}=4.5V$	-	33	50	m Ω
Input Capacitance	C_{iss}	$V_{DS}=30V$, $V_{GS}=0V$, $f=1MHz$	-	510	-	pF
Output Capacitance	C_{oss}	$V_{DS}=30V$, $V_{GS}=0V$, $f=1MHz$	-	60	-	pF
Reverse Transfer Capacitance	C_{rss}	$V_{DS}=30V$, $V_{GS}=0V$, $f=1MHz$	-	23	-	pF

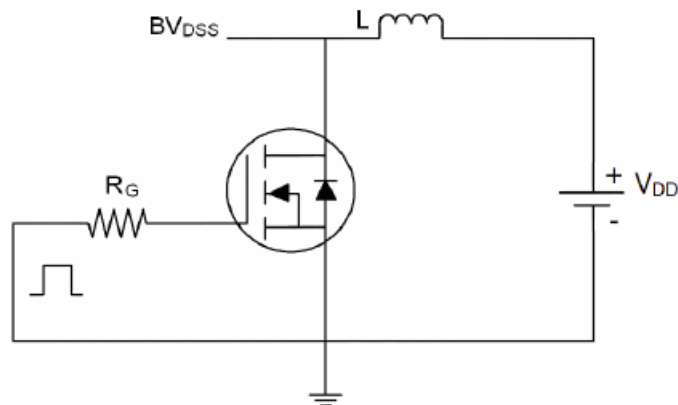
Si6040

Electrical Characteristics at $T_a=25^{\circ}\text{C}$ (Continued)

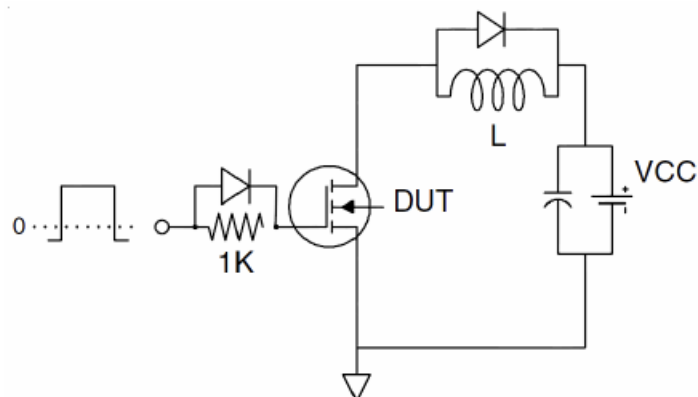
Parameter	Symbol	Conditions	Ratings			Unit
			min	Typ	max	
Turn-on Delay Time	$t_{d(on)}$	$V_{DS}=30\text{V}, I_D=1.5\text{A}, R_{GEN}=1\Omega,$ $V_{GS}=10\text{V}$	-	6	-	nS
Rise Time	t_r		-	3	-	nS
Turn-off Delay Time	$t_{d(off)}$		-	16	-	nS
Fall Time	t_f		-	2.8	-	nS
Total Gate Charge	Q_g	$V_{DS}=30\text{V}, V_{GS}=4.5\text{V}, I_D=3\text{A}$	-	11	-	nC
Gate-to-Source Charge	Q_{gs}		-	5	-	nC
Gate-to-Drain "Miller" Charge	Q_{gd}		-	4.8	-	nC
Diode Forward Voltage	V_{SD}	$I_S=3\text{A}, V_{GS}=0\text{V}$	-	0.88	1.2	V

Test circuit

1) E_{AS} test Circuits



2) Gate charge test Circuit:



Typical Characteristics at $T_a=25^{\circ}\text{C}$

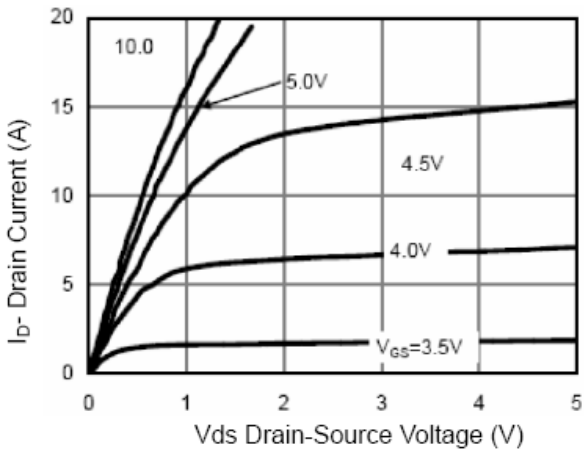


Figure 1 Output Characteristics

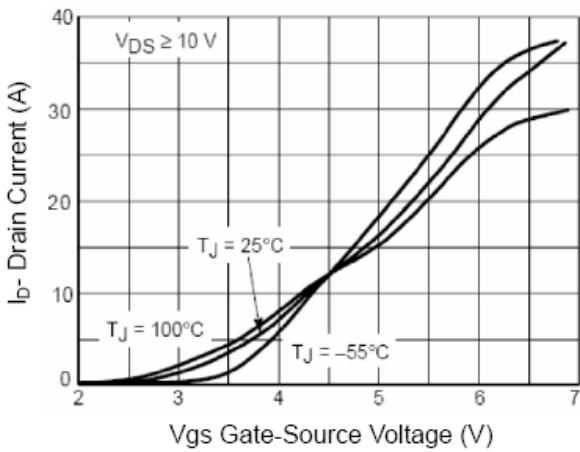


Figure 2 Transfer Characteristics

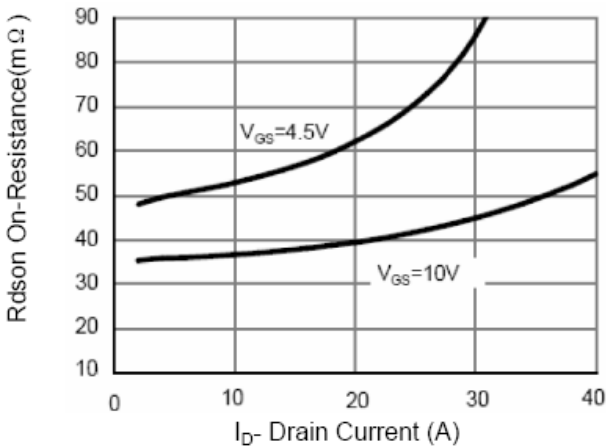


Figure 3 $R_{DS(on)}$ - Drain Current

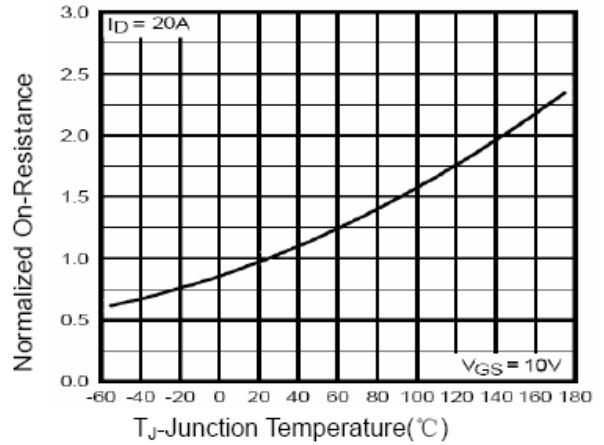


Figure 4 $R_{DS(on)}$ -Junction Temperature

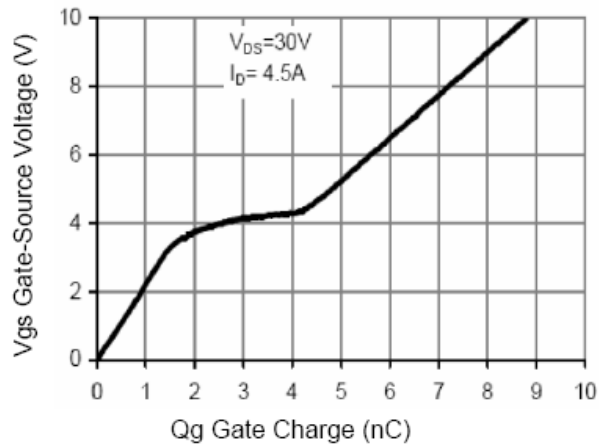


Figure 5 Gate Charge

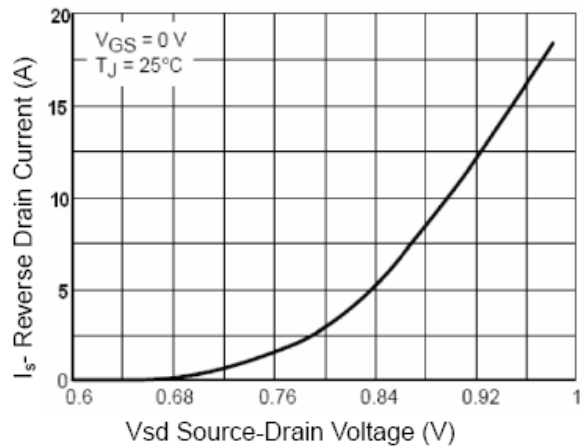


Figure 6 Source- Drain Diode Forward

Typical Characteristics at $T_a=25^{\circ}\text{C}$ (Continued)

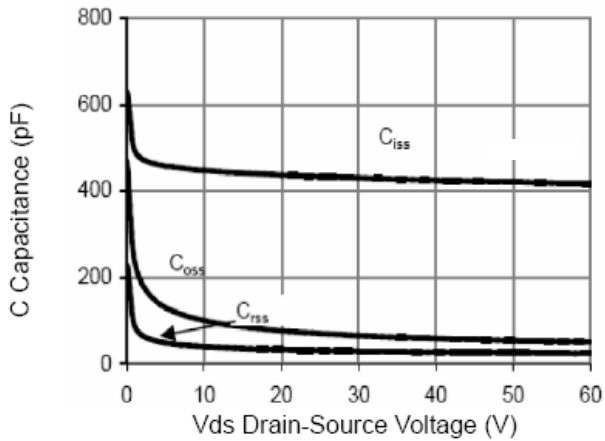


Figure 7 Capacitance vs Vds

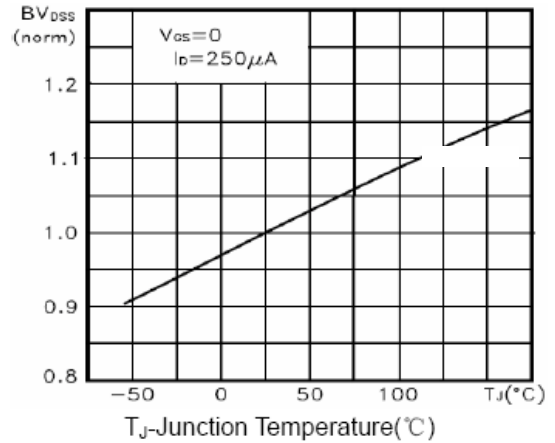


Figure 9 BV_{DSS} vs Junction Temperature

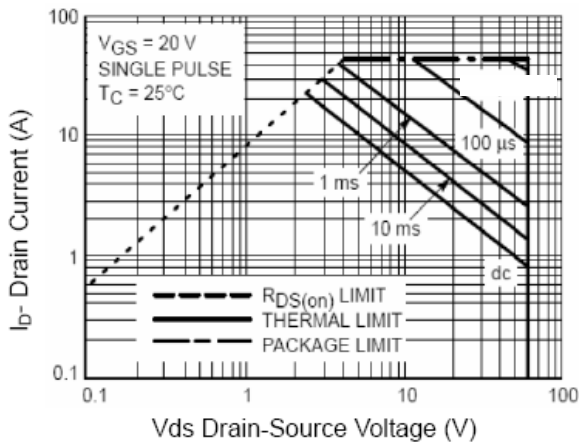


Figure 8 Safe Operation Area

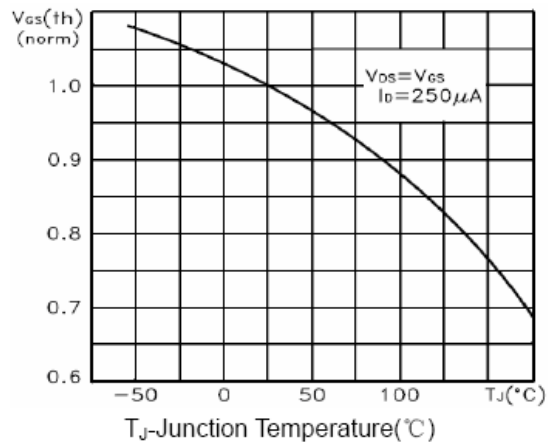


Figure 10 $V_{GS(th)}$ vs Junction Temperature

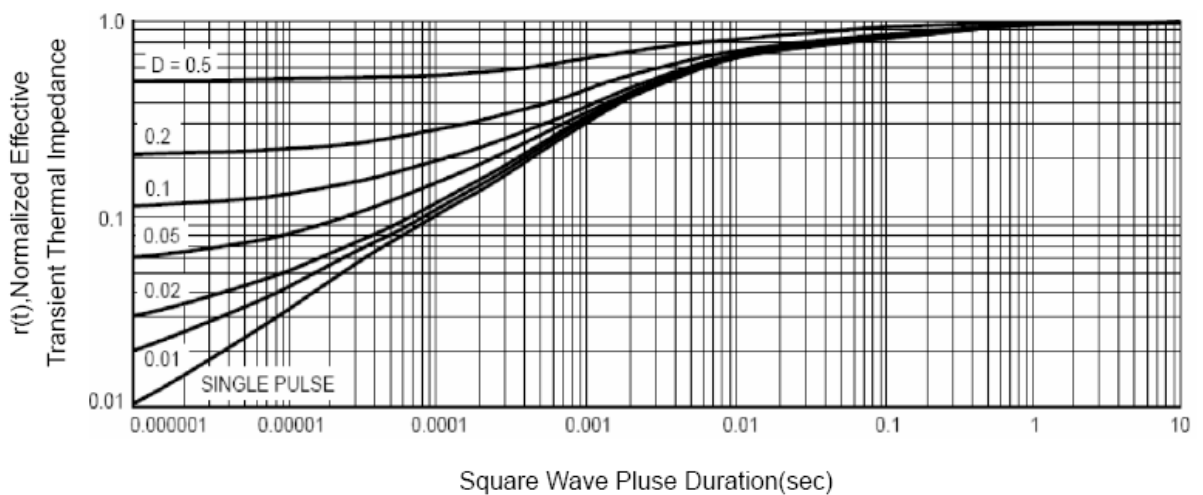


Figure 11 Normalized Maximum Transient Thermal Impedance