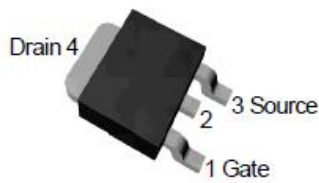


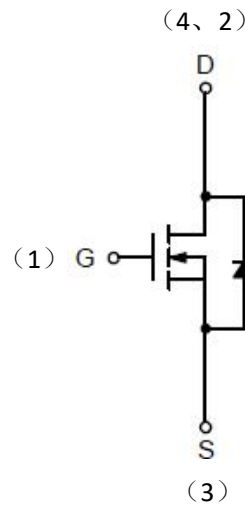
Features

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



Top View of TO-252

Pin Description



Specifications

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

Parameter	Symbol	Conditions	Ratings	Unit
Drain-to-Source Voltage	V_{DSS}		40	V
Gate-to-Source Voltage	V_{GSS}		± 20	V
Drain Current (DC)	I_D		130	A
Drain Current (Pulse)	I_{DP}	$PW \leq 10\mu\text{s}$, duty cycle $\leq 1\%$	520	A
Allowable Power Dissipation	P_D	Mounted on a ceramic board (1000mm ² ×0.8mm) 1unit	72.7	W
Channel Temperature	T_{ch}		150	$^{\circ}\text{C}$
Storage Temperature	T_{stg}		-55~+150	$^{\circ}\text{C}$

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

Parameter	Symbol	Conditions	Ratings			Unit
			min	typ	max	
Drain-to-Source Breakdown Voltage	$V_{(BR)DSS}$	$I_D=250\mu\text{A}$, $V_{GS}=0$	40	-	-	V
Zero-Gate Voltage Drain Current	I_{DSS}	$V_{DS}=40\text{V}$, $V_{GS}=0$	-	-	1	μA
Gate-to-Source Leakage Current	I_{GSS}	$V_{GS}=\pm 20\text{V}$, $V_{DS}=0$	-	-	± 100	nA
Gate Threshold Voltage	$V_{GS(th)}$	$V_{DS}=V_{GS}$, $I_D=250\mu\text{A}$	1.1	-	2.2	V
Forward Transconductance	g_{FS}	$V_{DS}=5\text{V}$, $I_D=20\text{A}$	-	105	-	S
Static Drain-to-Source On-State Resistance	$R_{DS(ON)}^1$	$I_D=30\text{A}$, $V_{GS}=10\text{V}$	-	2.5	2.8	m Ω
	$R_{DS(ON)}^2$	$I_D=30\text{A}$, $V_{GS}=4.5\text{V}$	-	3.3	3.8	m Ω
Input Capacitance	C_{iss}	$V_{DS}=20\text{V}$, $V_{GS}=0\text{V}$, $f=1\text{MHz}$	-	2800	-	pF
Output Capacitance	C_{oss}	$V_{DS}=20\text{V}$, $V_{GS}=0\text{V}$, $f=1\text{MHz}$	-	1070	-	pF
Reverse Transfer Capacitance	C_{rss}	$V_{DS}=20\text{V}$, $V_{GS}=0\text{V}$, $f=1\text{MHz}$	-	110	-	pF

Si40N130

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

Parameter	Symbol	Conditions	Ratings			Unit
			min	Typ	max	
Turn-on Delay Time	$t_{d(on)}$	$V_{GS}=10\text{V}, I_D=20\text{A}, R_L=25\Omega, R_{GEN}=3.0\Omega$	-	4	-	nS
Rise Time	t_r		-	5	-	nS
Turn-off Delay Time	$t_{d(off)}$		-	35	-	nS
Fall Time	t_f		-	11	-	nS
Total Gate Charge	Q_g	$V_{DS}=20\text{V}, V_{GS}=10\text{V}, I_D=20\text{A}$	-	46	-	nC
Gate-to-Source Charge	Q_{gs}		-	8.7	-	nC
Gate-to-Drain "Miller" Charge	Q_{gd}		-	5.4	-	nC
Diode Forward Voltage	V_{SD}	$I_S=50\text{A}, V_{GS}=0$	-	0.83	-	V

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

Fig.1 Output characteristics

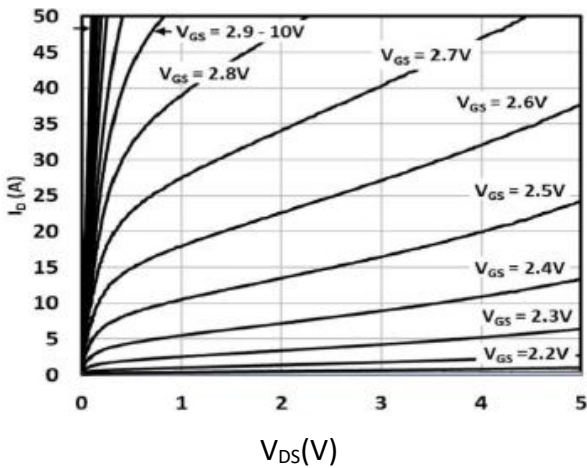


Fig.2 Transfer characteristics

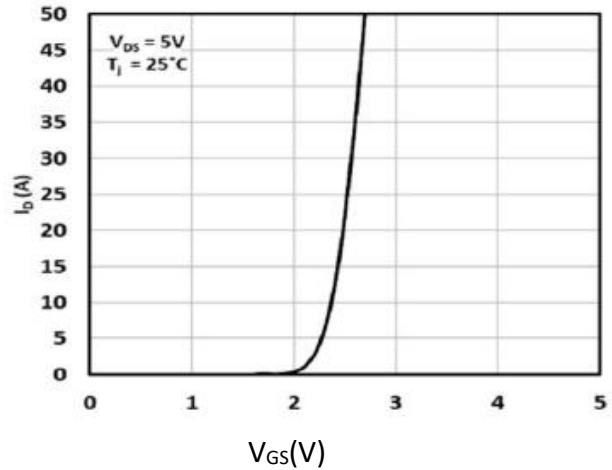


Fig.3 On-resistance vs. gate voltage

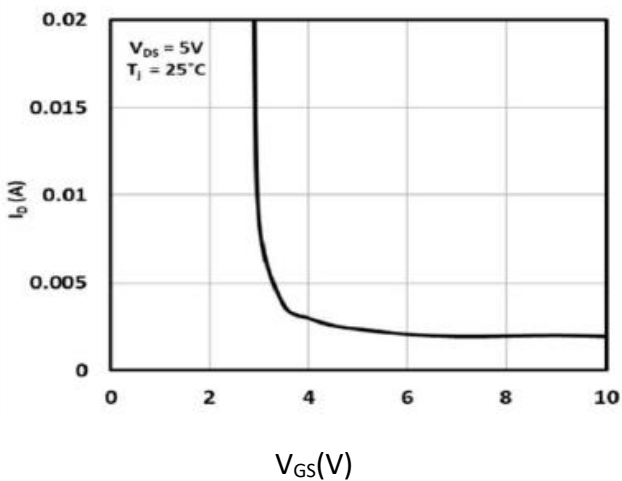


Fig.4 On-resistance vs. drain current

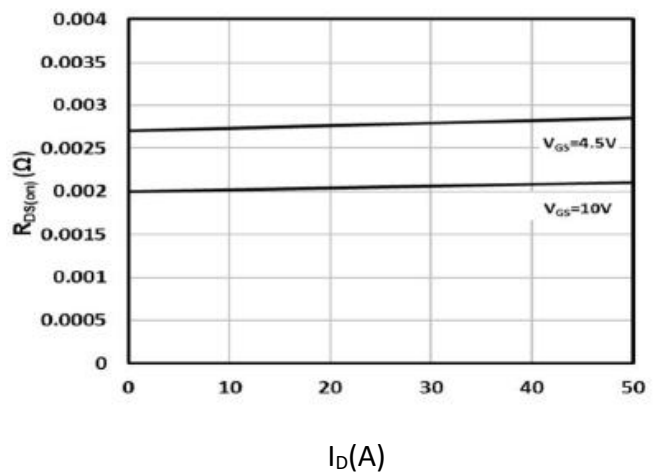


Fig.5 Source-to-drain diode forward characteristics

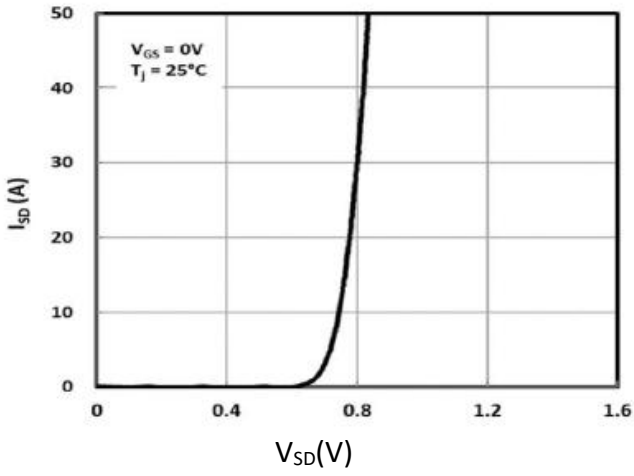


Fig.6 Capacitance vs. drain-to-source voltage

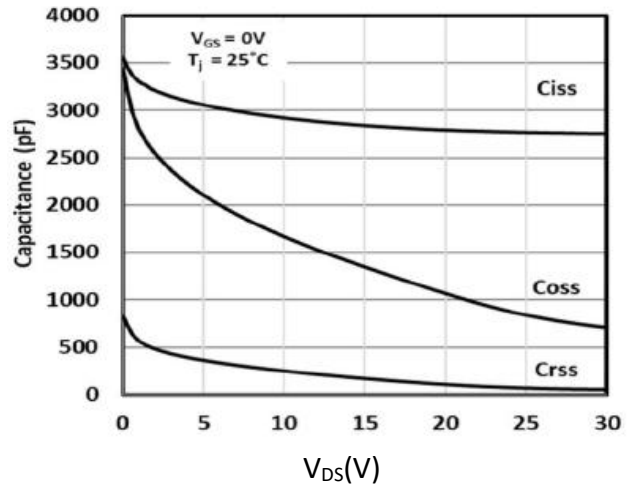


Fig.7 Maximum drain current VS. case temperature

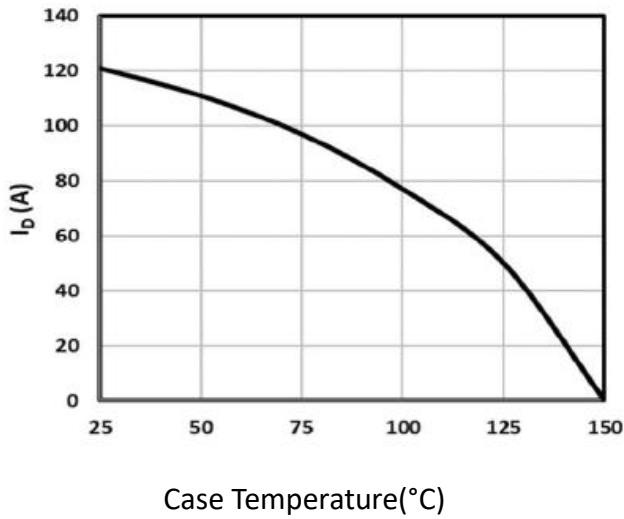


Fig. 8 Maximum drain current Vs. ambient temperature

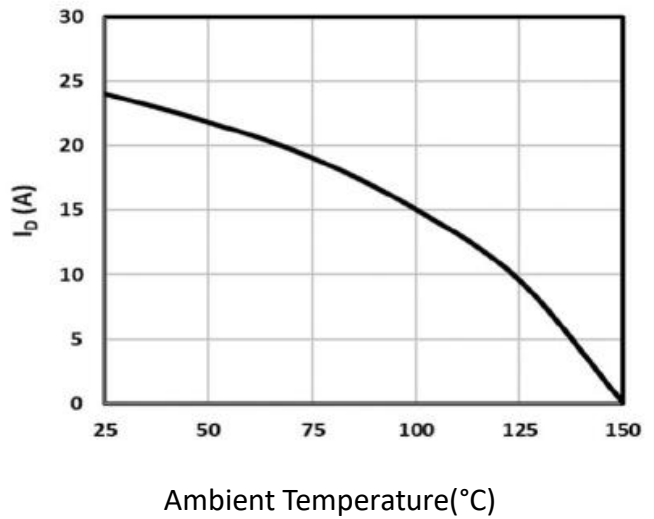


Fig.9 Gate-to-source voltage vs. gate charge

