

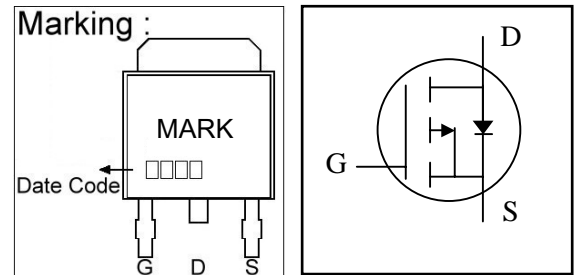
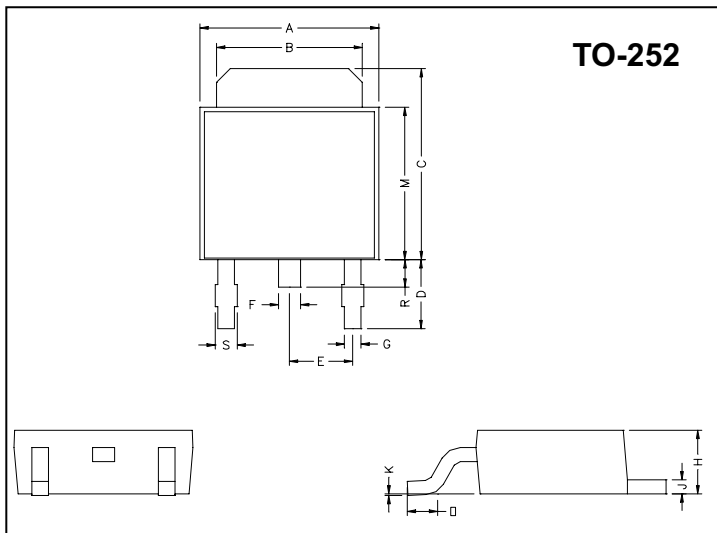
**P-CHANNEL ENHANCEMENT MODE
POWER MOSFET**

BV_{DSS}	-30V
$R_{DS(ON)}$	50m Ω
I_D	- 20A

Description

Advanced Power MOSFETs utilized advanced processing techniques to achieve the lowest possible on-resistance, extremely efficient and cost-effectiveness device.

The TO-252/TO-251 package is widely used for commercial-industrial application.

Package Dimensions


REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	6.40	6.80	G	0.50	0.70
B	5.20	5.50	H	2.20	2.40
C	6.80	7.20	J	0.45	0.55
D	2.40	3.00	K	0	0.15
E	2.30 REF.		L	0.90	1.50
F	0.70	0.90	M	5.40	5.80
S	0.60	0.90	R	0.80	1.20

Absolute Maximum Ratings

Symbol	Parameter	Rating	Units
V_{DS}	Drain-Source Voltage	- 30	V
V_{GS}	Gate-Source Voltage	± 20	V
$I_D@T_C=25^\circ C$	Continuous Drain Current	- 20	A
$I_D@T_C=100^\circ C$	Continuous Drain Current	-13	A
I_{DM}	Pulsed Drain Current ¹	-60	A
$P_D@T_C=25^\circ C$	Total Power Dissipation	12.5	W
	Linear Derating Factor	0.1	W/ $^\circ C$
T_{STG}	Storage Temperature Range	-55 to 150	$^\circ C$
T_J	Operating Junction Temperature Range	-55 to 150	$^\circ C$

Thermal Data

Symbol	Parameter	Value	Units
Rthj-c	Maximum Thermal Resistance, Junction-case	10	$^\circ C/W$
Rthj-a	Maximum Thermal Resistance, Junction-ambient	110	$^\circ C/W$

Electrical Characteristics @ $T_J=25^\circ\text{C}$ (unless otherwise specified)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
BV_{DSS}	Drain-Source Breakdown Voltage	$V_{GS}=0V, I_D=-250\mu A$	-30	-	-	V
$R_{DS(ON)}$	Static Drain-Source On-Resistance ²	$V_{GS}=-10V, I_D=-10A$	-	-	50	$m\Omega$
		$V_{GS}=-4.5V, I_D=-5A$	-	-	90	$m\Omega$
$V_{GS(th)}$	Gate Threshold Voltage	$V_{DS}=V_{GS}, I_D=-250\mu A$	-1	-	-3	V
g_{fs}	Forward Transconductance	$V_{DS}=-10V, I_D=-10A$	-	10	-	S
I_{DSS}	Drain-Source Leakage Current ($T_J=25^\circ\text{C}$)	$V_{DS}=-30V, V_{GS}=0V$	-	-	-1	μA
	Drain-Source Leakage Current ($T_J=150^\circ\text{C}$)	$V_{DS}=-24V, V_{GS}=0V$	-	-	-25	μA
I_{GSS}	Gate-Source Leakage	$V_{GS}=\pm 20V$	-	-	± 100	nA
Q_g	Total Gate Charge ²	$I_D=-10A$	-	8	16	nC
Q_{gs}	Gate-Source Charge	$V_{DS}=-24V$	-	1.6	-	nC
Q_{gd}	Gate-Drain ("Miller") Charge	$V_{GS}=-4.5V$	-	4.3	-	nC
$t_{d(on)}$	Turn-on Delay Time ²	$V_{DS}=-15V$	-	6.3	-	ns
t_r	Rise Time	$I_D=-10A$	-	46	-	ns
$t_{d(off)}$	Turn-off Delay Time	$R_G=3.3\Omega, V_{GS}=-10V$	-	20	-	ns
t_f	Fall Time	$R_D=1.5\Omega$	-	7.4	-	ns
C_{iss}	Input Capacitance	$V_{GS}=0V$	-	570	740	pF
C_{oss}	Output Capacitance	$V_{DS}=-25V$	-	80	-	pF
C_{rss}	Reverse Transfer Capacitance	$f=1.0\text{MHz}$	-	75	-	pF

Source-Drain Diode

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V_{SD}	Forward On Voltage ²	$I_S=-10A, V_{GS}=0V$	-	-	-1.3	V
t_{rr}	Reverse Recovery Time ²	$I_S=-10A, V_{GS}=0V,$	-	18	-	ns
Q_{rr}	Reverse Recovery Charge	$dI/dt=-100A/\mu s$	-	10	-	nC

Notes:

1. Pulse width limited by Max. junction temperature.
2. Pulse test

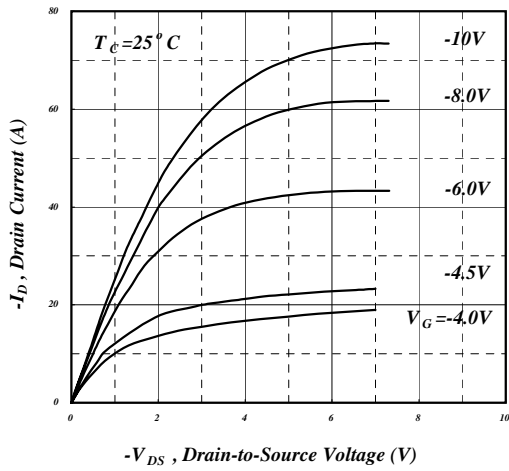


Fig 1. Typical Output Characteristics

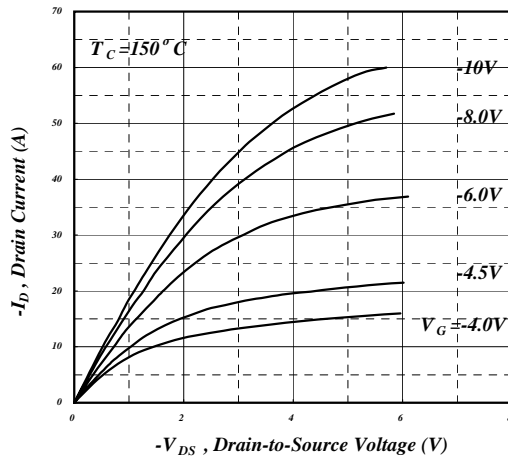


Fig 2. Typical Output Characteristics

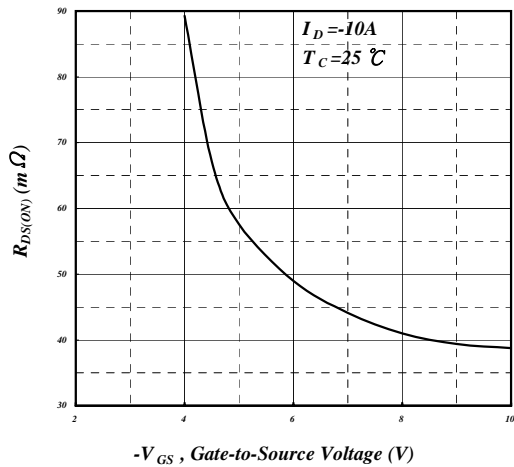


Fig 3. On-Resistance v.s. Gate Voltage

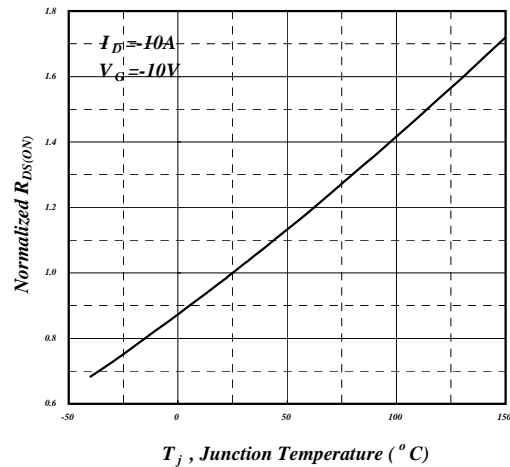


Fig 4. Normalized On-Resistance v.s. Junction Temperature

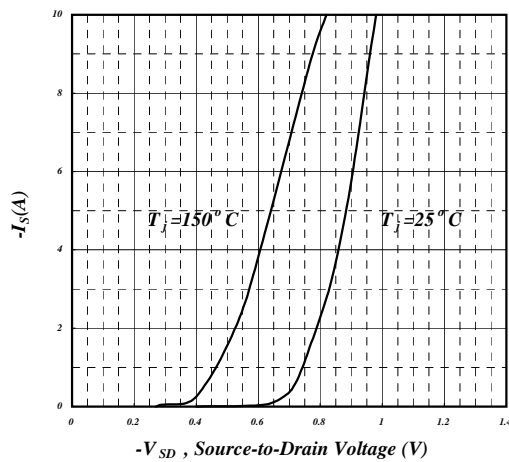


Fig5. Forward Characteristic of Reverse Diode

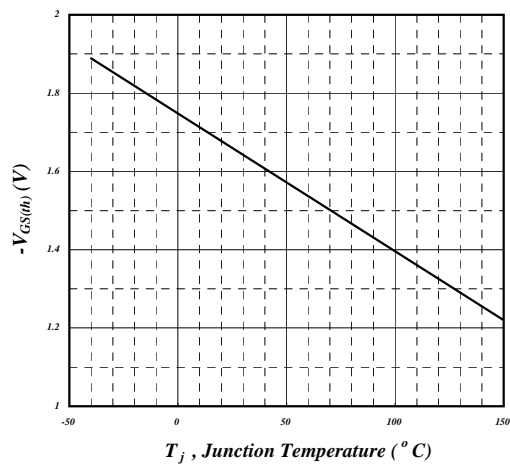


Fig 6. Gate Threshold Voltage v.s. Junction Temperature

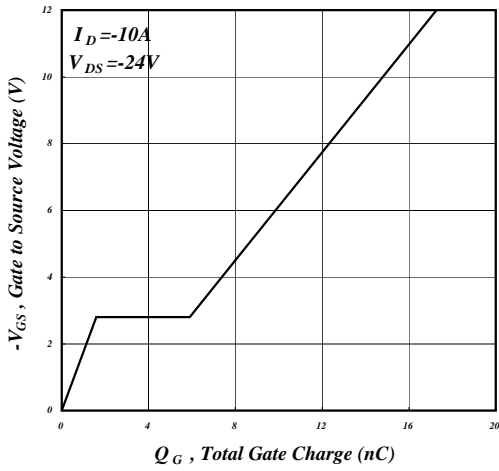


Fig 7. Gate Charge Characteristics

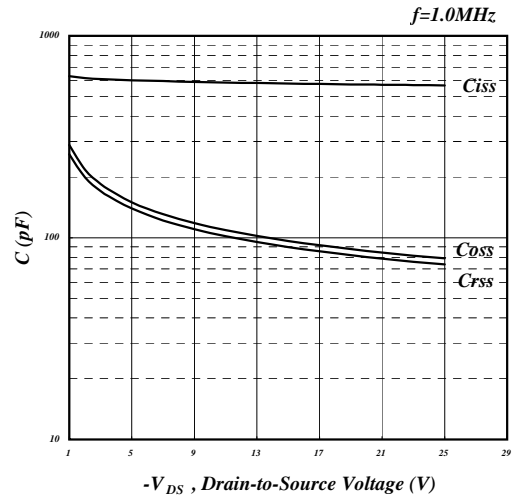


Fig 8. Typical Capacitance Characteristics

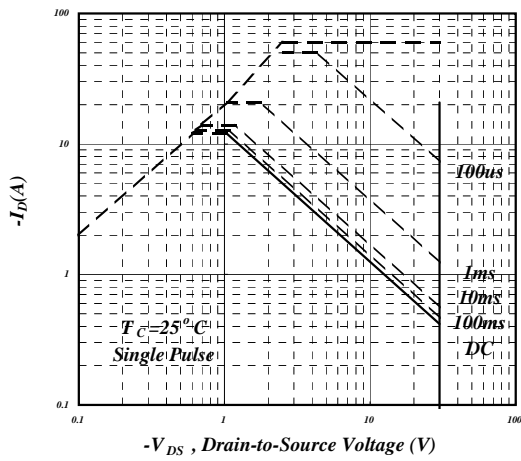


Fig 9. Maximum Safe Operating Area

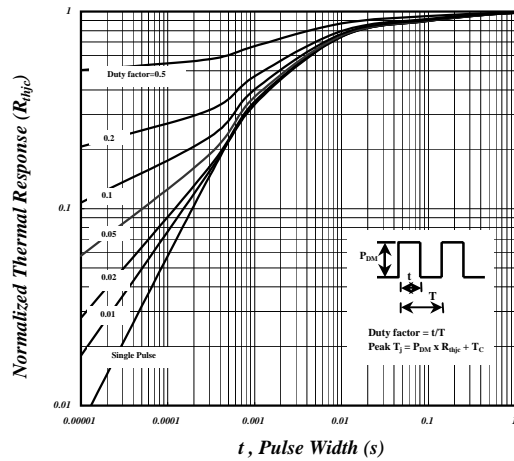


Fig 10. Effective Transient Thermal Impedance

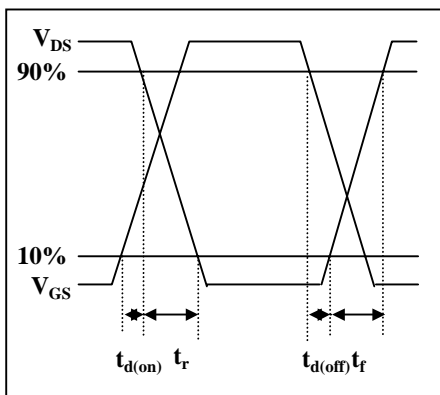


Fig 11. Switching Time Waveform

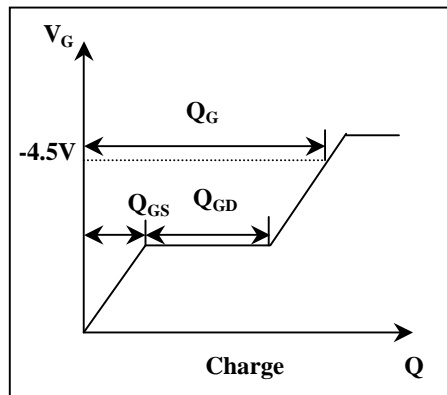


Fig 12. Gate Charge Waveform