

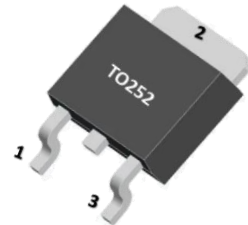
50A, 30V N-CHANNEL ENHANCEMENT MODE POWER MOSFET

DESCRIPTION

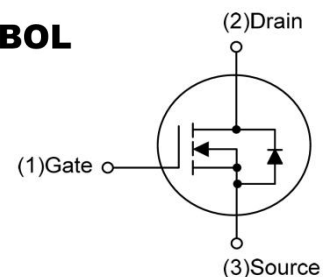
The 50N03 meet the ROHS and Green Product requirement with full function reliability approved.

FEATURES

- * $R_{DS(ON)} \leq 10 \text{ m}\Omega$ @ $V_{GS}=10\text{V}$, $I_D=25\text{A}$
- * $R_{DS(ON)} \leq 15 \text{ m}\Omega$ @ $V_{GS}=4.5\text{V}$, $I_D=25\text{A}$
- * Low capacitance
- * Optimized gate charge
- * Fast switching capability
- * Avalanche energy specified



SYMBOL



ABSOLUTE MAXIMUM RATINGS(TA=25°C, unless otherwise specified.)

SYMBOL	PARAMETER	VALUE	UNIT
VDSS	Drain-Source Voltage	30	V
VGSS	Gate-Source Voltage	±20	V
ID	Continuous Drain Current	50	A
IDM	Pulsed Drain Current (Note 2)	100	A
EAS	Single Pulsed Avalanche Energy (Note 3)	66	mJ
PD	Power Dissipation	40	W
Tj	Junction temperature	+150	°C
Tstg	Storage temperature	-55~+150	°C

- Notes: 1. Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.
2. Repetitive Rating: Pulse width limited by maximum junction temperature.
3. $L = 0.05\text{mH}$, $I_{AS} = 51\text{A}$, $V_{DD} = 25\text{V}$, $R_G = 25 \Omega$, Starting $T_J = 25^\circ\text{C}$.

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Ambient	TO-252(Note)	θ_{JA}	50	$^{\circ}\text{C/W}$
Junction to Case	TO-252	θ_{JC}	3.13	$^{\circ}\text{C/W}$

Note: Device mounted on FR-4 substrate PC board, 2oz copper, with 1inch square copper plate.

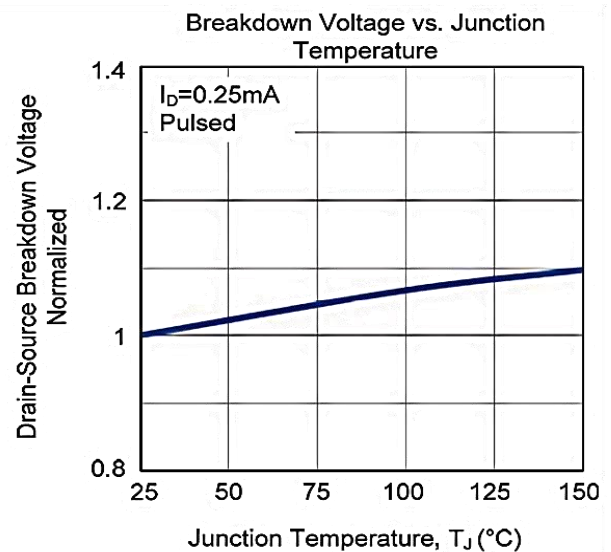
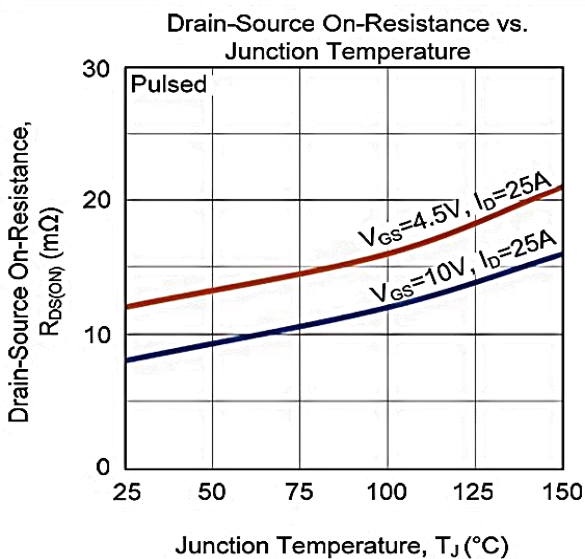
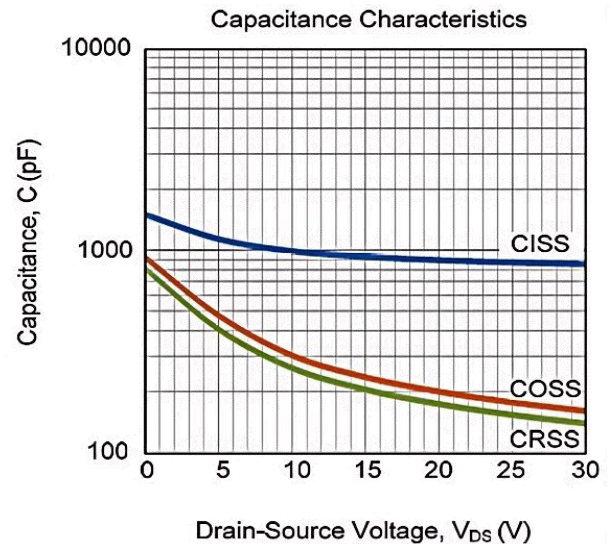
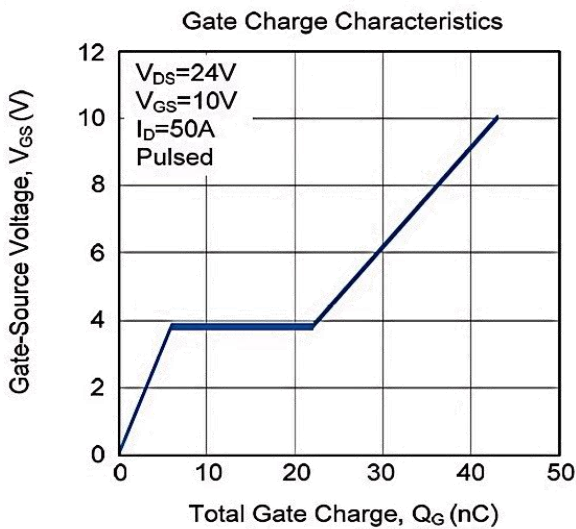
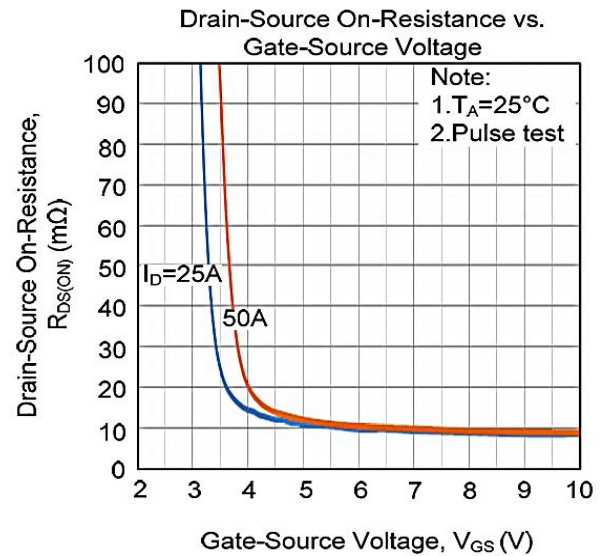
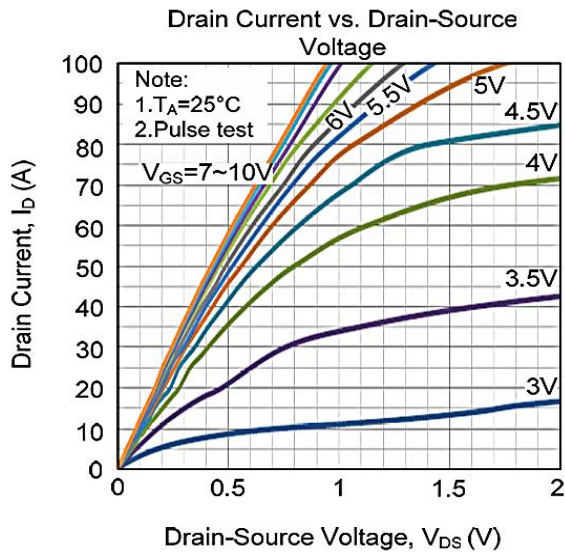
■ ELECTRICAL CHARACTERISTICS ($T_A=25^{\circ}\text{C}$, unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV _{DSS}	V _{GS} =0V, I _D =250μA	30			V
Drain-Source Leakage Current	I _{DSS}	V _{DS} =30V, V _{GS} =0V			1.5	μA
Gate- Source Leakage Current	I _{GSS}	V _{GS} =± 20V, V _{DS} =0V			± 100	nA
ON CHARACTERISTICS						
Gate Threshold Voltage	V _{GS(TH)}	V _{DS} =V _{GS} , I _D =250μA	1.0	1.7	2.5	V
Static Drain-Source On-State Resistance	R _{DS(ON)}	V _{GS} =10V, I _D =25A			10	mΩ
		V _{GS} =4.5V, I _D =25A			15	
DYNAMIC CHARACTERISTICS						
Input Capacitance	C _{ISS}	V _{DS} =15V,V _{GS} =0V f= 1.0MHz		940		pF
Output Capacitance	C _{OSS}			235		pF
Reverse Transfer Capacitance	C _{RSS}			200		pF
SWITCHING CHARACTERISTICS						
Total Gate Charge	Q _G	V _{DS} =24V, V _{GS} = 10V,I _D =50A		43		nC
Gate-Source Charge	Q _{GS}			6		nC
Gate-Drain Charge	Q _{GD}			16		nC
Turn-On Delay Time	t _{D(ON)}	V _{DS} =15V,I _D =50A,V _{GS} = 10V R _G =3Ω		8		ns
Turn-On Rise Time	t _R			17		ns
Turn-Off Delay Time	t _{D(OFF)}			25		ns
Turn-Off Fall Time	t _F			23		ns
SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS						
Maximum Continuous Drain-Source Diode Forward Current	I _S				45	A
Drain-Source Diode Forward Voltage	V _{SD}	I _S =50A,V _{GS} =0V			1.4	V
Reverse Recovery Time	t _{rr}	I _S =30A,V _{GS} =0V,dI/dt=100A/μs		164		ns
Reverse Recovery Charge	Q _{rr}			300		μC

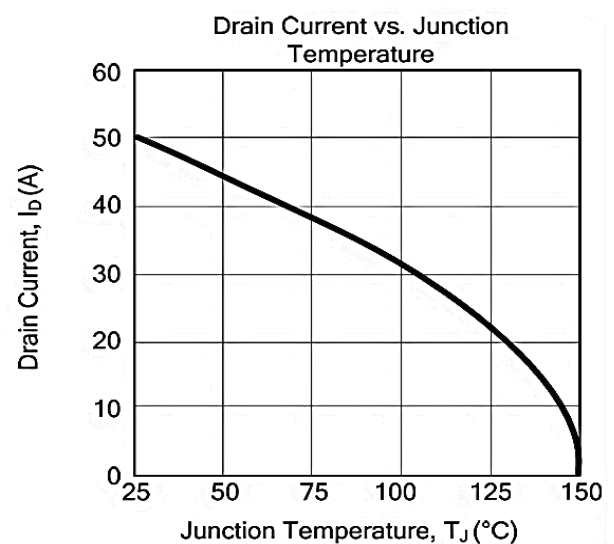
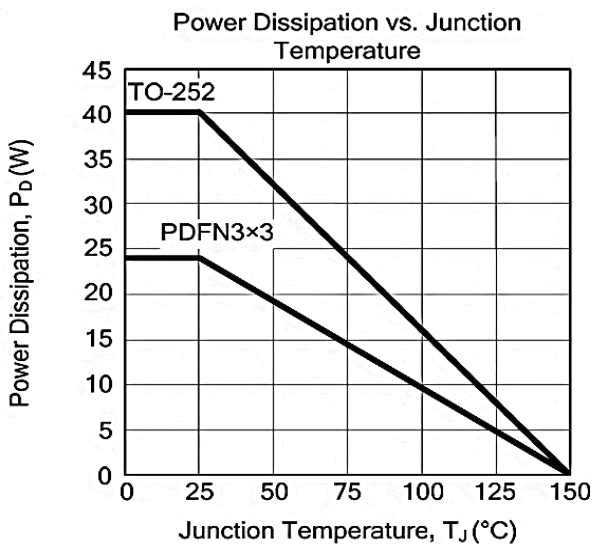
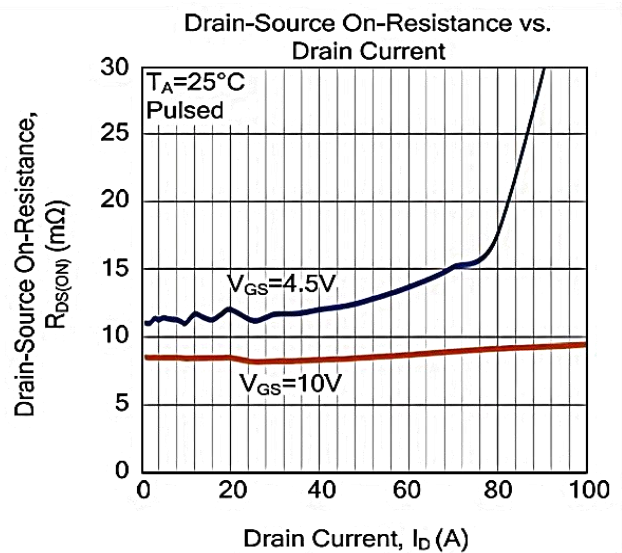
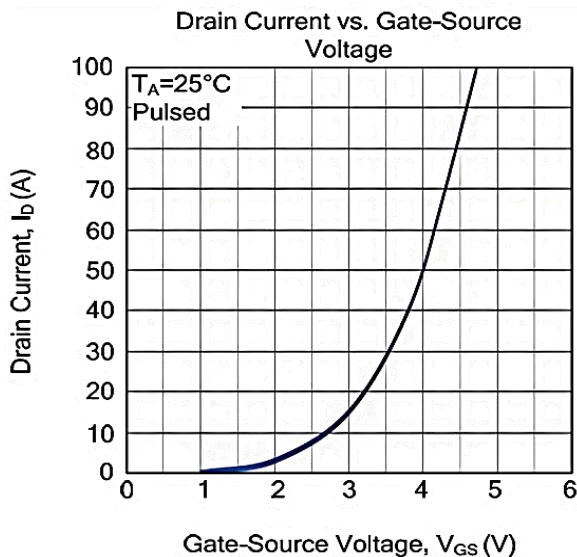
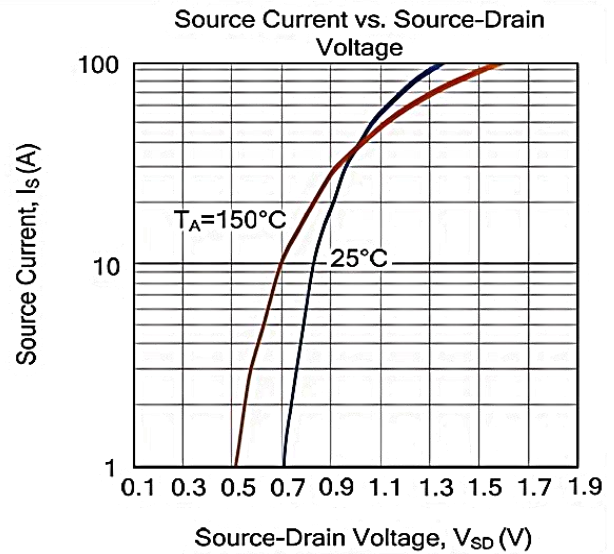
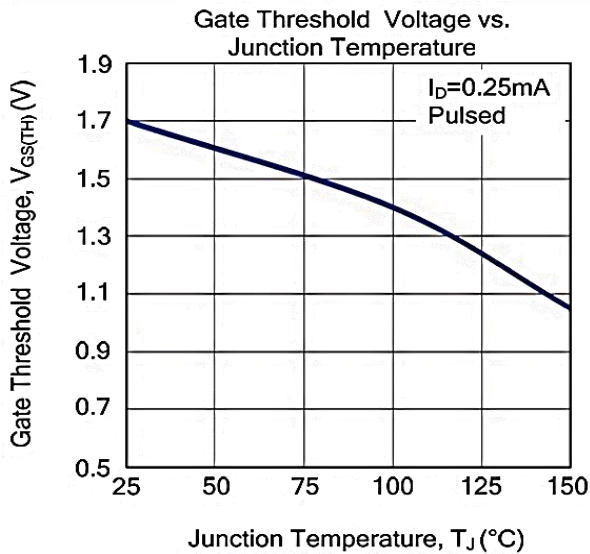
Notes:

1. Pulse width limited by $T_J(\text{MAX})$,
2. Pulse Test: Pulse Width $\leq 300\mu s$, Duty Cycle $\leq 2\%$.

■ **TYPICAL CHARACTERISTICS (1)**



■ TYPICAL CHARACTERISTICS (Con.t)



■ TYPICAL CHARACTERISTICS (Con.t)

