

**PRODUCT CHARACTERISTICS**

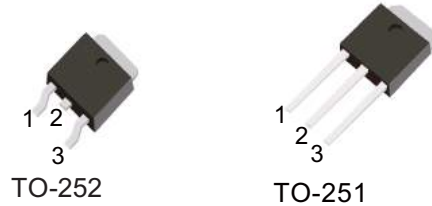
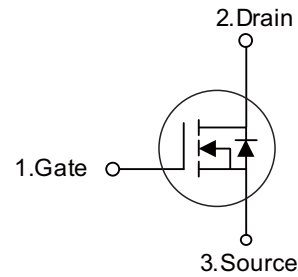
VDSS	30V
$R_{DS(on)typ}(V_{GS}=4.5V)$	4.5mΩ
$R_{DS(on)typ}(V_{GS}=10V)$	3.4mΩ
Qg@type	50nC
ID	100A

**APPLICATIONS**

- Switching applications

**FEATURES**

- $R_{DS(on)} * Q_g$  industry's benchmark
- Conduction losses reduced
- Switching losses reduced
- Low threshold device

**Symbol**

**ORDER INFORMATION**

Order codes		Package	Packing
Halogen-Free	Halogen		
N/A	MOT100N03MD	TO-252	2500 pieces /Reel
N/A	MOT100N03MC	TO-251	70 pieces /Tube

**ABSOLUTE MAXIMUM RATINGS (T<sub>C</sub> =25°C, unless otherwise specified)**

PARAMETER	SYMBOL	RATINGS	UNIT
Drain-Source Voltage	V <sub>DSS</sub>	30	V
Gate-Source Voltage	V <sub>GSS</sub>	±20	V
Continuous Drain Current	I <sub>D</sub>	100	A
Continuous Drain Current (T <sub>C</sub> =100°C)	I <sub>D</sub>	70	A
Pulsed Drain Current (Note 2)	I <sub>DM</sub>	400	A
Single Pulsed Avalanche Current (Note 3)	I <sub>AS</sub>	35	A
Single Pulsed Avalanche Energy (Note 3)	E <sub>AS</sub>	400	mJ
Power Dissipation	P <sub>D</sub>	50	W
Derate above 25°C		0.4	W/°C
Junction Temperature	T <sub>J</sub>	+175	°C
Strong Temperature	T <sub>STG</sub>	-55 ~ +175	°C

Note: 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. Pulse width limited by maximum junction temperature

3. L = 0.5mH, I<sub>AS</sub> = 30A, V<sub>DD</sub> = 25V, R<sub>G</sub> = 25Ω, Starting T<sub>J</sub> = 25°C.

**THERMAL DATA**

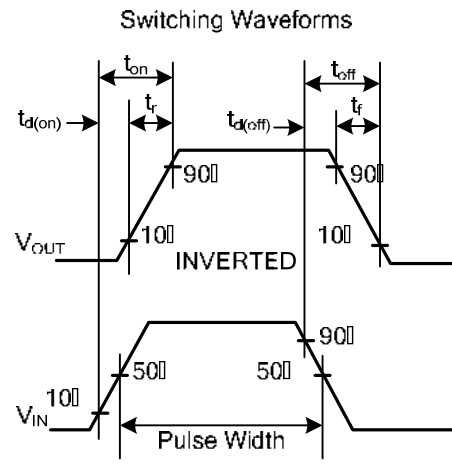
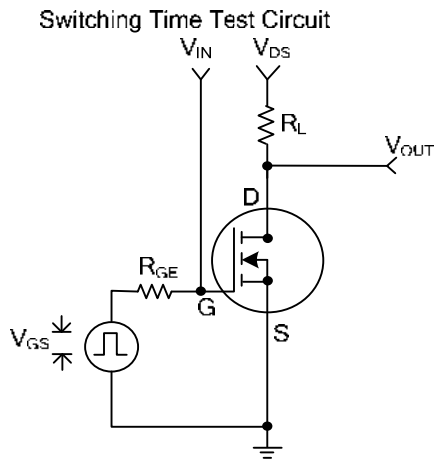
PARAMETER	SYMBOL	RATINGS	UNIT
Junction to Ambient	θ <sub>JA</sub>	110	°C/W
Junction to Case	θ <sub>JC</sub>	2.5	°C/W

**■ ELECTRICAL CHARACTERISTICS** ( $T_J = 25^\circ\text{C}$ , unless otherwise noted)

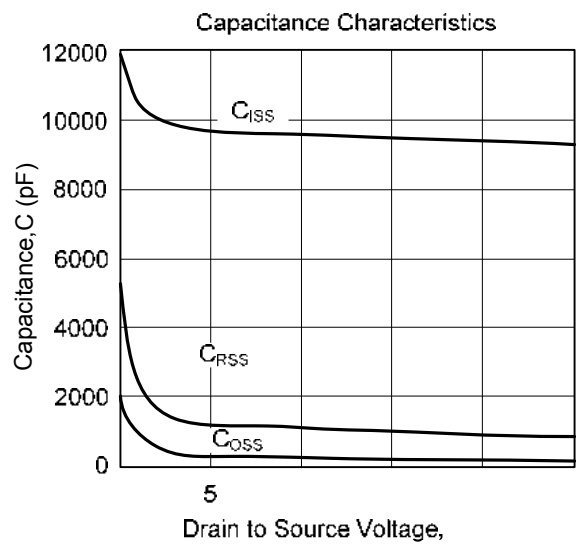
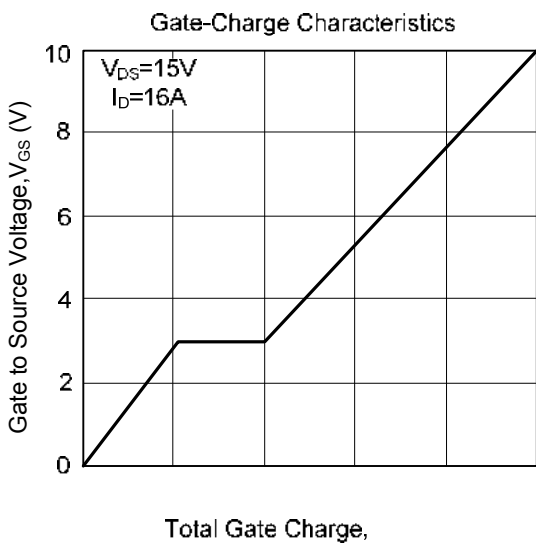
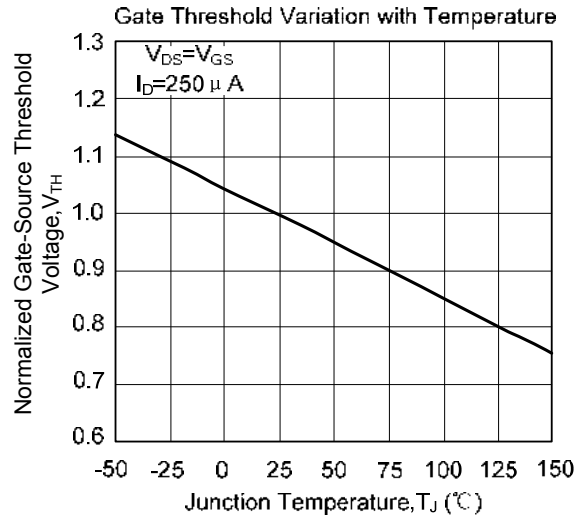
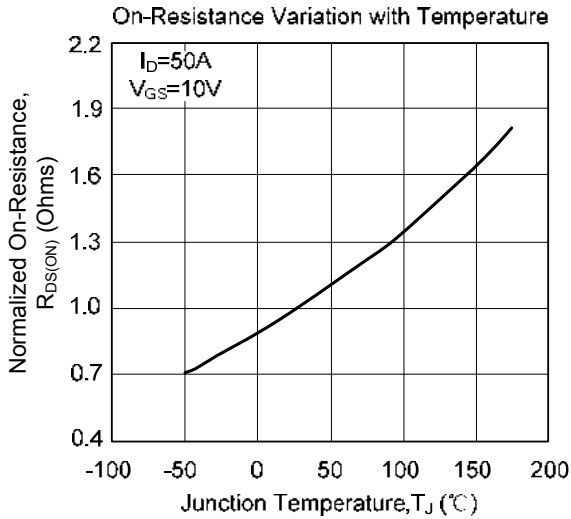
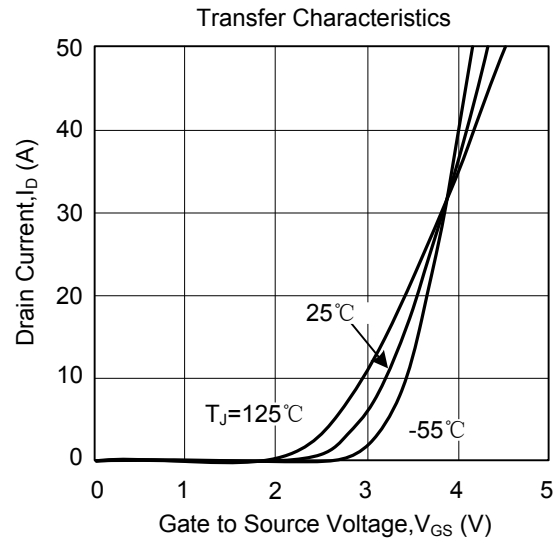
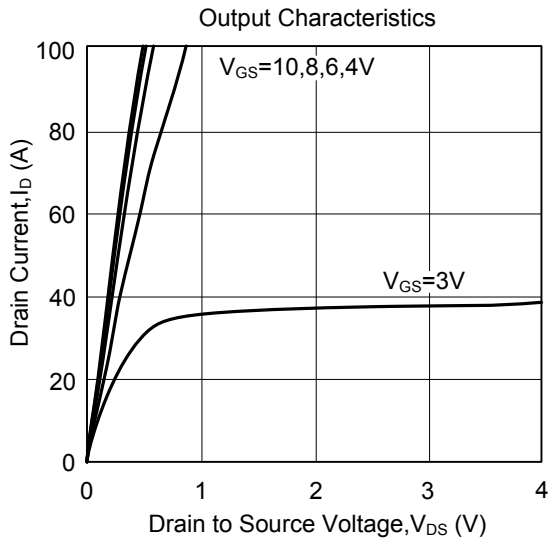
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
<b>OFF CHARACTERISTICS</b>						
Drain-Source Breakdown Voltage	$BV_{DSS}$	$V_{GS} = 0\text{ V}, I_D = 250\ \mu\text{A}$	30	-	-	V
Drain-Source Leakage Current	$I_{DSS}$	$V_{DS} = 30\text{ V}, V_{GS} = 0\text{ V}$	-	-	1	$\mu\text{A}$
Gate-Source Leakage Current	$I_{GSS}$	$V_{DS} = 0\text{ V}, V_{GS} = \pm 20\text{ V}$	-	-	$\pm 100$	nA
<b>ON CHARACTERISTICS</b> (Note2)						
Gate Threshold Voltage	$V_{GS(TH)}$	$V_{DS} = V_{GS}, I_D = 250\ \mu\text{A}$	1	-	3	V
Static Drain-Source On-Resistance	$R_{DS(ON)}$	$V_{GS} = 10\text{ V}, I_D = 20\text{ A}$	-	3.4	4.5	m $\Omega$
		$V_{GS} = 4.5\text{ V}, I_D = 20\text{ A}$	-	4.7	6	
<b>DYNAMIC PARAMETERS</b> (Note3)						
Input Capacitance	$C_{ISS}$	$V_{DS} = 15\text{ V}, V_{GS} = 0\text{ V}, f = 1.0\text{ MHz}$	-	2500	-	pF
Output Capacitance	$C_{OSS}$		-	300	-	
Reverse Transfer Capacitance	$C_{RSS}$		-	300	-	
<b>SWITCHING PARAMETERS</b> (Note3)						
Total Gate Charge	$Q_G$	$V_{DS} = 15\text{ V}, V_{GS} = 5\text{ V}, I_D = 16\text{ A}$	-	50	-	nC
Gate Source Charge	$Q_{GS}$		-	20.8	-	
Gate Drain Charge	$Q_{GD}$		-	19	-	
Turn-ON Delay Time	$t_{D(ON)}$	$V_{DD} = 15\text{ V}, I_D = 1\text{ A}, R_{GEN} = 6\ \Omega$ $V_{GS} = 10\text{ V}$	-	25.7	-	ns
Turn-ON Rise Time	$t_R$		-	10	-	
Turn-OFF Delay Time	$t_{D(OFF)}$		-	128	-	
Turn-OFF Fall-Time	$t_F$		-	34	-	
<b>SOURCE- DRAIN DIODE RATINGS AND CHARACTERISTICS</b>						
Drain-Source Diode Forward Voltage	$V_{SD}$	$I_S = 20\text{ A}, V_{GS} = 0\text{ V}$	-	-	1.5	V
Drain-Source Diode Forward Current	$I_S$		-	-	90	A

Note: 1. Pulse Test : Pulse Width < 300 $\mu\text{s}$ , Duty Cycle < 2%.  
 2. Guaranteed by design, not subject to production testing.

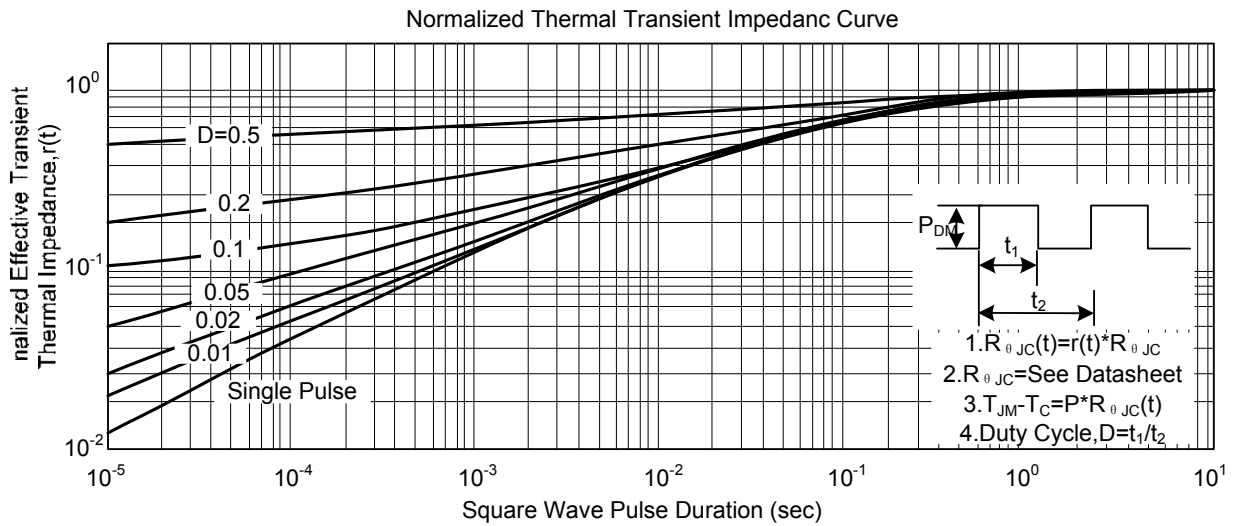
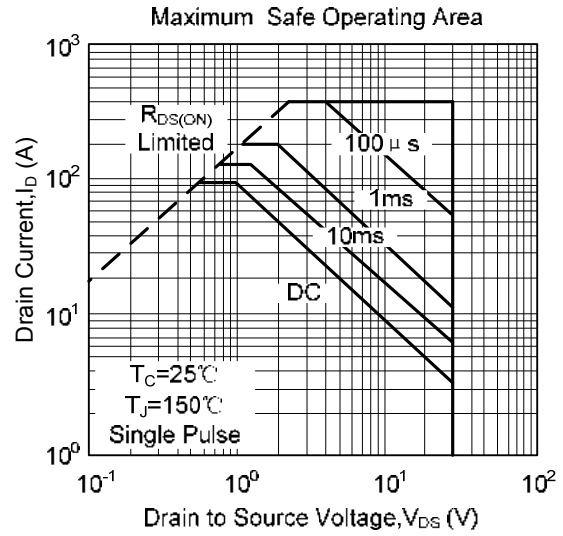
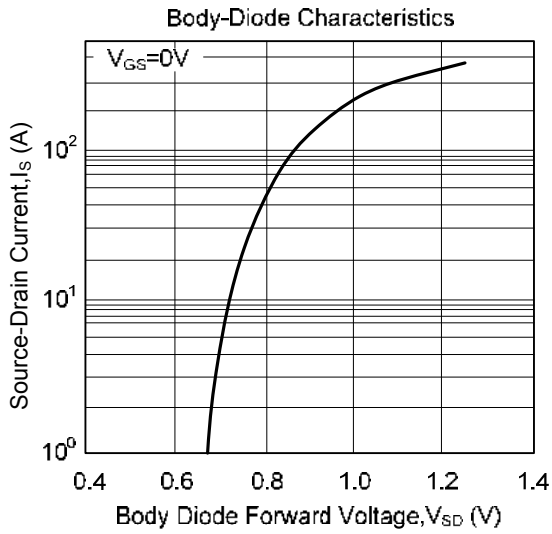
■ TEST CIRCUIT AND WAVEFORM



■ TYPICAL CHARACTERISTICS



■ TYPICAL CHARACTERISTICS(Cont.)



■ TO-251 PACKAGE OUTLINE DIMENSIONS

