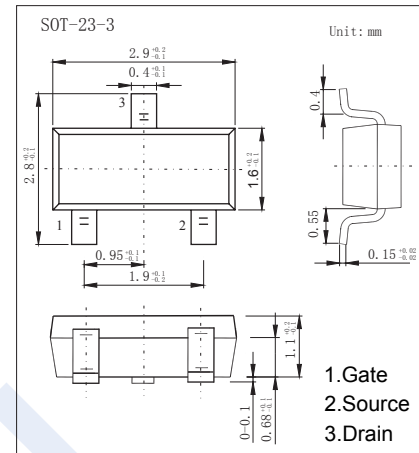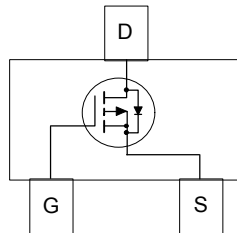## P-Channel MOSFET
NDS352AP (KDS352AP)

■ Features

● $V_{DS(V)}$ =-30V

● I_D =-0.9 A (V_{GS} =-4.5V)

● $R_{DS(ON)} < 0.3\ \Omega$ (V_{GS} =-10V)

● $R_{DS(ON)} < 0.5\ \Omega$ (V_{GS} =-4.5V)

SOT-23-3   Unit: mm

1.Gate
2.Source
3.Drain

■ Absolute Maximum Ratings Ta = 25℃

Parameter		Symbol	Rating	Unit
Drain-Source Voltage		V_{DS}	-30	V
Gate-Source Voltage		V_{GS}	±20	
Continuous Drain Current		I_D	-0.9	A
Pulsed Drain Current		I_{DM}	-10	
Power Dissipation	(Note.1)	P_D	0.5	W
	(Note.2)		0.46	
Thermal Resistance.Junction- to-Ambient		R_{thJA}	250	℃/W
Thermal Resistance.Junction- to-Case		R_{thJC}	75	
Junction Temperature		T_J	150	℃
Junction Storage Temperature Range		T_{stg}	-55 to 150	

Note.1: 250℃/W when mounted on a 0.02 in ^{2} pad of 2oz copper.

Note.2: 270℃/W when mounted on a 0.001 in ^{2} pad of 2oz copper.

P-Channel MOSFET

NDS352AP (KDS352AP)

■ Electrical Characteristics Ta = 25℃

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	V_{DSS}	I_D=-250μA, V_{GS}=0V	-30			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=-24V, V_{GS}=0V			-1	μA
		V_{DS}=-24V, V_{GS}=0V, T_J=125℃			-10	
Gate-Body leakage current	I_{GSS}	V_{DS}=0V, V_{GS}=±20V			±100	nA
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS} I_D=-250μA	-0.8	-1.7	-2.5	V
		V_{DS}=V_{GS} I_D=-250μA ,T_J=125℃	-0.5	-1.4	-2.2	
Static Drain-Source On-Resistance	$R_{DS(On)}$	V_{GS}=-4.5V, I_D=-0.9A		450	500	mΩ
		V_{GS}=-4.5V, I_D=-0.9A T_J=125℃		650	700	
		V_{GS}=-10V, I_D=-1A		250	300	
On state drain current	$I_{D(ON)}$	V_{GS}=-4.5V, V_{DS}=-5V	-2			A
Forward Transconductance	g_{FS}	V_{DS}=-5V, I_D=-0.9A		1.9		S
Input Capacitance	C_{iss}	V_{GS}=0V, V_{DS}=-15V, f=1MHz		135		pF
Output Capacitance	C_{oss}			88		
Reverse Transfer Capacitance	C_{rss}			40		
Total Gate Charge	Q_g	V_{GS}=-4.5V, V_{DS}=- 6 V, I_D=-0.9A (Note.1)		2	3	nC
Gate Source Charge	Q_{gs}			0.5		
Gate Drain Charge	Q_{gd}			1		
Turn-On DelayTime	$t_{d(on)}$	V_{GS}=-4.5V, V_{DS}=-10V, I_D=-1A,R_G=6Ω (Note.1)		5	10	ns
Turn-On Rise Time	t_r			17	30	
Turn-Off DelayTime	$t_{d(off)}$			35	70	
Turn-Off Fall Time	t_f			30	60	
Turn-On DelayTime	$t_{d(on)}$	V_{GS}=-10V, V_{DS}=-10V, I_D=-1A,R_G=50Ω (Note.1)		8	15	
Turn-On Rise Time	t_r			16	30	
Turn-Off DelayTime	$t_{d(off)}$			35	90	
Turn-Off Fall Time	t_f			30	90	
Maximum Body-Diode Continuous Current	I_S				-0.42	A
Pulsed Drain-Source Diode Forward Current	I_{SM}				-10	
Diode Forward Voltage	V_{SD}	I_S=--0.42A,V_{GS}=0V (Note.1)		-0.8	-1	V

■ Marking

Marking	352A

P-Channel MOSFET

NDS352AP (KDS352AP)
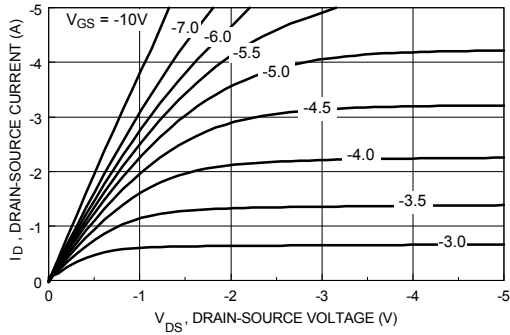
■ Typical Charactrisitics
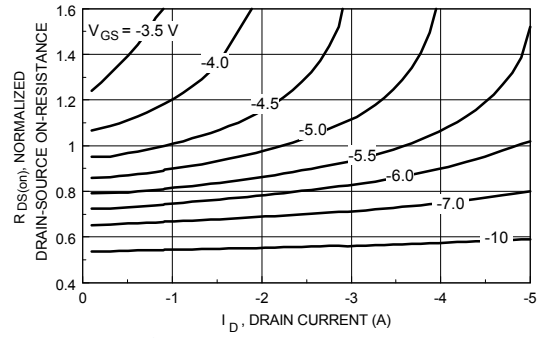

Figure 1. On-Region Characteristics.

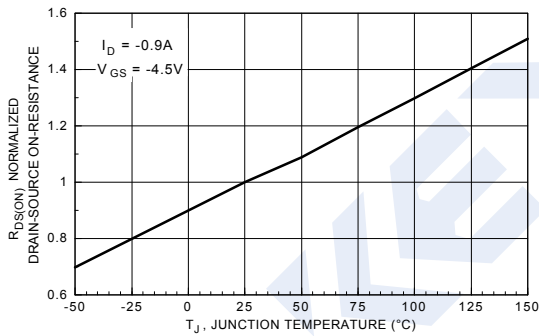**Figure 2. On-Resistance Variation with Drain Current and Gate Voltage.**

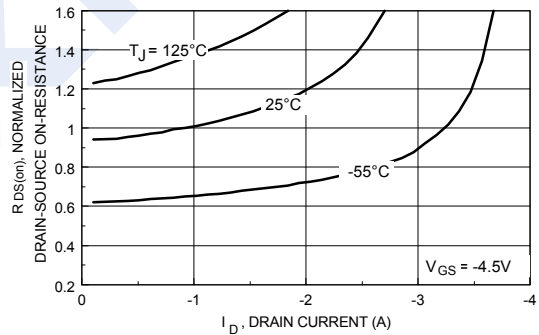**Figure 3. On-Resistance Variation with Temperature.**

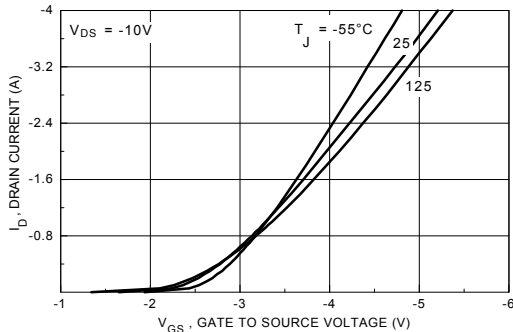**Figure 4. On-Resistance Variation with Drain Current and Temperature.**
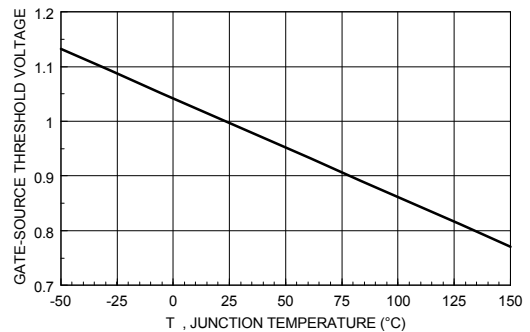

Figure 5. Transfer Characteristics.

Figure 6. Gate Threshold Variation with Temperature.
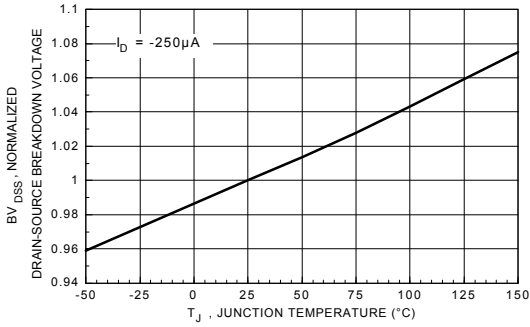
P-Channel MOSFET
NDS352AP (KDS352AP)

■ Typical Characterisitics

Figure 7. Breakdown Voltage Variation with Temperature.

Figure 8. Body Diode Forward Voltage Variation with Source Current and Temperature.

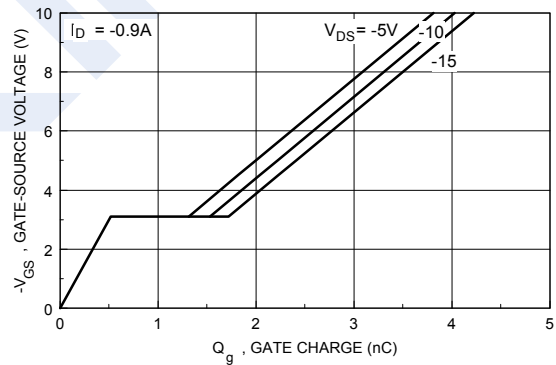Figure 9. Capacitance Characteristics.
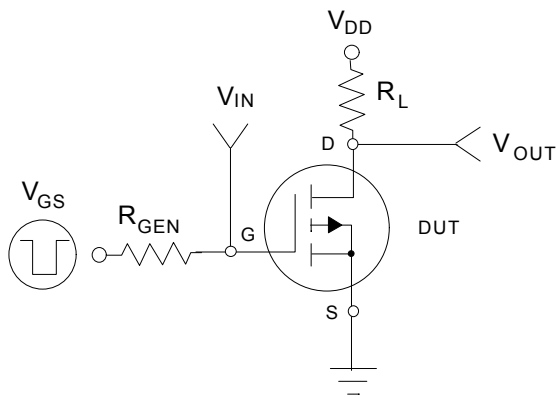

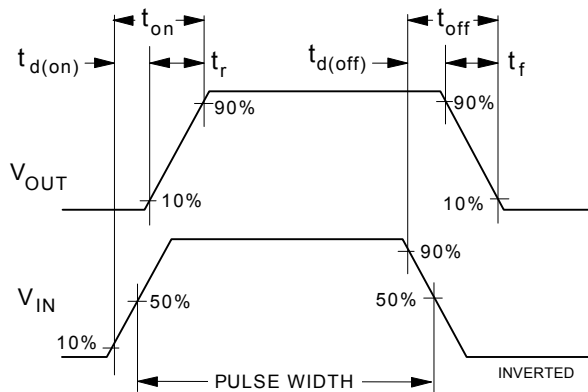Figure 10. Gate Charge Characteristics.

Figure 11. Switching Test Circuit.

Figure 12. Switching Waveforms.

P-Channel MOSFET
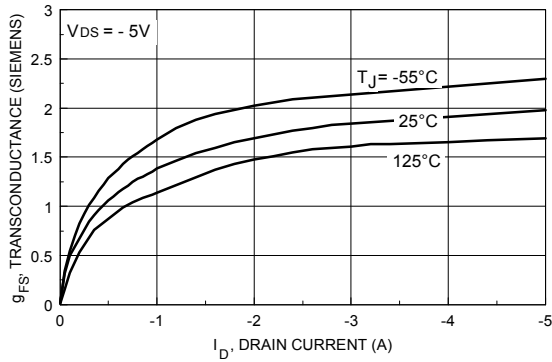## NDS352AP (KDS352AP)

■ Typical Characterisitics

Figure 13. Transconductance Variation with Drain Current and Temperature.
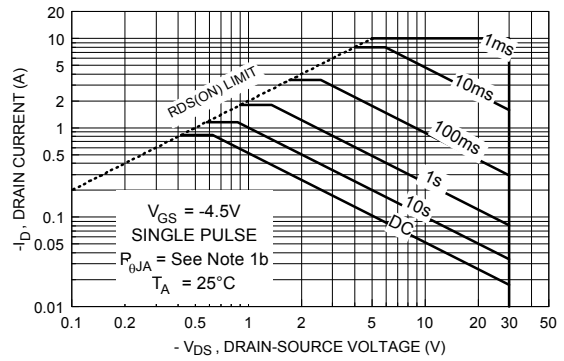

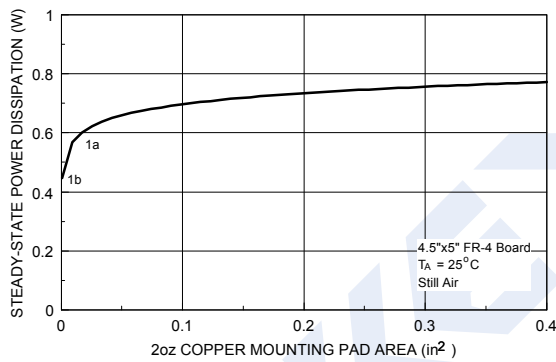Figure 14. Maximum Safe Operating Area.

Figue 15. SuperSOT™‒3 Maximum Steady-State Power Dissipation versus Copper Mounting Pad Area.
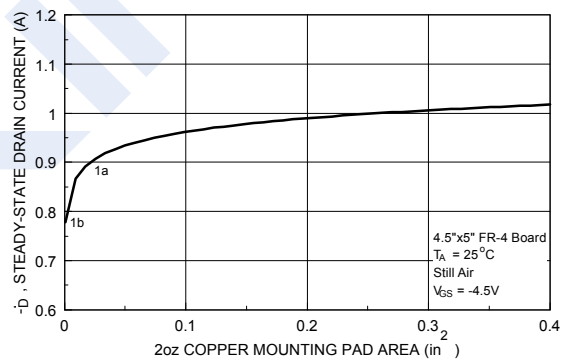

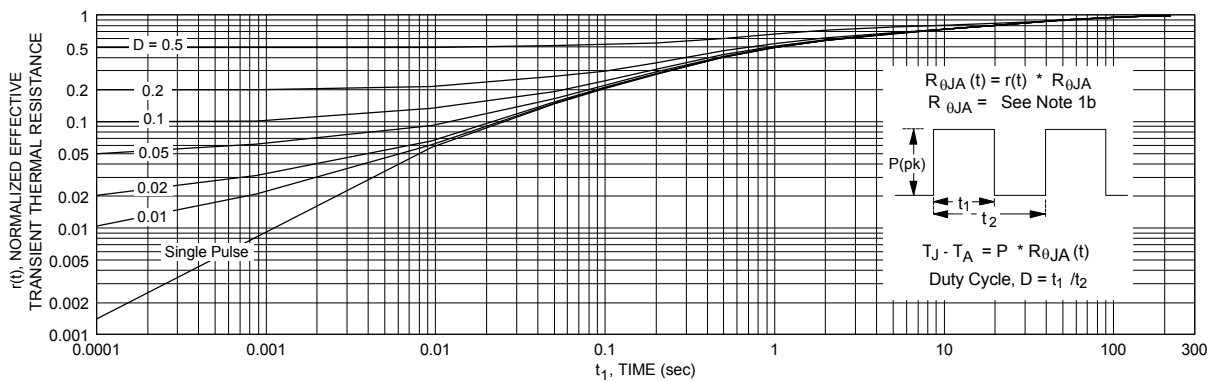Figure 16. Maximum Steady-State Drain Current versus Copper Mounting Pad Area.

Figure 17. Transient Thermal Response Curve.

Note : Characterization performed using the conditions described in note 1b. Transient thermal response will change depending on the circuit board design.